This manual is for AUCTeX (version 13.3 from 2024-01-14), a sophisticated TeX environment for Emacs.


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# Table of Contents

**Executive Summary** ........................................ 1  
**Copying** .......................................................... 2

## 1 Introduction ................................................. 3

1.1 Overview of AUCTeX .......................................... 3  
1.2 Installing AUCTeX ........................................... 4

1.2.1 Prerequisites ................................................. 4  
1.2.2 Configure .......................................................... 5  
1.2.3 Build/install and uninstall .................................... 7  
1.2.4 Loading the package .......................................... 7  
1.2.5 Providing AUCTeX as a package .............................. 8  
1.2.6 Installation for non-privileged users ........................ 9

1.2.6.1 Using AUCTeX from local Git repo ....................... 10  
1.2.7 Installation under MS Windows .............................. 10  
1.2.8 Customizing .................................................... 15

1.3 Quick Start .................................................... 15

1.3.1 Functions for editing TeX files .............................. 16

1.3.1.1 Making your TeX code more readable ........................ 16  
1.3.1.2 Entering sectioning commands ............................. 16  
1.3.1.3 Inserting environments ..................................... 17  
1.3.1.4 Inserting macros .......................................... 17  
1.3.1.5 Changing the font ......................................... 17  
1.3.1.6 Other useful features ..................................... 18  
1.3.2 Creating and viewing output, debugging ................. 18

1.3.2.1 One Command for \LaTeX, helpers, viewers, and printing .. 18  
1.3.2.2 Choosing an output format .................................. 18  
1.3.2.3 Debugging \LaTeX ........................................... 19  
1.3.2.4 Running \LaTeX on parts of your document ............ 19

## 2 Editing the Document Source ............................... 20

2.1 Insertion of Quotes, Dollars, and Braces ................. 20  
2.2 Inserting Font Specifiers ..................................... 23  
2.3 Inserting chapters, sections, etc. ........................... 24  
2.4 Inserting Environment Templates ............................. 26

2.4.1 Equations ..................................................... 28  
2.4.2 Floats ............................................................ 29  
2.4.3 Itemize-like Environments .................................. 29  
2.4.4 Tabular-like Environments .................................. 30  
2.4.5 Customizing Environments .................................. 30  
2.5 Entering Mathematics .......................................... 30  
2.6 Completion ....................................................... 32
2.7 Marking Environments, Sections, or Texinfo Nodes ............... 34
2.7.1 LaTeX Commands for Marking Environments and Sections . . 34
2.7.2 Texinfo Commands for Marking Environments and Sections . . 35
2.8 Commenting .............................................. 35
2.9 Indenting .................................................. 36
2.10 Filling .................................................... 39

3 Controlling Screen Display .................................... 42
3.1 Font Locking ................................................ 42
3.1.1 Fontification of macros .................................. 43
3.1.2 Fontification of quotes ................................... 46
3.1.3 Fontification of mathematical constructs .................... 47
3.1.4 Verbatim macros and environments ....................... 48
3.1.5 Faces used by font-latex ................................ 48
3.1.6 Known fontification problems ............................ 48
3.2 Folding Macros and Environments ............................ 49
3.3 Outlining the Document .................................... 52
3.4 Narrowing ................................................... 53
3.5 Prettifying ................................................... 53

4 Starting Processors, Viewers and Other Programs ................. 54
4.1 Executing Commands ........................................ 54
4.1.1 Starting a Command on a Document or Region ............. 54
4.1.2 Selecting and Executing a Command ........................ 56
4.1.3 Options for TEX Processors ............................... 59
4.2 Viewing the Formatted Output ............................... 62
4.2.1 Starting Viewers .......................................... 62
4.2.2 Forward and Inverse Search ................................ 64
4.3 Catching the errors .......................................... 66
4.3.1 Controlling warnings to be reported ....................... 67
4.3.2 List of all errors and warnings ............................ 67
4.4 Checking for problems ....................................... 68
4.5 Controlling the output ....................................... 69
4.6 Cleaning intermediate and output files ......................... 69
4.7 Documentation about macros and packages .................... 70

5 Customization and Extension .................................... 71
5.1 Modes and Hooks ............................................ 71
5.2 Multifile Documents ........................................ 71
5.3 Automatic Parsing of TEX Files ............................. 73
5.4 Language Support ............................................ 75
5.4.1 Using AUCTEX with European Languages ............... 75
5.4.1.1 Typing and Displaying Non-ASCII Characters ....... 75
5.4.1.2 Style Files for Different Languages ................ 76
5.4.2 Using AUCTeX with Japanese TeX ....................... 78
5.5 Automatic Customization ........................................ 80
  5.5.1 Automatic Customization for the Site ................... 81
  5.5.2 Automatic Customization for a User ................... 81
  5.5.3 Automatic Customization for a Directory ........... 82
5.6 Writing Your Own Style Support .............................. 82
  5.6.1 A Simple Style File ........................................ 82
  5.6.2 Adding Support for Macros ................................. 84
  5.6.3 Adding Support for Environments ....................... 88
  5.6.4 Adding or Examining Other Information ............... 90
    5.6.4.1 Adding bibliographies in style hooks ............ 90
    5.6.4.2 Examining Package/Class Options ................. 91
    5.6.4.3 Adding Support for Option Completion .......... 91
  5.6.5 Automatic Extraction of New Things ................. 92

Appendix A Copying, Changes, Development, FAQ, Texinfo Mode .................................. 95
  A.1 Copying this Manual ........................................... 95
    A.1.1 GNU Free Documentation License ....................... 95
  A.2 Changes and New Features ..................................... 102
  A.3 Future Development ............................................ 121
    A.3.1 Mid-term Goals .......................................... 122
    A.3.2 Wishlist ................................................. 123
    A.3.3 Bugs .................................................... 125
  A.4 Frequently Asked Questions ................................. 125
  A.5 Features specific to AUCTeX’s Texinfo major mode ........ 127
    A.5.1 How AUCTeX and the native mode work together .... 127
    A.5.2 Where the native mode is superseded ............... 127
    A.5.3 Where key bindings are mapped to the native mode .. 129
    A.5.4 Which native mode key bindings are missing ....... 129

Indices ................................................................. 131
  Key Index .......................................................... 131
  Function Index ................................................... 132
  Variable Index ................................................... 133
  Concept Index ................................................... 136
Executive Summary

AUCTeX is an integrated environment for editing \LaTeX{}, ConTEXT, docTEX, Texinfo, and \TeX{} files.

Although AUCTeX contains a large number of features, there are no reasons to despair. You can continue to write \TeX{} and \LaTeX{} documents the way you are used to, and only start using the multiple features in small steps. AUCTeX is not monolithic, each feature described in this manual is useful by itself, but together they provide an environment where you will make very few \LaTeX{} errors, and makes it easy to find the errors that may slip through anyway.

It is a good idea to make a printout of AUCTeX’s reference card \texttt{tex-ref.tex} or one of its typeset versions.

If you want to make AUCTeX aware of style files and multifile documents right away, insert the following in your init file (usually ~/.emacs.d/init.el).

\begin{verbatim}
(setq TeX-auto-save t)
(setq TeX-parse-self t)
(setq-default TeX-master nil)
\end{verbatim}

Another thing you should enable is Ref\TeX{}, a comprehensive solution for managing cross references, bibliographies, indices, document navigation and a few other things. (See Section “Installation” in The Ref\TeX{} manual.)

For detailed information about the \texttt{preview-latex} subsystem of AUCTeX, see Section “Introduction” in The \texttt{preview-latex} Manual.

There is a mailing list for general discussion about AUCTeX: write a mail with “subscribe” in the subject to \texttt{auctex-request@gnu.org} to join it. Send contributions to \texttt{auctex@gnu.org}.

Bug reports should go to \texttt{bug-auctex@gnu.org}, suggestions for new features, and pleas for help should go to either \texttt{auctex-devel@gnu.org} (the AUCTeX developers), or to \texttt{auctex@gnu.org} if they might have general interest. Please use the command \texttt{\texttt{M-x TeX-submit-bug-report RET}} to report bugs if possible. You can subscribe to a low-volume announcement list by sending “subscribe” in the subject of a mail to \texttt{info-auctex-request@gnu.org}.
Copying

AUCTeX primarily consists of Lisp files for Emacs, but there are also installation scripts and files and TeX support files. All of those are free; this means that everyone is free to use them and free to redistribute them on a free basis. The files of AUCTeX are not in the public domain; they are copyrighted and there are restrictions on their distribution, but these restrictions are designed to permit everything that a good cooperating citizen would want to do. What is not allowed is to try to prevent others from further sharing any version of these programs that they might get from you.

Specifically, we want to make sure that you have the right to give away copies of the files that constitute AUCTeX, that you receive source code or else can get it if you want it, that you can change these files or use pieces of them in new free programs, and that you know you can do these things.

To make sure that everyone has such rights, we have to forbid you to deprive anyone else of these rights. For example, if you distribute copies of parts of AUCTeX, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must tell them their rights.

Also, for our own protection, we must make certain that everyone finds out that there is no warranty for AUCTeX. If any parts are modified by someone else and passed on, we want their recipients to know that what they have is not what we distributed, so that any problems introduced by others will not reflect on our reputation.

The precise conditions of the licenses for the files currently being distributed as part of AUCTeX are found in the General Public Licenses that accompany them. This manual specifically is covered by the GNU Free Documentation License (see Section A.1 [Copying this Manual], page 95).
1 Introduction

1.1 Overview of AUCTeX

AUCTeX is a comprehensive customizable integrated environment for writing input files for \TeX{}, \LaTeX{}, Con\TeX{}t, Texinfo, and doc\TeX{} using Emacs.

It supports you in the insertion of macros, environments, and sectioning commands by providing completion alternatives and prompting for parameters. It automatically indents your text as you type it and lets you format a whole file at once. The outlining and folding facilities provide you with a focused and clean view of your text.

AUCTeX lets you process your source files by running \TeX{} and related tools (such as output filters, post processors for generating indices and bibliographies, and viewers) from inside Emacs. AUCTeX lets you browse through the errors \TeX{} reported, while it moves the cursor directly to the reported error, and displays some documentation for that particular error. This will even work when the document is spread over several files.

One component of AUCTeX that \LaTeX{} users will find attractive is `preview-latex`, a combination of folding and in-source previewing that provides true “What You See Is What You Get” experience in your sourcebuffer, while letting you retain full control.

More detailed information about the features and usage of AUCTeX can be found in the remainder of this manual.

AUCTeX is written entirely in Emacs Lisp, and hence you can easily add new features for your own needs. It is a GNU project and distributed under the ‘GNU General Public License Version 3’.

The most recent version is always available at https://ftp.gnu.org/pub/gnu/auctex/.

WWW users may want to check out the AUCTeX page at https://www.gnu.org/software/auctex/.

For comprehensive information about how to install AUCTeX See Section 1.2 [Installation], page 4, or Section 1.2.7 [Installation under MS Windows], page 10, respectively.

If you are considering upgrading AUCTeX, the recent changes are described in Section A.2 [Changes], page 102.

If you want to discuss AUCTeX with other users or its developers, there are several mailing lists you can use.

Send a mail with the subject “subscribe” to auctex-request@gnu.org in order to join the general discussion list for AUCTeX. Articles should be sent to auctex@gnu.org. In a similar way, you can subscribe to the info-auctex@gnu.org list for just getting important announcements about AUCTeX. The list bug-auctex@gnu.org is for bug reports which you should usually file with the \texttt{M-x TeX-submit-bug-report RET} command. If you want to address the developers of AUCTeX themselves with technical issues, they can be found on the discussion list auctex-devel@gnu.org.
1.2 Installing AUCTeX

The modern and strongly recommended way of installing AUCTeX is by using the Emacs package manager integrated in Emacs 24 and greater (ELPA). Simply do \texttt{M-x list-packages RET}, mark the auctex package for installation with \texttt{i}, and hit \texttt{x} to execute the installation procedure. That’s all.

\texttt{use-package} users can use this simple recipe in their \texttt{user-init-file} which essentially does the same as the manual installation explained above.

\begin{verbatim}
(use-package tex
  :ensure auctex)
\end{verbatim}

Using the ELPA version has several advantages. Besides being platform and OS independent, you will receive intermediate bugfix releases between major AUCTeX releases conveniently. For past ELPA releases, see \url{https://elpa.gnu.org/packages/auctex.html}. Once the installation is completed, you can skip the rest of this section and proceed to Section 1.3 [Quick Start], page 15.

The remainder of this section is about installing AUCTeX from a release tarball or from a checkout of the AUCTeX repository.

Installing AUCTeX should be simple: merely \texttt{./configure, make, and make install} for a standard site-wide installation (most other installations can be done by specifying a \texttt{--prefix=...} option).

On many systems, this will already activate the package, making its modes the default instead of the built-in modes of Emacs. If this is not the case, consult Section 1.2.4 [Loading the package], page 7. Please read through this document fully before installing anything. The installation procedure has changed as compared to earlier versions. Users of MS Windows are asked to consult See Section 1.2.7 [Installation under MS Windows], page 10.

1.2.1 Prerequisites

- GNU Emacs 26.1 or higher
  
  Using \texttt{preview-latex} requires a version of Emacs compiled with image support.

  \textbf{Windows} Precompiled versions are available from \url{https://ftp.gnu.org/gnu/emacs/windows/}.

  \textbf{macOS} For an overview of precompiled versions of Emacs for macOS see for example \url{https://www.emacswiki.org/emacs/EmacsForMacOS}.

  \textbf{GNU/Linux} Most GNU/Linux distributions nowadays provide a recent variant of Emacs via their package repositories.

  \textbf{Self-compiled} Compiling Emacs yourself requires a C compiler and a number of tools and development libraries. Details are beyond the scope of this manual. Instructions for checking out the source code can be found at \url{https://savannah.gnu.org/git/?group=emacs}. 

• A working \TeX{} installation

Well, AUCTeX would be pointless without that. Processing documentation requires \TeX{}, \LaTeX{} and Texinfo during installation. \texttt{preview-latex} requires Dvips or \texttt{dvipng} for its operation in DVI mode. The default configuration of AUCTeX is tailored for \TeX{} Live-based distributions, but can be adapted easily.

• A recent Ghostscript

This is needed for operation of \texttt{preview-latex} in both DVI and PDF mode. Ghostscript version 7.07 or newer is required.

• GNU make

Recent AUCTeX uses GNU make specific capabilities in the Makefiles. If your OS's default make command is not GNU make, you have to obtain it in order to build AUCTeX by yourself. GNU make is sometimes provided under the name \texttt{gmake} in your OS's binary package system.

• The Texinfo package

Strictly speaking, you can get away without it if you are building from the distribution tarball, have not modified any files and don’t need a printed version of the manual: the pregenerated info file is included in the tarball. At least version 4.0 is required.

For some known issues with various software, see Section “Known problems” in the \texttt{preview-latex} manual.

1.2.2 Configure

The first step is to configure the source code, telling it where various files will be. To do so, run

\texttt{./configure options}

(Note: if you have fetched AUCTeX from Git rather than a regular release, you will have to first follow the instructions in \texttt{README.GIT}).

On many machines, you will not need to specify any options, but if \texttt{configure} cannot determine something on its own, you’ll need to help it out with one of these options:

\texttt{--prefix=prefix}

All automatic placements for package components will be chosen from sensible existing hierarchies below this: directories like \texttt{man}, \texttt{share} and \texttt{bin} are supposed to be directly below \texttt{prefix}.

Only if no workable placement can be found there, in some cases an alternative search will be made in a prefix deduced from a suitable binary. \texttt{/usr/local} is the default \texttt{prefix}, intended to be suitable for a site-wide installation. If you are packaging this as an operating system component for distribution, the setting \texttt{/usr} will probably be the right choice. See Section 1.2.5 [Advice for package providers], page 8, for detail.

If you are planning to install the package as a single non-priviledged user, you will typically set \texttt{prefix} to your home directory. Consult Section 1.2.6 [Advice for non-priviledged users], page 9, for additional instructions.

\texttt{--with-emacs=/path/to/emacs}

If you are using a pretest which isn’t in your \texttt{PATH}, or \texttt{configure} is not finding the right Emacs executable, you can specify it with this option.
--with-lispdir=lispdir
This option specifies the location of the site-lisp directory within load-path under which the files will get installed (the bulk will get installed in a subdirectory). ./configure should figure this out by itself.

--with-auctexstartfile=auctex.el
--with-previewstartfile=preview-latex.el
This is the name of the respective startup files. If lispdir contains a subdirectory site-start.d, the start files are placed there, and site-start.el should load them automatically. Please be aware that you must not move the start files after installation since other files are found relative to them.

--with-packagelispdir=auctex
This is the directory where the bulk of the package gets located. The startfile adds this into load-path.

--with-auto-dir=/dir
You can use this option to specify the directory containing automatically generated information by M-x TeX-auto-generate-global RET. It is not necessary for most TEx installs, but may be used if you don’t like the directory that configure is suggesting.

--help
This is not an option specific to AUCTeX. A number of standard options to configure exist, and we do not have the room to describe them here; a short description of each is available, using --help.

--disable-preview
This disables configuration and installation of preview-latex. This option is not actually recommended. If your Emacs does not support images, you should really upgrade to a newer version. Distributors should, if possible, refrain from distributing AUCTeX and preview-latex separately in order to avoid confusion and upgrade hassles if users install partial packages on their own.

--with-texmf-dir=/dir
--without-texmf-dir
This option is used for specifying a TDS-compliant directory hierarchy. Using --with-texmf-dir=/dir you can specify where the TEx TDS directory hierarchy resides, and the TEx files will get installed in /dir/tex/latex/preview/.
If you use the --without-texmf-dir option, the TEx-related files will be kept in the Emacs Lisp tree, and at runtime the TEXINPUTS environment variable will be made to point there. You can install those files into your own TEx tree at some later time with M-x preview-install-styles RET.

--with-tex-dir=/dir
If you want to specify an exact directory for the preview TEx files, use --with-tex-dir=/dir. In this case, the files will be placed in /dir, and you’ll also need the following option:

--with-doc-dir=/dir
This option may be used to specify where the TEx documentation goes. It is to be used when you are using --with-tex-dir=/dir, but is normally not necessary otherwise.
1.2.3 Build/install and uninstall

Once configure has been run, simply enter

```
make
```

at the prompt to byte-compile the lisp files, extract the \TeX files and build the documentation files. To install the files into the locations chosen earlier, type

```
make install
```

You may need special privileges to install, e.g., if you are installing into system directories.

Should you want to completely remove the installed package, in the same directory you built AUCTeX run

```
make uninstall
```

You will need administration privileges if you installed the package into system directories.

1.2.4 Loading the package

You can detect the successful activation of AUCTeX and preview-latex in the menus after loading a \LaTeX file like `circ.tex': AUCTeX then gives you a ‘Command’ menu, and preview-latex gives you a ‘Preview’ menu.

With Emacs (or if you explicitly disabled use of the package system), the startup files `auctex.el' and `preview-latex.el' may already be in a directory of the `site-start.d/' variety if your Emacs installation provides it. In that case they should be automatically loaded on startup and nothing else needs to be done. If not, they should at least have been placed somewhere in your `load-path'. You can then load them by placing the lines

```
(lload "auctex.el" nil t t)
(load "preview-latex.el" nil t t)
```

into your init file such as `init.el' or `.emacs'.

If you explicitly used `--with-lispdir', you may need to add the specified directory into Emacs’ `load-path' variable by adding something like

```
(add-to-list 'load-path "~/elisp")
```

before the above lines into your Emacs startup file.

For site-wide activation in GNU Emacs, see Section 1.2.5 [Advice for package providers], page 8.

Once activated, the modes provided by AUCTeX are used per default for all supported file types. If you want to change the modes for which it is operative instead of the default, use

```
M-x customize-option RET TeX-modes RET
```

If you want to remove a preinstalled AUCTeX completely before any of its modes have been used,

```
(unload-feature 'tex-site)
```

should accomplish that.
1.2.5 Providing AUCTeX as a package

As a package provider, you should make sure that your users will be served best according to their intentions, and keep in mind that a system might be used by more than one user, with different preferences.

There are people that prefer the built-in Emacs modes for editing TeX files, in particular plain TeX users. There are various ways to tell AUCTeX even after auto-activation that it should not get used, and they are described in Chapter 1 [Introduction to AUCTeX], page 3.

So if you have users that don’t want to use the preinstalled AUCTeX, they can easily get rid of it. Activating AUCTeX by default is therefore a good choice.

If the installation procedure did not achieve this already by placing auctex.el and preview-latex.el into a possibly existing site-start.d directory, you can do this by placing

```
(load "auctex.el" nil t t)
(load "preview-latex.el" nil t t)
```

in the system-wide site-start.el.

The --without-texmf-dir option can be convenient for systems that are intended to support more than a single TeX distribution. Since more often than not TeX packages for operating system distributions are either much more outdated or much less complete than separately provided systems like TeX Live, this method may be generally preferable when providing packages.

The following package structure would be adequate for a typical fully supported Unix-like installation:

`preview-tetex`
Style files and documentation for preview.sty, placed into a TeX tree where it is accessible from the tetex executables usually delivered with a system. If there are other commonly used TeX system packages, it might be appropriate to provide separate packages for those.

`auctex-emacs-tetex`
This package will require the installation of `preview-tetex` and will record in TeX-macro-global where to find the TeX tree. It is also a good idea to run

```
emacs -batch -f TeX-auto-generate-global
```

when either AUCTeX or tetex get installed or upgraded. If your users might want to work with a different TeX distribution (nowadays pretty common), instead consider the following:

`auctex-emacs`
This package will be compiled with --without-texmf-dir and will consequently contain the `preview` style files in its private directory. It will probably not be possible to initialize TeX-macro-global to a sensible value, so running TeX-auto-generate-global does not appear useful. This package would neither conflict with nor provide `preview-tetex`. 
1.2.6 Installation for non-privileged users

Often people without system administration privileges want to install software for their private use. In that case you need to pass more options to the `configure` script.

The main expedient is using the `--prefix` option to the `configure` script, and let it point to the personal home directory. In that way, resulting binaries will be installed under the `bin` subdirectory of your home directory, manual pages under `man` and so on. It is reasonably easy to maintain a bunch of personal software, since the prefix argument is supported by most `configure` scripts.

You often need to specify `--with-lispdir` option as well. If you haven’t installed Emacs under your home directory and use Emacs installed in system directories, the `configure` script might not be able to figure out suitable place to install lisp files under your home directory. In that case, the `configure` script would silently choose, by default, the `site-lisp` directory within `load-path` for the place, where administration privileges are usually required to put relevant files. Thus you will have to tell the `configure` script explicitly where to put those files by, e.g., `--with-lispdir=/home/myself/share/emacs/site-lisp`.

You’ll have to add something like ‘/home/myself/share/emacs/site-lisp’ to your `load-path` variable, if it isn’t there already.

In addition, you will have to tell `configure` script where to install TeX-related files such as `preview.sty` if `preview-latex` isn’t disabled. It is enough to specify `--with-texmf-dir=$HOME/texmf` for most typical cases, but you have to create the directory `$HOME/texmf` in advance if it doesn’t exist. If this prescription doesn’t work, consider using one or more of the options `--with-texmf-dir=dir`, `--without-texmf-dir`, `--with-tex-dir=dir` and `--with-doc-dir=dir`. See Section 1.2.2 [Configure], page 5, for detail of these options.

Now here is another thing to ponder: perhaps you want to make it easy for other users to share parts of your personal Emacs configuration. In general, you can do this by writing ‘~myself/’ anywhere where you specify paths to something installed in your personal subdirectories, not merely ‘~/’, since the latter, when used by other users, will point to non-existent files.

For yourself, it will do to manipulate environment variables in your `.profile` resp. `.login` files. But if people will be copying just Elisp files, their copies will not work. While it would in general be preferable if the added components where available from a shell level, too (like when you call the standalone info reader, or try using `preview.sty` for functionality besides of Emacs previews), it will be a big help already if things work from inside of Emacs.

Here is how to do the various parts:

**Making the Elisp available**

In GNU Emacs, it should be sufficient if people just do

```lisp
(load "~myself/share/emacs/site-lisp/auctex.el" nil t t)
(load "~myself/share/emacs/site-lisp/preview-latex.el" nil t t)
```

where the path points to your personal installation. The rest of the package should be found relative from there without further ado.
Making the Info files available

For making the info files accessible from within Elisp, something like the following might be convenient to add into your or other people’s startup files:

```
(eval-after-load 'info
  '(add-to-list 'Info-directory-list "~myself/info"))
```

Making the \LaTeX{} style available

If you want others to be able to share your installation, you should configure it using `--without-texmf-dir`, in which case things should work as well for them as for you.

1.2.6.1 Using AUCTeX from local Git repo

With the techniques described above, it is also possible to use AUCTeX directly from a local Git repository. Let’s assume you have your Git repositories under ‘~/development/’.

First, you have to fetch a copy of the AUCTeX Git repository. In a shell, change directory to ‘~/development/’ and do:

```
git clone https://git.savannah.gnu.org/git/auctex.git
```

Now change directory to ‘~/development/auctex’ and run ‘./autogen.sh’. Next thing is to run configure like this:

```
./configure --without-texmf-dir --with-lispdir=
```

When finished, simply enter

```
make
```

and you’re finished. Note that the ‘make install’ step is not necessary.

Now you have to tell Emacs about the plan. The following variables must be set in your init file because their normal values are only correct when AUCTeX is installed:

```
(setq TeX-data-directory "~/development/auctex"
     TeX-lisp-directory TeX-data-directory)
```

The info files will be available with this:

```
(eval-after-load 'info
  '(add-to-list 'Info-additional-directory-list "~/development/auctex/doc"))
```

Now you’re ready to load auctex.el and preview-latex.el out of this directory:

```
(load "~/development/auctex/auctex.el" nil t t)
(load "~/development/auctex/preview-latex.el" nil t t)
```

1.2.7 Installation under MS Windows

In a Nutshell

The following are brief installation instructions for the impatient. In case you don’t understand some of this, run into trouble of some sort, or need more elaborate information, refer to the detailed instructions further below.

1. Install the prerequisites, i.e. GNU Emacs, MSYS or Cygwin, a \TeX{} system, and Ghostscript.
2. Open the MSYS shell or a Cygwin shell and change to the directory containing the unzipped file contents.

3. Configure AUCTeX:

For Emacs: Many people like to install AUCTeX into the pseudo file system hierarchy set up by the Emacs installation. Assuming Emacs is installed in `C:/Program Files/Emacs` and the directory for local additions of your TeX system, e.g. MiKTeX, is `C:/localtexmf`, you can do this by typing the following statement at the shell prompt:

```
./configure --prefix='C:/Program Files/Emacs' \ 
--infodir='C:/Program Files/Emacs/info' \ 
--with-texmf-dir='C:/localtexmf'
```

The commands above is example for common usage. More on configuration options can be found in the detailed installation instructions below.

If the configuration script failed to find all required programs, make sure that these programs are in your system path and add directories containing the programs to the `PATH` environment variable if necessary. Here is how to do that in W2000/XP:

1. On the desktop, right click “My Computer” and select properties.
2. Click on “Advanced” in the “System Properties” window.
3. Select “Environment Variables”.
4. Select “path” in “System Variables” and click “edit”. Move to the front in the line (this might require scrolling) and add the missing path including drive letter, ended with a semicolon.

4. If there were no further error messages, type

```
make
```

In case there were, please refer to the detailed description below.

5. Finish the installation by typing

```
make install
```

**Detailed Installation Instructions**

Installation of AUCTeX under Windows is in itself not more complicated than on other platforms. However, meeting the prerequisites might require more work than on some other platforms, and feel less natural.

If you are experiencing any problems, even if you think they are of your own making, be sure to report them to `auctex-devel@gnu.org` so that we can explain things better in future.

Windows is a problematic platform for installation scripts. The main problem is that the installation procedure requires consistent file names in order to find its way in the directory hierarchy, and Windows path names are a mess.

The installation procedure tries finding stuff in system search paths and in Emacs paths. For that to succeed, you have to use the same syntax and spelling and case of paths everywhere: in your system search paths, in Emacs’ `load-path` variable, as argument to the scripts. If your path names contain spaces or other ‘shell-unfriendly’ characters, most notably backslashes for directory separators, place the whole path in “`double quote marks`” whenever you specify it on a command line.
Avoid ‘helpful’ magic file names like ‘/cygdrive/c’ and ‘C:\PROGRA~1\’ like the plague. It is quite unlikely that the scripts will be able to identify the actual file names involved. Use the full paths, making use of normal Windows drive letters like ‘C:/Program Files/Emacs’ where required, and using the same combination of upper- and lowercase letters as in the actual files. File names containing shell-special characters like spaces or backslashes (if you prefer that syntax) need to get properly quoted to the shell: the above example used single quotes for that.

Ok, now here are the steps to perform:

1. You need to unpack the AUCTeX distribution (which you seemingly have done since you are reading this). It must be unpacked in a separate installation directory outside of your Emacs file hierarchy: the installation will later copy all necessary files to their final destination, and you can ultimately remove the directory where you unpacked the files.

   Line endings are a problem under Windows. The distribution contains only text files, and theoretically most of the involved tools should get along with that. However, the files are processed by various utilities, and it is conceivable that not all of them will use the same line ending conventions. If you encounter problems, it might help if you try unpacking (or checking out) the files in binary mode, if your tools allow that.

   If you don’t have a suitable unpacking tool, skip to the next step: this should provide you with a working ‘unzip’ command.

2. The installation of AUCTeX will require the MSYS tool set from http://www.mingw.org/ or the Cygwin tool set from https://cygwin.com/. The latter is slower and larger (the download size of the base system is about 15 MB) but comes with a package manager that allows for updating the tool set and installing additional packages like, for example, the spell checker aspell.

   If Cygwin specific paths like ‘/cygdrive/c’ crop up in the course of the installation, using a non-Cygwin Emacs could conceivably cause trouble. Using Cygwin either for everything or nothing might save headaches, if things don’t work out.


4. You need a working TeX installation. One popular installation under Windows is MiKTeX (https://miktex.org/). Another much more extensive system is TeX Live (https://www.tug.org/texlive/) which is rather close to its Unix cousins.

5. A working copy of Ghostscript (https://www.ghostscript.com/) is required for preview-latex operation. Examining the output from

   
gswin32c -h

   on a Windows command line should tell you whether your Ghostscript supports the png16m device needed for PNG support. MiKTeX apparently comes with its own Ghostscript called mgs.exe.

6. Perl (https://www.perl.org/) is needed for rebuilding the documentation if you are working with a copy from Git or have touched documentation source files in the preview-latex part. If the line endings of the file preview/latex/preview.dtx don’t correspond with what Perl calls \n when reading text files, you’ll run into trouble.

7. Now the fun stuff starts. If you have not yet done so, unpack the AUCTeX distribution into a separate directory after rereading the instructions for unpacking above.
8. Ready for takeoff. Start some shell (typically bash) capable of running configure, change into the installation directory and call ./configure with appropriate options. Typical options you’ll want to specify will be

```
--prefix=drive:/path/to/emacs-hierarchy
```

which tells configure where to perform the installation. It may also make configure find Emacs automatically; if this doesn’t happen, try --with-emacs as described below. All automatic detection of files and directories restricts itself to directories below the prefix or in the same hierarchy as the program accessing the files. Usually, directories like man, share and bin will be situated right under prefix.

This option also affects the defaults for placing the Texinfo documentation files (see also --infodir below) and automatically generated style hooks.

If you have a central directory hierarchy (not untypical with Cygwin) for such stuff, you might want to specify its root here. You stand a good chance that this will be the only option you need to supply, as long as your \TeX\-related executables are in your system path, which they better be for AUCTeX’s operation, anyway.

```
--with-emacs
```

if you are installing for a version of Emacs. You can use `--with-emacs=drive:/path/to/emacs' to specify the name of the installed Emacs executable, complete with its path if necessary (if Emacs is not within a directory specified in your PATH environment setting).

```
--with-lispdir=drive:/path/to/site-lisp
```

This option tells a place in load-path below which the files are situated. The startup files auctex.el and preview-latex.el will get installed here unless a subdirectory site-start.d exists which will then be used instead. The other files from AUCTeX will be installed in a subdirectory called auctex.

If you think that you need a different setup, please refer to the full installation instructions in Section 1.2.2 [Configure], page 5.

```
--infodir=drive:/path/to/info/directory
```

If you are installing into an Emacs directory, info files have to be put into the info folder below that directory. The configuration script will usually try to install into the folder share/info, so you have to override this by specifying something like `--infodir='C:/Program Files/info'' for the configure call.

```
--with-auto-dir=drive:/dir
```

Directory containing automatically generated information. You should not normally need to set this, as `--prefix' should take care of this.

```
--disable-preview
```

Use this option if your Emacs version is unable to support image display.
--with-texmf-dir=drive:/dir

This will specify the directory where your \TeX installation sits. If your \TeX installation does not conform to the TDS (\TeX directory standard), you may need to specify more options to get everything in place.

For more information about any of the above and additional options, see Section 1.2.2 [Configure], page 5.

Some executables might not be found in your path. That is not a good idea, but you can get around by specifying environment variables to configure:

\texttt{GS=drive:/path/to/gswin32c.exe} ./configure ...

should work for this purpose. \texttt{gswin32c.exe} is the usual name for the required \texttt{command line} executable under Windows; in contrast, \texttt{gswin32.exe} is likely to fail.

As an alternative to specifying variables for the \texttt{configure} call you can add directories containing the required executables to the \texttt{PATH} variable of your Windows system. This is especially a good idea if Emacs has trouble finding the respective programs later during normal operation.

9. Run \texttt{make} in the installation directory.
10. Run \texttt{make install} in the installation directory.
11. With Emacs, activation of AUCTeX and \texttt{preview-latex} depends on a working \texttt{site-start.d} directory or similar setup, since then the startup files \texttt{auctex.el} and \texttt{preview-latex.el} will have been placed there. If this has not been done, you should be able to load the startup files manually with

\begin{verbatim}
(load "auctex.el" nil t t)
(load "preview-latex.el" nil t t)
\end{verbatim}

in either a site-wide \texttt{site-start.el} or your personal startup file (usually accessible as \texttt{"/emac} or \texttt{"/emacs.d/init.el} from within Emacs).

The default configuration of AUCTeX is probably not the best fit for Windows systems with MiKTeX. You might want to add

\begin{verbatim}
(require 'tex-mik)
\end{verbatim}

after loading \texttt{auctex.el} and \texttt{preview-latex.el} in order to get more appropriate values for some customization options.

You can always use

\begin{verbatim}
M-x customize-group RET AUCTeX RET
\end{verbatim}

in order to customize more stuff, or use the ‘Customize’ menu.

12. Load \texttt{circ.tex} into Emacs and see if you get the ‘Command’ menu. Try using it to \LaTeX{} the file.
13. Check whether the ‘Preview’ menu is available in this file. Use it to generate previews for the document.

If this barfs and tells you that image type ‘png’ is not supported, you can either add PNG support to your Emacs installation or choose another image format to be used by \texttt{preview-latex}.

Adding support for an image format usually involves the installation of a library, e.g. from \texttt{http://gnuwin32.sf.net/}. If you got your Emacs from \texttt{https://www.gnu}. 

A different image format can be chosen by setting the variable `preview-image-type`. While it is recommended to keep the ‘dvipng’ or ‘png’ setting, you can temporarily select a different format like ‘pnm’ to check if the lack of PNG support is the only problem with your Emacs installation.

Try adding the line

```
(setq preview-image-type 'pnm)
```

to your init file for a quick test. You should remove the line after the test again, because PNM files take away vast amounts of disk space, and thus also of load/save time.

Well, that about is all. Have fun!

### 1.2.8 Customizing

Most of the site-specific customization should already have happened during configuration of AUCTeX. Any further customization can be done with customization buffers directly in Emacs. Just type `M-x customize-group RET AUCTeX RET` to open the customization group for AUCTeX or use the menu entries provided in the mode menus. Editing the file tex-site.el as suggested in former versions of AUCTeX should not be done anymore because the installation routine will overwrite those changes.

You might check some options with a special significance. They are accessible directly by typing `M-x customize-option RET <option> RET`.

**TeX-macro-global**

Directories containing the site’s TeX style files.

Normally, AUCTeX will only allow you to complete macros and environments which are built-in, specified in AUCTeX style files or defined by yourself. If you issue the `M-x TeX-auto-generate-global` command after loading AUCTeX, you will be able to complete on all macros available in the standard style files used by your document. To do this, you must set this variable to a list of directories where the standard style files are located. The directories will be searched recursively, so there is no reason to list subdirectories explicitly. Automatic configuration will already have set the variable for you if it could use the program kpsewhich. In this case you normally don’t have to alter anything.

### 1.3 Quick Start

AUCTeX is a powerful program offering many features and configuration options. If you are new to AUCTeX this might be deterrent. Fortunately you do not have to learn everything at once. This Quick Start Guide will give you the knowledge of the most important commands and enable you to prepare your first LaTeX document with AUCTeX after only a few minutes of reading.

In this introduction, we assume that AUCTeX is already installed on your system. If this is not the case, you should read the file INSTALL in the base directory of the unpacked distribution tarball. These installation instructions are available in this manual as well, Section 1.2 [Installation], page 4. We also assume that you are familiar with the way
keystrokes are written in Emacs manuals. If not, have a look at the Emacs Tutorial in the Help menu.

If AUCTeX is installed in any other way than from the Emacs package manager (ELPA), you might still need to activate it, by inserting

\begin{verbatim}
(load "auctex.el" nil t t)
\end{verbatim}

in your user init file.\footnote{This usually is a file in your home directory called \texttt{.emacs} or \texttt{.emacs.d/init.el}.}

If AUCTeX is installed from ELPA, the installation procedure already cares about loading AUCTeX correctly and you \textbf{must not} have the line above in your init file. Note that this also applies if you have the following line in your init file

\begin{verbatim}
(packages-initialize)
\end{verbatim}

In order to get support for many of the \LaTeX\ packages you will use in your documents, you should enable document parsing as well, which can be achieved by putting

\begin{verbatim}
(setq TeX-auto-save t)
(setq TeX-parse-self t)
\end{verbatim}

into your init file. Finally, if you often use \texttt{\textbackslash include} or \texttt{\textbackslash input}, you should make AUCTeX aware of the multifile document structure. You can do this by inserting

\begin{verbatim}
(setq-default TeX-master nil)
\end{verbatim}

into your init file. Each time you open a new file, AUCTeX will then ask you for a master file.

This Quick Start Guide covers two main topics: First we explain how AUCTeX helps you in editing your input file for \TeX, \LaTeX, and some other formats. Then we describe the functions that AUCTeX provides for processing the input files with \LaTeX, \BibTeX, etc., and for viewing and debugging.

\subsection*{1.3.1 Functions for editing \TeX{} files}

\subsubsection*{1.3.1.1 Making your \TeX{} code more readable}

AUCTeX can do syntax highlighting of your source code, that means commands will get special colors or fonts. This is enabled by default. You can disable it locally by typing \texttt{M-x font-lock-mode RET}.

AUCTeX will indent new lines to indicate their syntactical relationship to the surrounding text. For example, the text of a \texttt{\footnote} or text inside of an environment will be indented relative to the text around it. If the indenting has gotten wrong after adding or deleting some characters, use \texttt{\textbackslash indent} to reindent the line, \texttt{M-q} for the whole paragraph, or \texttt{M-x LaTeX-fill-buffer RET} for the whole buffer.

\subsubsection*{1.3.1.2 Entering sectioning commands}

Insertion of sectioning macros, that is \texttt{\textbackslash chapter}, \texttt{\textbackslash section}, \texttt{\textbackslash subsection}, etc. and accompanying \texttt{\textbackslash label} commands may be eased by using \texttt{\textbackslash c-c \textbackslash c-s}. You will be asked for the section level. As nearly everywhere in AUCTeX, you can use the \texttt{\textbackslash indent} or \texttt{\textbackslash indent} key to get a list of available level names, and to auto-complete what you started typing. Next, you will be asked for the printed title of the section, and last you will be asked for a label to be associated with the section.
1.3.1.3 Inserting environments

Similarly, you can insert environments, that is ‘\begin{}’–’\end{}’ pairs: Type C-c C-e, and select an environment type. Again, you can use TAB or SPC to get a list, and to complete what you type. Actually, the list will not only provide standard \LaTeX\ environments, but also take your ‘\documentclass’ and ‘\usepackage’ commands into account if you have parsing enabled by setting TeX-parse-self to t. If you use a couple of environments frequently, you can use the up and down arrow keys (or M-p and M-n) in the minibuffer to get back to the previously inserted commands.

Some environments need additional arguments. Often, AUCTeX knows about this and asks you to enter a value.

1.3.1.4 Inserting macros

C-c C-m, or simply C-c RET will give you a prompt that asks you for a \LaTeX\ macro. You can use TAB for completion, or the up/down arrow keys (or M-p and M-n) to browse the command history. In many cases, AUCTeX knows which arguments a macro needs and will ask you for that. It even can differentiate between mandatory and optional arguments—for details, see Section 2.6 [Completion], page 32.

An additional help for inserting macros is provided by the possibility to complete macros right in the buffer. With point at the end of a partially written macro, you can complete it by typing M-TAB.

1.3.1.5 Changing the font

AUCTeX provides convenient keyboard shortcuts for inserting macros which specify the font to be used for typesetting certain parts of the text. They start with C-c C-f, and the last C- combination tells AUCTeX which font you want:

C-c C-f C-b
   Insert bold face ‘\textbf{*}’ text.

C-c C-f C-i
   Insert italics ‘\textit{*}’ text.

C-c C-f C-e
   Insert emphasized ‘\emph{*}’ text.

C-c C-f C-s
   Insert slanted ‘\textsl{*}’ text.

C-c C-f C-r
   Insert roman ‘\textsc{*}’ text.

C-c C-f C-f
   Insert sans serif ‘\textsf{*}’ text.

C-c C-f C-t
   Insert typewriter ‘\texttt{*}’ text.

C-c C-f C-c
   Insert SMALL CAPS ‘\textsc{*}’ text.

C-c C-f C-d
   Delete the innermost font specification containing point.
If you want to change font attributes of existing text, mark it as an active region, and then invoke the commands. If no region is selected, the command will be inserted with empty braces, and you can start typing the changed text.

Most of those commands will also work in math mode, but then macros like \textbf{will be inserted.}

1.3.1.6 Other useful features

AUCTeX also tries to help you when inserting the right “quote” signs for your language, dollar signs to typeset math, or pairs of braces. It offers shortcuts for commenting out text (C-c ; for the current region or C-c % for the paragraph you are in). The same keystrokes will remove the % signs, if the region or paragraph is commented out yet. With TeX-fold-mode, you can hide certain parts (like footnotes, references etc.) that you do not edit currently. Support for Emacs’ outline mode is provided as well. And there’s more, but this is beyond the scope of this Quick Start Guide.

1.3.2 Creating and viewing output, debugging

1.3.2.1 One Command for LaTeX, helpers, viewers, and printing

If you have typed some text and want to run LaTeX (or TeX, or other programs—see below) on it, type C-c C-c. If applicable, you will be asked whether you want to save changes, and which program you want to invoke. In many cases, the choice that AUCTeX suggests will be just what you want: first \texttt{latex}, then a viewer. If a \texttt{latex} run produces or changes input files for \texttt{makeindex}, the next suggestion will be to run that program, and AUCTeX knows that you need to run \texttt{latex} again afterwards—the same holds for BibTeX.

When no processor invocation is necessary anymore, AUCTeX will suggest to run a viewer, or you can chose to create a PostScript file using \texttt{dvips}, or to directly print it.

Actually, there is another command which comes in handy to compile documents: type C-c C-a (\texttt{TeX-command-run-all}) and AUCTeX will compile the document for you until it is ready and then run the viewer. This is the same as issuing repeatedly C-c C-c and letting AUCTeX guess the next command to run.

At this place, a warning needs to be given: First, although AUCTeX is really good in detecting the standard situations when an additional \texttt{latex} run is necessary, it cannot detect it always. Second, the creation of PostScript files or direct printing currently only works when your output file is a DVI file, not a PDF file.

Ah, you didn’t know you can do both? That brings us to the next topic.

1.3.2.2 Choosing an output format

From a \texttt{LaTeX} file, you can produce DVI output, or a PDF file directly via \texttt{pdflatex}. You can switch on source specials for easier navigation in the output file, or tell \texttt{latex} to stop after an error (usually \texttt{--noninteractive} is used, to allow you to detect all errors in a single run).

These options are controlled by toggles, the keystrokes should be easy to memorize:

\begin{verbatim}
C-c C-t C-p
\end{verbatim}

This command toggles between DVI and PDF output
\texttt{C-c C-t C-i}  
  toggles interactive mode

\texttt{C-c C-t C-s}  
  toggles Sync\TeX{} (or source specials) support

\texttt{C-c C-t C-o}  
  toggles usage of Omega/\lambda{}.

There is also another possibility: compile the document with \texttt{tex} (or \texttt{latex}) and then convert the resulting DVI file to PDF using \texttt{dvips-ps2pdf} sequence or \texttt{dvipdfmx} command. If you want to go by this route, customize \texttt{TeX-PDF-from-DVI} option. Then AUCTeX will suggest you to run the appropriate command when you type \texttt{C-C C-c}. For details, see Section 4.1.3 [Processor Options], page 59.

1.3.2.3 Debugging \LaTeX{}

When AUCTeX runs a program, it creates an output buffer in which it displays the output of the command. If there is a syntactical error in your file, \texttt{latex} will not complete successfully. AUCTeX will tell you that, and you can get to the place where the first error occurred by pressing \texttt{C-c `} (the last character is a backtick). The view will be split in two windows, the output will be displayed in the lower buffer, and both buffers will be centered around the place where the error occurred. You can then try to fix it in the document buffer, and use the same keystrokes to get to the next error. This procedure may be repeated until all errors have been dealt with. By pressing \texttt{C-c C-w (TeX-toggle-debug-boxes)} you can toggle whether AUCTeX should notify you of overfull and underfull boxes in addition to regular errors.

Issue \texttt{M-x TeX-error-overview RET} to see a nicely formatted list of all errors and warnings reported by the compiler.

If a command got stuck in a seemingly infinite loop, or you want to stop execution for other reasons, you can use \texttt{C-c C-k} (for “kill”). Similar to \texttt{C-1}, which centers the buffer you are in around your current position, \texttt{C-c C-1} centers the output buffer so that the last lines added at the bottom become visible.

1.3.2.4 Running \LaTeX{} on parts of your document

If you want to check how some part of your text looks like, and do not want to wait until the whole document has been typeset, then mark it as a region and use \texttt{C-c C-r}. It behaves just like \texttt{C-c C-c}, but it only uses the document preamble and the region you marked.

If you are using \texttt{\include} or \texttt{\input} to structure your document, try \texttt{C-c C-b} while you are editing one of the included files. It will run \texttt{latex} only on the current buffer, using the preamble from the master file.
2 Editing the Document Source

The most commonly used commands/macros of AUCTeX are those which simply insert templates for often used TeX, LaTeX, or ConTeXt constructs, like font changes, handling of environments, etc. These features are very simple, and easy to learn, and help you avoid mistakes like mismatched braces, or \texttt{\begin{...}-\end{...}} pairs.

Apart from that this chapter contains a description of some features for entering more specialized sorts of text, for formatting the source by indenting and filling and for navigating through the document.

2.1 Insertion of Quotes, Dollars, and Braces

Quotation Marks

In TeX, literal double quotes ‘\texttt{"like this"}’ are seldom used, instead two single quotes are used ‘\texttt{\'like this\''}’. To help you insert these efficiently, AUCTeX allows you to continue to press ‘\texttt{"}’ to insert two single quotes. To get a literal double quote, press ‘\texttt{"}’ twice.

\begin{verbatim}
TeX-insert-quote count \texttt{(*) Insert the appropriate quote marks for TeX.}
\texttt{Inserts the value of TeX-open-quote (normally \texttt{'''}) or TeX-close-quote (normally \texttt{''}) depending on the context. With prefix argument, always inserts ‘\texttt{''}’ characters.}

TeX-open-quote \texttt{[User Option]}
\texttt{String inserted by typing ‘\texttt{"}’ to open a quotation. (See Section 5.4.1 [European], page 75, for language-specific quotation mark insertion.)}

TeX-close-quote \texttt{[User Option]}
\texttt{String inserted by typing ‘\texttt{"}’ to close a quotation. (See Section 5.4.1 [European], page 75, for language-specific quotation mark insertion.)}

TeX-quote-after-quote \texttt{[User Option]}
\texttt{Determines the behavior of ‘\texttt{"}’. If it is non-nil, typing ‘\texttt{"}’ will insert a literal double quote. The respective values of TeX-open-quote and TeX-close-quote will be inserted after typing ‘\texttt{"}’ once again.}
\end{verbatim}

The ‘babel’ package provides special support for the requirements of typesetting quotation marks in many different languages. If you use this package, either directly or by loading a language-specific style file, you should also use the special commands for quote insertion instead of the standard quotes shown above. AUCTeX is able to recognize several of these languages and will change quote insertion accordingly. See Section 5.4.1 [European], page 75, for details about this feature and how to control it.

In case you are using the ‘csquotes’ package, you should customize \texttt{LaTeX-csquotes-open-quote}, \texttt{LaTeX-csquotes-close-quote} and \texttt{LaTeX-csquotes-quote-after-quote}. The quotation characters will only be used if both variables—\texttt{LaTeX-csquotes-open-quote} and \texttt{LaTeX-csquotes-close-quote}—are non-empty strings. But then the ‘csquotes’-related values will take precedence over the language-specific ones.
Dollar Signs

In AUCTeX, dollar signs should match like they do in \TeX\. This has been partially implemented, we assume dollar signs always match within a paragraph. By default, the first ‘$’ you insert in a paragraph will do nothing special. The second ‘$’ will match the first. This will be indicated by moving the cursor temporarily over the first dollar sign.

**TeX-insert-dollar arg**

[Command]

($) Insert dollar sign.

- Show matching dollar sign if this dollar sign end the \TeX\ math mode.
- With optional arg, insert that many dollar signs.

\TeX\ and \LaTeX\ users often look for a way to insert inline equations like ‘$...$’ or ‘\(...\)’ simply typing \$. AUCTeX helps them through the customizable variable \TeX-electric-math.

**TeX-electric-math**

[User Option]

- If the variable is non-nil and you type \$ outside math mode, AUCTeX will automatically insert the opening and closing symbols for an inline equation and put the point between them. The opening symbol will blink when \texttt{blink-matching-paren} is non-nil. If \TeX-electric-math is nil, typing \$ simply inserts ‘$’ at point, this is the default.
- Besides \texttt{nil}, possible values for this variable are ("$" . "$") for \TeX\ inline equations ‘$...$’, and ("\(" . ",\)") for \LaTeX\ inline equations ‘\(...\)’.
- If the variable is non-nil and point is inside math mode right between a couple of single dollars, pressing \$ will insert another pair of dollar signs and leave the point between them. Thus, if \TeX-electric-math is set to ("$" . "$") you can easily obtain a \TeX\ display equation ‘\$...\$’ by pressing \$ twice in a row. (Note that you should not use double dollar signs in \LaTeX\ because this practice can lead to wrong spacing in typeset documents.)
- In addition, when the variable is non-nil and there is an active region outside math mode, typing \$ will put around the active region symbols for opening and closing inline equation and keep the region active, leaving point after the closing symbol. By pressing repeatedly \$ while the region is active you can toggle between an inline equation, a display equation, and no equation. To be precise, ‘$...$’ is replaced by ‘\$...\$’, whereas ‘\(.\ldots\)’ is replaced by ‘\[\ldots\]’.

If you want to automatically insert ‘$...$’ in plain \TeX\ files, and ‘\(.\ldots\)’ in \LaTeX\ files by pressing \$, add the following to your init file

```
(add-hook 'plain-TeX-mode-hook
  (lambda () (set (make-local-variable 'TeX-electric-math)
    (cons "$" "$")))))

(add-hook 'LaTeX-mode-hook
  (lambda () (set (make-local-variable 'TeX-electric-math)
    (cons "\(" "\)"))))
```

Math mode which didn’t start with dollar(s) shouldn’t be closed with dollar.
**TeX-refuse-unmatched-dollar**  
[User Option]
This option determines the behavior when the user types $ at a position where AUCTeX thinks that it is in math mode which didn’t start with dollar(s).

When this option is nil, AUCTeX behaves in the same way as non-math mode, assuming that the user knows it isn’t in math mode actually. This is the default.

When this option is non-nil, AUCTeX refuses to insert ‘$’ to prevent unmatched dollar.

Note that Texinfo mode does nothing special for $. It inserts dollar sign(s) just in the same way as the other normal keys do.

**Braces**
To avoid unbalanced braces, it is useful to insert them pairwise. You can do this by typing C-c {.

**TeX-insert-braces**  
[Command]
(C-c {) Make a pair of braces and position the cursor to type inside of them. If there is an active region, put braces around it and leave point after the closing brace.

When writing complex math formulas in LaTeX documents, you sometimes need to adjust the size of braces with pairs of macros like ‘\left’-‘\right’, ‘\bigl’-‘\bigr’ and so on. You can avoid unbalanced pairs with the help of **TeX-insert-macro**, bound to C-c C-m or C-c RET (see Section 2.6 [Completion], page 32). If you insert left size adjusting macros such as ‘\left’, ‘\bigl’ etc. with **TeX-insert-macro**, it asks for left brace to use and supplies automatically right size adjusting macros such as ‘\right’, ‘\bigr’ etc. and corresponding right brace in addition to the intended left macro and left brace.

The completion by **TeX-insert-macro** also applies when entering macros such as ‘\langle’, ‘\lfloor’ and ‘\lceil’, which produce the left part of the paired braces. For example, inserting ‘\lfloor’ by C-c C-m is immediately followed by the insertion of ‘\rfloor’. In addition, if the point was located just after ‘\left’ or its friends, the corresponding ‘\right’ etc. will be inserted in front of ‘\rfloor’. In both cases, active region is honored.

As a side effect, when LaTeX-math-mode (see Section 2.5 [Mathematics], page 30) is on, just typing ‘( inserts not only ‘\langle’, but also ‘\rangle’.

If you do not like such auto completion at all, it can be disabled by a user option.

**TeX-arg-right-insert-p**  
[User Option]
If this option is turned off, the automatic supply of the right macros and braces is suppressed.

When you edit LaTeX documents, you can enable automatic brace pairing when typing ⟨, { and [.

**LaTeX-electric-left-right-brace**  
[User Option]
If this option is on, just typing ⟨, { or [ immediately adds the corresponding right brace ‘⟩’, ‘}’ or ‘]’. The point is left after the opening brace. If there is an active region, braces are put around it.
They recognize the preceding backslash or size adjusting macros such as ‘\left’, ‘\bigl’ etc., so the following completions will occur:

- (when typing single left brace)
  - ‘(’ -> ‘()’
  - ‘[’ -> ‘[ ]’
  - ‘\’ -> ‘\[]’
- (when typing left brace just after a backslash)
  - ‘\(’ -> ‘\[\right)’
  - ‘\{’ -> ‘\{\}’
  - ‘\[’ -> ‘\[\]’
- (when typing just after ‘\left’ or ‘\bigl’)
  - ‘\left(’ -> ‘\left\right)’
  - ‘\bigl[’ -> ‘\bigl[\bigr]’
- (when typing just after ‘\Bigl’)
  - ‘\Bigl\{’ -> ‘\Bigl\{\Bigr\}’

This auto completion feature may be a bit annoying when editing an already existing \LaTeX document. In that case, use C-u 1 or C-q before typing (, { or [. Then no completion is done and just a single left brace is inserted. In fact, with optional prefix arg, just that many open braces are inserted without any completion.

### 2.2 Inserting Font Specifiers

Perhaps the most used keyboard commands of AUCTeX are the short-cuts available for easy insertion of font changing macros.

If you give an argument (that is, type C-u) to the font command, the innermost font will be replaced, i.e. the font in the \TeX group around point will be changed. The following table shows the available commands, with ⋆ indicating the position where the text will be inserted.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-c C-f C-b</td>
<td>Insert bold face ‘\textbf{⋆}’ text.</td>
</tr>
<tr>
<td>C-c C-f C-m</td>
<td>Insert medium face ‘\textmd{⋆}’ text.</td>
</tr>
<tr>
<td>C-c C-f C-i</td>
<td>Insert italics ‘\textit{⋆}’ text.</td>
</tr>
<tr>
<td>C-c C-f C-e</td>
<td>Insert emphasized ‘\emph{⋆}’ text.</td>
</tr>
<tr>
<td>C-c C-f C-s</td>
<td>Insert slanted ‘\textsl{⋆}’ text.</td>
</tr>
<tr>
<td>C-c C-f C-r</td>
<td>Insert roman ‘\texttt{⋆}’ text.</td>
</tr>
</tbody>
</table>
Chapter 2: Editing the Document Source

2.3 Inserting chapters, sections, etc.

Insertion of sectioning macros, that is ‘\chapter’, ‘\section’, ‘\subsection’, etc. and accompanying ‘\label’’s may be eased by using \texttt{C-c C-s}. This command is highly customizable, the following describes the default behavior.

When invoking you will be asked for a section macro to insert. An appropriate default is automatically selected by AUCTeX, that is either: at the top of the document; the top level sectioning for that document style, and any other place: The same as the last occurring sectioning command.

Next, you will be asked for the actual name of that section, and last you will be asked for a label to be associated with that section. The label will be prefixed by the value specified in \texttt{LaTeX-section-hook}.
LaTeX-section arg

(C-c C-s) Insert a sectioning command.

Determine the type of section to be inserted, by the argument arg.

- If arg is nil or missing, use the current level.
- If arg is a list (selected by C-u), go downward one level.
- If arg is negative, go up that many levels.
- If arg is positive or zero, use absolute level:
  + 0 : part
  + 1 : chapter
  + 2 : section
  + 3 : subsection
  + 4 : subsubsection
  + 5 : paragraph
  + 6 : subparagraph

The following variables can be set to customize the function.

LaTeX-section-hook
  Hooks to be run when inserting a section.

LaTeX-section-label
  Prefix to all section references.

The precise behavior of LaTeX-section is defined by the contents of LaTeX-section-hook.

LaTeX-section-hook [User Option]

List of hooks to run when a new section is inserted.

The following variables are set before the hooks are run

LaTeX-level
  Numeric section level, default set by prefix arg to LaTeX-section.

LaTeX-name
  Name of the sectioning command, derived from LaTeX-level.

LaTeX-title
  The title of the section, default to an empty string.

LaTeX-toc
  Entry for the table of contents list, default nil.

LaTeX-done-mark
  Position of point afterwards, default nil meaning after the inserted text.

A number of hooks are already defined. Most likely, you will be able to get the desired functionality by choosing from these hooks.

LaTeX-section-heading
  Query the user about the name of the sectioning command. Modifies LaTeX-level and LaTeX-name.
LaTeX-section-title
Query the user about the title of the section. Modifies LaTeX-title.

LaTeX-section-toc
Query the user for the toc entry. Modifies LaTeX-toc.

LaTeX-section-section
Insert \LaTeX section command according to LaTeX-name, LaTeX-title, and LaTeX-toc. If LaTeX-toc is nil, no toc entry is inserted. If LaTeX-toc or LaTeX-title are empty strings, LaTeX-done-mark will be placed at the point they should be inserted.

LaTeX-section-label
Insert a label after the section command. Controlled by the variable LaTeX-section-label.

To get a full featured \LaTeX section command, insert

\begin{Verbatim}
(setq LaTeX-section-hook
  '(LaTeX-section-heading
    LaTeX-section-title
    LaTeX-section-toc
    LaTeX-section-section
    LaTeX-section-label))
\end{Verbatim}

in your init file such as init.el or .emacs.

The behavior of LaTeX-section-label is determined by the variable LaTeX-section-label.

LaTeX-section-label [User Option]
Default prefix when asking for a label.
If it is a string, it is used unchanged for all kinds of sections. If it is nil, no label is inserted. If it is a list, the list is searched for a member whose car is equal to the name of the sectioning command being inserted. The cdr is then used as the prefix. If the name is not found, or if the cdr is nil, no label is inserted.

By default, chapters have a prefix of ‘cha:’ while sections and subsections have a prefix of ‘sec:’. Labels are not automatically inserted for other types of sections.

2.4 Inserting Environment Templates
A large apparatus is available that supports insertions of environments, that is ‘\begin{...}’ — ‘\end{...}’ pairs.

\verb+AUCTeX+ is aware of most of the actual environments available in a specific document. This is achieved by examining your \texttt{\documentclass} command, and consulting a precompiled list of environments available in a large number of styles.

Most of these are described further in the following sections, and you may easily specify more. See Section 2.4.5 [Customizing Environments], page 30.

You insert an environment with \texttt{C-c C-e}, and select an environment type. Depending on the environment, \verb+AUCTeX+ may ask more questions about the optional parts of the selected environment type. With \texttt{C-u C-c C-e} you will change the current environment.
\begin{itemize}
\item \textbf{LaTeX-environment arg} \hfill [Command]
\item \textbf{LaTeX-label-alist} \hfill [User Option]
\item \textbf{LaTeX-default-environment} \hfill [User Option]
\item \textbf{LaTeX-default-document-environment} \hfill [Variable]
\item \textbf{TeX-complete-expert-commands} \hfill [User Option]
\end{itemize}

\textbf{LaTeX-environment arg}

(C-c C-e) \texttt{AUCTeX} will prompt you for an environment to insert. At this prompt, you may press TAB or SPC to complete a partially written name, and/or to get a list of available environments. After selection of a specific environment \texttt{AUCTeX} may prompt you for further specifications.

If the optional argument \texttt{arg} is non-nil (i.e. you have given a prefix argument), the current environment is modified and no new environment is inserted.

\texttt{AUCTeX} helps you adding labels to environments which use them, such as \texttt{equation}, \texttt{figure}, \texttt{table}, etc... When you insert one of the supported environments with C-c C-e, you will be automatically prompted for a label. You can select the prefix to be used for such environments with the \texttt{LaTeX-label-alist} variable.

\textbf{LaTeX-label-alist}

List the prefixes to be used for the label of each supported environment.

This is an alist whose car is the environment name, and the cdr either the prefix or a symbol referring to one.

If the name is not found, or if the cdr is nil, no label is automatically inserted for that environment.

If you want to automatically insert a label for a environment but with an empty prefix, use the empty string "" as the cdr of the corresponding entry.

As a default selection, \texttt{AUCTeX} will suggest the environment last inserted or, as the first choice the value of the variable \texttt{LaTeX-default-environment}.

\textbf{LaTeX-default-environment}

Default environment to insert when invoking \texttt{LaTeX-environment} first time. When the current environment is \texttt{document}, it is overriden by \texttt{LaTeX-default-document-environment}.

\textbf{LaTeX-default-document-environment}

Default environment when invoking \texttt{LaTeX-environment} and the current environment is \texttt{document}. It is intended to be used in \LaTeX{} class style files. For example, in \texttt{beamer.el} it is set to \texttt{frame}, in \texttt{letter.el} to \texttt{letter}, and in \texttt{slides.el} to \texttt{slide}.

If the document is empty, or the cursor is placed at the top of the document, \texttt{AUCTeX} will default to insert a \texttt{document} environment prompting also for the insertion of \texttt{\documentclass} and \texttt{\usepackage} macros. You will be prompted for a new package until you enter nothing. If you do not want to insert any \texttt{\usepackage} at all, just press RET at the first \texttt{Packages} prompt.

\texttt{AUCTeX} distinguishes normal and expert environments. By default, it will offer completion only for normal environments. This behavior is controlled by the user option \texttt{TeX-complete-expert-commands}.

\textbf{TeX-complete-expert-commands}

Complete macros and environments marked as expert commands.

Possible values are \texttt{nil}, \texttt{t}, or a list of style names.

\texttt{nil} \hfill Don’t complete expert commands (default).
Always complete expert commands.

$(styles \ldots)$

Only complete expert commands of styles.

You can close the current environment with $C-c \ J$, but we suggest that you use $C-c \ C-e$ to insert complete environments instead.

**LaTeX-close-environment**  
($C-c \ J$) Insert an ‘\end’ that matches the current environment.

AUCTeX offers keyboard shortcuts for moving point to the beginning and to the end of the current environment.

**LaTeX-find-matching-begin**  
($C-M-a$) Move point to the ‘\begin’ of the current environment.

If this command is called inside a comment and LaTeX-syntactic-comments is enabled, try to find the environment in commented regions with the same comment prefix.

The key bind $C-M-a$ actually calls beginning-of-defun, which in turn calls LaTeX-find-matching-begin.

**LaTeX-find-matching-end**  
($C-M-e$) Move point to the ‘\end’ of the current environment.

If this command is called inside a comment and LaTeX-syntactic-comments is enabled, try to find the environment in commented regions with the same comment prefix.

The key bind $C-M-e$ actually calls end-of-defun, which in turn calls LaTeX-find-matching-end.

### 2.4.1 Equations

When inserting equation-like environments, the ‘\label’ will have a default prefix, which is controlled by the following variables:

**LaTeX-equation-label**  
[User Option]

Prefix to use for ‘equation’ labels.

**LaTeX-eqnarray-label**  
[User Option]

Prefix to use for ‘eqnarray’ labels.

**LaTeX-amsmath-label**  
[User Option]

2.4.2 Floats

Figures and tables (i.e., floats) may also be inserted using AUCTeX. After choosing either ‘figure’ or ‘table’ in the environment list described above, you will be prompted for a number of additional things.

**float position**

This is the optional argument of float environments that controls how they are placed in the final document. In LaTeX this is a sequence of the letters ‘htbp’ as described in the LaTeX manual. The value will default to the value of LaTeX-float.

**caption**

This is the caption of the float. The default is to insert the caption at the bottom of the float. You can specify floats where the caption should be placed at the top with LaTeX-top-caption-list.

**short caption**

If the specified caption is greater than a specific length, then a short caption is prompted for and it is inserted as an optional argument to the ‘\caption’ macro. The length that a caption needs to be before prompting for a short version is controlled by LaTeX-short-caption-prompt-length.

**label**

The label of this float. The label will have a default prefix, which is controlled by the variables LaTeX-figure-label and LaTeX-table-label.

Moreover, you will be asked if you want the contents of the float environment to be horizontally centered. Upon a positive answer a ‘\centering’ macro will be inserted at the beginning of the float environment.

**LaTeX-float**

Default placement for floats.

**LaTeX-figure-label**

Prefix to use for figure labels.

**LaTeX-table-label**

Prefix to use for table labels.

**LaTeX-top-caption-list**

List of float environments with top caption.

**LaTeX-short-caption-prompt-length**

Number of chars a caption should be before prompting for a short caption.

2.4.3 Itemize-like Environments

In an itemize-like environment, nodes (i.e., ‘\item’s) may be inserted using C-c LFD or M-RET. The latter is only defined as an alias if the key binding is still available.

**LaTeX-insert-item**

(C-c LFD or M-RET) Close the current item, move to the next line and insert an appropriate ‘\item’ for the current environment. That is, ‘itemize’ and ‘enumerate’ will have ‘\item’ inserted, while ‘description’ will have ‘\item[]’ inserted.
TeX-arg-item-label-p  [User Option]
If non-nil, you will always be asked for optional label in items. Otherwise, you will be asked only in description environments.

2.4.4 Tabular-like Environments
When inserting Tabular-like environments, that is, ‘tabular’ ‘array’ etc., you will be prompted for a template for that environment. Related variables:

\TeX-default-format  [User Option]
Default format string for array and tabular environments.

\TeX-default-width  [User Option]
Default width for minipage and tabular* environments.

\TeX-default-position  [User Option]
Default position string for array and tabular environments. If nil, act like the empty string is given, but don’t prompt for a position.

AUCTeX calculates the number of columns from the format string and inserts the suitable number of ampersands.

You can use \texttt{C-c LFD} or \texttt{M-RET} (\texttt{TeX-insert-item}) to terminate rows in these environments. It supplies line break macro ‘\\’ and inserts the suitable number of ampersands on the next line. AUCTeX also supports the ‘*\{num\}{cols}\’ notation (which may contain another ‘*’-expression) in the format string when calculating the number of ampersands.

Please note that ‘num’ and ‘cols’ must be enclosed in braces; expressions like ‘*2l’ are not recognized correctly by the algorithm.

\TeX-insert-item  [Command]
\(\texttt{(C-c LFD or M-RET)}\) Close the current row with ‘\\’, move to the next line and insert an appropriate number of ampersands for the current environment.

Similar supports are provided for various amsmath environments such as ‘align’, ‘gather’, ‘alignat’, ‘matrix’ etc. Try typing \texttt{C-c LFD} or \texttt{M-RET} in these environments. It recognizes the current environment and does the appropriate job depending on the context.

2.4.5 Customizing Environments
See Section 5.6.3 [Adding Environments], page 88, for how to customize the list of known environments.

2.5 Entering Mathematics
\TeX is written by a mathematician, and has always contained good support for formatting mathematical text. AUCTeX supports this tradition, by offering a special minor mode for entering text with many mathematical symbols. You can enter this mode by typing \texttt{C-c ‘}.  

\TeX-math-mode  [Command]
\(\texttt{(C-c ‘)}\) Toggle \LaTeX Math mode. This is a minor mode rebinding the key \LaTeX-math-abbrev-prefix to allow easy typing of mathematical symbols. ‘ will read
a character from the keyboard, and insert the symbol as specified in \LaTeX-math-default and \LaTeX-math-list. If given a prefix argument, the symbol will be surrounded by dollar signs.

You can use another prefix key (instead of `) by setting the variable \LaTeX-math-abbrev-prefix.

To enable \LaTeX Math mode by default, add the following in your init file such as init.el or .emacs:

```
(add-hook 'LaTeX-mode-hook #'LaTeX-math-mode)
```

\LaTeX-math-abbrev-prefix [User Option]
A string containing the prefix of \LaTeX-math-mode commands; This value defaults to `.```

The string has to be a key or key sequence in a format understood by the kbd macro.
This corresponds to the syntax usually used in the manuals for Emacs Lisp.

The variable \LaTeX-math-list allows you to add your own mappings.

\LaTeX-math-list [User Option]
A list containing user-defined keys and commands to be used in \LaTeX Math mode.
Each entry should be a list of two to four elements.

First, the key to be used after \LaTeX-math-abbrev-prefix for macro insertion. The key can be a character (e.g. `'o`) for a single stroke or a string (e.g. `"o a")`) for a multi-stroke binding. If it is nil, the symbol has no associated keystroke (it is available in the menu, though).

Second, a string representing the name of the macro (without a leading backslash.)
Third, a string representing the name of a submenu the command should be added to. Use a list of strings in case of nested menus.
Fourth, the position of a Unicode character to be displayed in the menu alongside the macro name. This is an integer value.

\LaTeX-math-menu-unicode [User Option]
Whether the \LaTeX Math menu should try using Unicode for effect. Your Emacs built must be able to display include Unicode characters in menus for this feature.

AUCTeX’s reference card tex-ref.tex includes a list of all math mode commands.

AUCTeX can help you write subscripts and superscripts in math constructs by automatically inserting a pair of braces after typing `_` or `^` respectively and putting point between the braces. In order to enable this feature, set the variable \TeX-electric-sub-and-superscript to a non-nil value.

\TeX-electric-sub-and-superscript [User Option]
If non-nil, insert braces after typing `^` and `_` in math mode.

You can automatically turn off input methods, used to input non-ascii characters, when you begin to enter math constructs.

\TeX-math-input-method-off-regexp [User Option]
Input method matching this regular expression is turned off when $ is typed to begin math mode or a math environment is inserted by C-c C-e (LaTeX-environment).
2.6 Completion

Emacs lisp programmers probably know the `lisp-complete-symbol` command which was bound to `M-TAB` until completion-at-point became the new standard completion facility (see below). Users of the wonderful ispell mode know and love the `ispell-complete-word` command from that package. Similarly, AUCTeX has a `TeX-complete-symbol` command, by default bound to `M-TAB` which is equivalent to `C-M-i`. Using `TeX-complete-symbol` makes it easier to type and remember the names of long LaTeX macros.

In order to use `TeX-complete-symbol`, you should write a backslash and the start of the macro. Typing `M-TAB` will now complete as much of the macro, as it unambiguously can. For example, if you type `\renewc` and then `M-TAB`, it will expand to `\renewcommand`. But there’s more: if point is just after `\begin{`, then `TeX-complete-symbol` will complete LaTeX environments, etc. This is controlled by `TeX-complete-list`.

TeX-complete-symbol

(M-TAB) Complete TeX symbol before point.

TeX-complete-list

List of ways to complete the preceding text.

Each entry is a list with the following elements:

1. Regexp matching the preceding text or a predicate of arity 0 which returns non-
nil and sets ‘match-data’ appropriately if it is applicable.
2. A number indicating the subgroup in the regexp containing the text.
3. A function returning an alist of possible completions.
4. Text to append after a successful completion.

Or alternatively:

1. Regexp matching the preceding text.
2. Function to do the actual completion.

More recent Emacs versions have a new completion mechanism. Modes may define and register custom `completion-at-point` functions and when the user invokes `completion-at-point` (usually bound to `M-TAB`), all such registered functions are consulted for checking for possible completions. Modern completion UIs like `company-mode` or `corfu` support this completion-at-point facility.

TeX--completion-at-point

AUCTeX’s completion-at-point function which is automatically added to `completion-at-point-functions` in TeX and LaTeX buffers.

It offers the same completion candidates as would `TeX-complete-symbol` (and is also controlled by `TeX-complete-list`) except that it doesn’t fall back on `ispell-complete-word` which would be awkward with completion UIs like `company-mode`.

LaTeX--arguments-completion-at-point

AUCTeX’s completion-at-point function inside arguments which is automatically added to `completion-at-point-functions` in LaTeX buffers.

It offers the completion candidates stored in the variables `TeX-symbol-list` and `LaTeX-environment-list` for single candidate, multiple candidates separated by commas, or key-value candidates separated by commas and/or equal signs.
A more direct way to insert a macro is with TeX-insert-macro, bound to \texttt{C-c \texttt{C-m}} which is equivalent to \texttt{C-c RET}. It has the advantage over completion that it knows about the argument of most standard \LaTeX\ macros, and will prompt for them. It also knows about the type of the arguments, so it will for example give completion for the argument to \texttt{\textbackslash include}'. Some examples are listed below.

**TeX-insert-macro**  
\texttt{[Command]}  
\texttt{(C-c \texttt{C-m} or \texttt{C-c RET})} Prompt (with completion) for the name of a \TeX\ macro, and if AUCTeX knows the macro, prompt for each argument.

As a default selection, AUCTeX will suggest the macro last inserted or, as the first choice the value of the variable \texttt{TeX-default-macro}.

**TeX-default-macro**  
\texttt{[User Option]}  
Default macro to insert when invoking \texttt{TeX-insert-macro} first time.

**TeX-insert-macro-default-style**  
\texttt{[User Option]}  
Specifies whether \texttt{TeX-insert-macro} will ask for all optional arguments. 
If set to the symbol \texttt{show-optional-args}, \texttt{TeX-insert-macro} asks for optional arguments of \TeX\ macros, unless the previous optional argument has been rejected. 
If set to \texttt{show-all-optional-args}, \texttt{TeX-insert-macro} asks for all optional arguments. \texttt{mandatory-args-only}, \texttt{TeX-insert-macro} asks only for mandatory arguments. When \texttt{TeX-insert-macro} is called with prefix argument (\texttt{C-u}), it’s the other way round.

Note that for some macros, there are special mechanisms, e.g. \texttt{TeX-arg-cite-note-p} and \texttt{LaTeX-includegraphics-options-alist}.

A faster alternative is to enable the option \texttt{TeX-electric-escape}.

**TeX-electric-escape**  
\texttt{[User Option]}  
If this is non-nil, typing the \TeX\ escape character \texttt{\textbackslash} will invoke the command \texttt{TeX-electric-macro}.

In Texinfo mode, the command is invoked by \texttt{@} instead.

The difference between \texttt{TeX-insert-macro} and \texttt{TeX-electric-macro} is that space key \texttt{SPC} will complete and exit from the minibuffer in \texttt{TeX-electric-macro}. Use \texttt{TAB} if you merely want to complete.

**TeX-electric-macro**  
\texttt{[Command]}  
Prompt (with completion) for the name of a \TeX\ macro, and if AUCTeX knows the macro, prompt for each argument. Space (\texttt{SPC}) will complete and exit.

By default AUCTeX will put an empty set braces ‘\{\}' after a macro with no arguments to stop it from eating the next whitespace. This is suppressed inside math mode and can be disabled totally by setting \texttt{TeX-insert-braces} to \texttt{nil}.

**TeX-insert-braces**  
\texttt{[User Option]}  
If non-nil, append a empty pair of braces after inserting a macro with no arguments.
TeX-insert-braces-alist

[User Option]

Control the insertion of a pair of braces after a macro on a per macro basis.

This variable is an alist. Each element is a cons cell, whose car is the macro name, and the cdr is non-nil or nil, depending on whether a pair of braces should be, respectively, appended or not to the macro.

If a macro has an element in this variable, AUCTeX will use its value to decide what to do, whatever the value of the variable TeX-insert-braces.

Completions work because AUCTeX can analyze \TeX files, and store symbols in Emacs Lisp files for later retrieval. See Section 5.5 [Automatic], page 80, for more information.

AUCTeX distinguishes normal and expert macros. By default, it will offer completion only for normal commands. This behavior can be controlled using the user option TeX-complete-expert-commands.

TeX-complete-expert-commands

[User Option]

Complete macros and environments marked as expert commands.

Possible values are nil, t, or a list of style names.

nil Don’t complete expert commands (default).

t Always complete expert commands.

(styles . .)

Only complete expert commands of styles.

AUCTeX will also make completion for many macro arguments, for example existing labels when you enter a ‘\ref’ macro with TeX-insert-macro or TeX-electric-macro, and Bib\TeX entries when you enter a ‘\cite’ macro. For this kind of completion to work, parsing must be enabled as described in Section 5.3 [Parsing Files], page 73. For ‘\cite’ you must also make sure that the Bib\TeX files have been saved at least once after you enabled automatic parsing on save, and that the basename of the Bib\TeX file does not conflict with the basename of one of \TeX files.

2.7 Marking Environments, Sections, or Texinfo Nodes

You can mark the current environment by typing \texttt{C-c .}, or the current section by typing \texttt{C-c *}.

In Texinfo documents you can type \texttt{C-M-h} to mark the current node.

When the region is set, the point is moved to its beginning and the mark to its end.

2.7.1 \LaTeX Commands for Marking Environments and Sections

LaTeX-mark-section

[Command]

(C-* *) Set mark at end of current logical section, and point at top.

With a non-nil prefix argument, mark only the region from the current section start to the next sectioning command. Thereby subsections are not being marked. Otherwise, any included subsections are also marked along with current section.
2.7.2 Texinfo Commands for Marking Environments and Sections

**Texinfo-mark-section**  
(\texttt{C-c \textasteriskcentered}) Mark the current section, with inclusion of any containing node.

The current section is detected as starting by any of the structuring commands matched by the regular expression in the variable \texttt{outline-regexp} which in turn is a regular expression matching any element of the variable \texttt{texinfo-section-list}.

With a non-nil prefix argument, mark only the region from the current section start to the next sectioning command. Thereby subsections are not being marked. Otherwise, any included subsections are also marked.

Note that when the current section is starting immediately after a node command, then the node command is also marked as part of the section.

**Texinfo-mark-environment**  
(\texttt{C-c .}) Set mark to the end of the current environment and point to the matching beginning.

If a prefix argument is given, mark the respective number of enclosing environments. The command will not work properly if there are unbalanced begin-end pairs in comments and verbatim environments.

**Texinfo-mark-node**  
(\texttt{C-M-h}) Mark the current node. This is the node in which point is located. It is starting at the previous occurrence of the keyword \texttt{@node} and ending at next occurrence of the keywords \texttt{@node} or \texttt{@bye}.

2.8 Commenting

It is often necessary to comment out temporarily a region of \TeX or \LaTeX code. This can be done with the commands \texttt{C-c ;} and \texttt{C-c \textpercent}. \texttt{C-c ;} will comment out all lines in the current region, while \texttt{C-c \textpercent} will comment out the current paragraph. Type \texttt{C-c ;} again to uncomment all lines of a commented region, or \texttt{C-c \textpercent} again to uncomment all comment lines around point. These commands will insert or remove a single \textquoteleft\textquoteleft \textpercent\textquoteleft\textquoteleft respectively.

**TeX-comment-or-uncomment-region**  
(\texttt{C-c ;}) Add or remove \textquoteleft\textquoteleft \textpercent\textquoteleft\textquoteleft from the beginning of each line in the current region. Uncommenting works only if the region encloses solely commented lines. If AUCTeX should not try to guess if the region should be commented or uncommented the commands \texttt{TeX-comment-region} and \texttt{TeX-uncomment-region} can be used to explicitly comment or uncomment the region in concern.
2.9 Indenting

Indentation means the addition of whitespace at the beginning of lines to reflect special syntactical constructs. This makes it easier to see the structure of the document, and to catch errors such as a missing closing brace. Thus, the indentation is done for precisely the same reasons that you would indent ordinary computer programs.

Indentation is done by \LaTeX{} environments and by \TeX{} groups, that is the body of an environment is indented by the value of $\texttt{LaTeX-indent-level}$ (default 2). Also, items of an ‘itemize-like’ environment are indented by the value of $\texttt{LaTeX-item-indent}$, default $-2$. (Items are identified with the help of $\texttt{LaTeX-item-regexp}$.) If more environments are nested, they are indented ‘accumulated’ just like most programming languages usually are seen indented in nested constructs.

You can explicitly indent single lines, usually by pressing \texttt{TAB}, or marked regions by calling \texttt{indent-region} on it. If you have \texttt{auto-fill-mode} enabled and a line is broken while you type it, Emacs automatically cares about the indentation in the following line. If you want to have a similar behavior upon typing \texttt{RET}, you can customize the variable \texttt{TeX-newline-function} and change the default of \texttt{newline} which does no indentation to \texttt{newline-and-indent} which indents the new line or \texttt{reindent-then-newline-and-indent} which indents both the current and the new line.

There are certain \LaTeX{} environments which should be indented in a special way, like ‘\texttt{tabular}’ or ‘\texttt{verbatim}’. Those environments may be specified in the variable $\texttt{LaTeX-indent-environment-list}$ together with their special indentation functions. Taking the ‘\texttt{verbatim}’ environment as an example you can see that $\texttt{current-indentation}$ is used as the indentation function. This will stop \AUCTeX{} from doing any indentation in the environment if you hit \texttt{TAB} for example.

There are environments in $\texttt{LaTeX-indent-environment-list}$ which do not bring a special indentation function with them. This is due to the fact that first the respective functions are not implemented yet and second that filling will be disabled for the specified environments. This shall prevent the source code from being messed up by accidently filling those environments with the standard filling routine. If you think that providing special filling routines for such environments would be an appropriate and challenging task for you, you are invited to contribute. (See Section 2.10 [\texttt{Filling}], page 39, for further information about the filling functionality.)

The check for the indentation function may be enabled or disabled by customizing the variable $\texttt{LaTeX-indent-environment-check}$.

For tabular-like environments, \AUCTeX{} has a built-in function to indent according to preceding ‘&’ signs and assigns it to all known tabular-like environments in the default value of $\texttt{LaTeX-indent-environment-list}$.

As a side note with regard to formatting special environments: Newer Emacsen include \texttt{align.el} and therefore provide some support for formatting ‘tabular’ and ‘tabbing’ en-
environments with the function `align-current` which will nicely align columns in the source code.

AUCTeX is able to format commented parts of your code just as any other part. This means \LaTeX\ environments and \TeX\ groups in comments will be indented syntactically correct if the variable `LaTeX-syntactic-comments` is set to `t`. If you disable it, comments will be filled like normal text and no syntactic indentation will be done.

Following you will find a list of most commands and variables related to indenting with a small summary in each case:

- **TAB** `LaTeX-indent-line` will indent the current line.
- **LFD** `newline-and-indent` inserts a new line (much like `RET`) and moves the cursor to an appropriate position by the left margin.
- **C-j** `newline-and-indent` inserts a new line (much like `RET`) and moves the cursor to an appropriate position by the left margin.

Most keyboards nowadays lack a linefeed key and `C-j` may be tedious to type. Therefore you can customize AUCTeX to perform indentation upon typing `RET` as well. The respective option is called `TeX-newline-function`.

- **LaTeX-indent-environment-list** [User Option]
  List of environments with special indentation. The second element in each entry is the function to calculate the indentation level in columns.

- **LaTeX-indent-level** [User Option]
  Number of spaces to add to the indentation for each `\begin` not matched by a `\end`.

- **LaTeX-item-indent** [User Option]
  Number of spaces to add to the indentation for `\item`'s in list environments.

- **TeX-brace-indent-level** [User Option]
  Number of spaces to add to the indentation for each `{` not matched by a `}`.

- **LaTeX-syntactic-comments** [User Option]
  If non-nil comments will be filled and indented according to \LaTeX\ syntax. Otherwise they will be filled like normal text.

- **TeX-newline-function** [User Option]
  Used to specify the function which is called when `RET` is pressed. This will normally be `newline` which simply inserts a new line. In case you want to have AUCTeX do indentation as well when you press `RET`, use the built-in functions `newline-and-indent` or `reindent-then-newline-and-indent`. The former inserts a new line and indents the following line, i.e. it moves the cursor to the right position and therefore acts as if you pressed `LFD`. The latter function additionally indents the current line. If you choose `'Other'`, you can specify your own fancy function to be called when `RET` is pressed.

AUCTeX treats by default `\[...\]` math mode as a regular environment and indents it accordingly. If you do not like such behavior you only need to remove `\[\[` and `\]` from `LaTeX-begin-regexp` and `LaTeX-end-regexp` variables respectively.

A closely related topic is indenting of text enclosed in square brackets, parentheses and other pairs. AUCTeX offers two variables which control if indentation happens inside these pairs.
TeX-indent-open-delimiters

This variable contains additional opening delimiters which increase indentation. For example add \[ to this variable to get text after a square bracket indented.

TeX-indent-close-delimiters

This is the accompanying variable to TeX-indent-open-delimiters decreasing the indentation again. This variable should contain ] if TeX-indent-open-delimiters is set like described above.

Note that this is an opt-in feature, both variables are initially set to an empty string. That is because it introduces non-trivial side effects to include \[ and ] in TeX-indent-open-delimiters and TeX-indent-close-delimiters; if you only have an opening square bracket in your text without closing it, wrong indentation persists in the following text. For example, in math expression, half-open intervals are frequently written as \([0,10)\) or \([0,10]\). In such cases, you can put the closing part as a comment in the same line in order to have correct indentation after that:

```
\[0,10)\ % ]
\[0,10[\ % ]
```

Another example is \(\texttt{\textbackslash left} - \texttt{\textbackslash right}\) pair in equations. Similar workarounds are available:

```
\begin{equation}
\texttt{\textbackslash left} % ]
xyz
\texttt{\textbackslash right}] % [
abc
\end{equation}
```

You can include parens \(\texttt{(}\) also in TeX-indent-open-delimiters and TeX-indent-close-delimiters to enable indent inside them. Be prepared for similar side effects when you do.

Note that commented curly braces \{ and \} aren’t counted when AUCTeX computes indentation.

In docTeX-mode, TeX code is enclosed in ‘macrocode’ environment like this:

```
% \begin{macrocode}
\def\foo#1{%
  $#1$
}%
\end{macrocode}
```

Sometimes, the code is long and one wants to insert comments inside the TeX code like this:

```
% \begin{macrocode}
\def\foo#1{%
  % \end{macrocode}
  % Comment the next line of code
  % \begin{macrocode}
  $#1$
}%
```
Usually, the comment inside the code interrupts the indentation. This behavior can be controlled by setting the variable `docTeX-indent-across-comments`.

`docTeX-indent-across-comments` [User Option]
If non-nil, indentation in docTeX is done across comments. This option is disabled by default.

### 2.10 Filling

Filling deals with the insertion of line breaks to prevent lines from becoming wider than what is specified in `fill-column`. The linebreaks will be inserted automatically if `auto-fill-mode` is enabled. In this case the source is not only filled but also indented automatically as you write it.

`auto-fill-mode` can be enabled for AUCTeX by calling `turn-on-auto-fill` in one of the hooks AUCTeX is running. See Section 5.1 [Modes and Hooks], page 71. As an example, if you want to enable `auto-fill-mode` in `LaTeX-mode`, put the following into your init file:

```lisp
(add-hook 'LaTeX-mode-hook #'turn-on-auto-fill)
```

You can manually fill explicitly marked regions, paragraphs, environments, complete sections, or the whole buffer. (Note that manual filling in AUCTeX will indent the start of the region to be filled in contrast to many other Emacs modes.)

There are some syntactical constructs which are handled specially with regard to filling. These are so-called code comments and paragraph commands.

Code comments are comments preceded by code or text in the same line. Upon filling a region, code comments themselves will not get filled. Filling is done from the start of the region to the line with the code comment and continues after it. In order to prevent overfull lines in the source code, a linebreak will be inserted before the last non-comment word by default. This can be changed by customizing `LaTeX-fill-break-before-code-comments`. If you have overfull lines with code comments you can fill those explicitly by calling `LaTeX-fill-paragraph` or pressing `M-q` with the cursor positioned on them. This will add linebreaks in the comment and indent subsequent comment lines to the column of the comment in the first line of the code comment. In this special case `M-q` only acts on the current line and not on the whole paragraph.

Lines with `\par` are treated similarly to code comments, i.e. `\par` will be treated as paragraph boundary which should not be followed by other code or text. But it is not treated as a real paragraph boundary like an empty line where filling a paragraph would stop.

Paragraph commands like `\section` or `\noindent` (the list of commands is defined by `LaTeX-paragraph-commands`) are often to be placed in their own line(s). This means they should not be consecuted with any preceding or following adjacent lines of text. AUCTeX will prevent this from happening if you do not put any text except another macro after the end of the last brace of the respective macro. If there is other text after the macro, AUCTeX regards this as a sign that the macro is part of the following paragraph.

Here are some examples:

\begin{quote}
\begin{quote}\label{foo}
text text text text
\end{quote}

If you press \texttt{M-q} on the first line in both examples, nothing will change. But if you write
\begin{quote}
text text text text
\end{quote}
and press \texttt{M-q}, you will get
\begin{quote}
text text text text text
\end{quote}

Besides code comments and paragraph commands, another speciality of filling in AUCTeX involves commented lines. You should be aware that these comments are treated as islands in the rest of the TeX code if syntactic filling is enabled. This means, for example, if you try to fill an environment with \texttt{LaTeX-fill-environment} and have the cursor placed on a commented line which does not have a surrounding environment inside the comment, AUCTeX will report an error.

The relevant commands and variables with regard to filling are:

\texttt{C-c C-q C-p}
\begin{itemize}
\item \texttt{LaTeX-fill-paragraph} will fill and indent the current paragraph.
\end{itemize}

\texttt{M-q}
\begin{itemize}
\item Alias for \texttt{C-c C-q C-p}
\end{itemize}

\texttt{C-c C-q C-e}
\begin{itemize}
\item \texttt{LaTeX-fill-environment} will fill and indent the current environment. This may e.g. be the ‘document’ environment, in which case the entire document will be formatted.
\end{itemize}

\texttt{C-c C-q C-s}
\begin{itemize}
\item \texttt{LaTeX-fill-section} will fill and indent the current logical sectional unit.
\end{itemize}

\texttt{C-c C-q C-r}
\begin{itemize}
\item \texttt{LaTeX-fill-region} will fill and indent the current region.
\end{itemize}

\texttt{LaTeX-fill-break-at-separators} [User Option]
\begin{itemize}
\item List of separators before or after which respectively linebreaks will be inserted if they do not fit into one line. The separators can be curly braces, brackets, switches for inline math (‘\$', ‘\{’, ‘\}’) and switches for display math (‘\[’, ‘\]’). Such formatting can be useful to make macros and math more visible or to prevent overfull lines in the TeX source in case a package for displaying formatted TeX output inside the Emacs buffer, like preview-latex, is used.
\end{itemize}

\texttt{LaTeX-fill-break-before-code-comments} [User Option]
\begin{itemize}
\item Code comments are comments preceded by some other text in the same line. When a paragraph containing such a comment is to be filled, the comment start will be seen as a border after which no line breaks will be inserted in the same line. If the option \texttt{LaTeX-fill-break-before-code-comments} is enabled (which is the default) and the comment does not fit into the line, a line break will be inserted before the last non-comment word to minimize the chance that the line becomes overfull.
\end{itemize}
LaTeX-fill-excluded-macros

A list of macro names (without leading backslash) for whose arguments filling should be disabled. Typically, you will want to add macros here which have long, multi-line arguments. An example is \texttt{\pgfplotstabletypeset} from the \texttt{pgfplotstable} package which is used as shown in the following listing:

\begin{verbatim}
\pgfplotstabletypeset[skip first n=4]{
  XYZ Format,
  Version 1.234
  Date 2010-09-01
  \@author Mustermann
  A B C
  1 2 3
  4 5 6
}
\end{verbatim}
3 Controlling Screen Display

It is often desirable to get visual help of what markup code in a text actually does without having to decipher it explicitly. For this purpose Emacs and \texttt{AUCT\TeX} provide font locking (also known as syntax highlighting) which visually sets off markup code like macros or environments by using different colors or fonts. For example text to be typeset in italics can be displayed with an italic font in the editor as well, or labels and references get their own distinct color.

While font locking helps you grasp the purpose of markup code and separate markup from content, the markup code can still be distracting. \texttt{AUCT\TeX} lets you hide those parts and show them again at request with its built-in support for hiding macros and environments which we call folding here.

Besides folding of macros and environments, \texttt{AUCT\TeX} provides support for Emacs' outline mode which lets you narrow the buffer content to certain sections of your text by hiding the parts not belonging to these sections.

Moreover, you can focus in a specific portion of the code by narrowing the buffer to the desired region. \texttt{AUCT\TeX} provides also functions to narrow the buffer to the current group and to \LaTeX{} environments.

\texttt{AUCT\TeX} also provides some WYSIWYG features.

First, you can customize \texttt{font-latex-fontify-script} to enable special formatting of ^ superscripts and _ subscripts (see Section 3.1 [Font Locking], page 42).

Secondly, \texttt{AUCT\TeX} with GNU Emacs 25 or later can display certain math macros using Unicode characters, e.g., \texttt{\alpha} as $\alpha$. This is called prettification and is lightweight and reasonable robust (see Section 3.5 [Prettifying], page 53).

A more accurate approach is provided by \texttt{preview-latex}, a subsystem of \texttt{AUCT\TeX}, see Section “Introduction” in \texttt{The preview-latex Manual}. This system uses \LaTeX{} to generate images that are then displayed in your buffer. It is extremely accurate but can be fragile with some packages (like older pgf versions).

Please note that you can use prettification and \texttt{preview-latex} together.

3.1 Font Locking

Font locking is supposed to improve readability of the source code by highlighting certain keywords with different colors or fonts. It thereby lets you recognize the function of markup code to a certain extent without having to read the markup command. For general information on controlling font locking with Emacs’ Font Lock mode, see Section “Font Lock Mode” in \texttt{GNU Emacs Manual}.

\texttt{TeX-install-font-lock} \hfill [User Option]

Once font locking is enabled globally or for the major modes provided by \texttt{AUCT\TeX}, the font locking patterns and functionality of \texttt{font-latex} are activated by default. You can switch to a different font locking scheme or disable font locking in \texttt{AUCT\TeX} by customizing the variable \texttt{TeX-install-font-lock}.

Besides \texttt{font-latex} \texttt{AUCT\TeX} ships with a scheme which is derived from Emacs’ default \LaTeX{} mode and activated by choosing \texttt{tex-font-setup}. Be aware that this scheme is
Chapter 3: Controlling Screen Display

not coupled with AUCTeX’s style system and not the focus of development. Therefore and due to font-latex being much more feature-rich the following explanations will only cover font-latex.

In case you want to hook in your own fontification scheme, you can choose other and insert the name of the function which sets up your font locking patterns. If you want to disable fontification in AUCTeX completely, choose ignore.

font-latex provides many options for customization which are accessible with M-x customize-group RET font-latex RET. For this description the various options are explained in conceptional groups.

3.1.1 Fontification of macros

Highlighting of macros can be customized by adapting keyword lists which can be found in the customization group font-latex-keywords.

Three types of macros can be handled differently with respect to fontification:

1. Commands of the form ‘\foo[bar]{baz}’ which consist of the macro itself, optional arguments in square brackets and mandatory arguments in curly braces. For the command itself the face font-lock-keyword-face will be used and for the optional arguments the face font-lock-variable-name-face. The face applied to the mandatory argument depends on the macro class represented by the respective built-in variables.

2. Declaration macros of the form ‘\{\foo text}’ which consist of the macro which may be enclosed in a TeX group together with text to be affected by the macro. In case a TeX group is present, the macro will get the face font-lock-keyword-face and the text will get the face configured for the respective macro class. If no TeX group is present, the latter face will be applied to the macro itself.

3. Simple macros of the form ‘\foo’ which do not have any arguments or groupings. The respective face will be applied to the macro itself.

Customization variables for ‘\foo[bar]{baz}’ type macros allow both the macro name and the sequence of arguments to be specified. The latter is done with a string which can contain the characters

‘*’ indicating the existence of a starred variant for the macro,

‘[’ for optional arguments in brackets,

‘{’ for mandatory arguments in braces,

‘\’ for mandatory arguments consisting of a single macro and

‘|’ as a prefix indicating that two alternatives are following.

For example the specifier for ‘\documentclass’ would be ‘[\{} because the macro has one optional followed by one mandatory argument. The specifier for ‘\newcommand’ would be ‘*|\{{\}’ because there is a starred variant, the mandatory argument following the macro name can be a macro or a TeX group which can be followed by two optional arguments and the last token is a mandatory argument in braces.

Customization variables for the ‘{\foo text}’ and ‘\foo’ types are simple lists of strings where each entry is a macro name (without the leading backslash).
General macro classes

font-latex provides keyword lists for different macro classes which are described in the following table:

\texttt{font-latex-match-function-keywords}

- Keywords for macros defining or related to functions, like ‘\texttt{\newcommand}’.
- Type: ‘\texttt{\macro[...]{...}}’
- Face: \texttt{font-lock-function-name-face}

\texttt{font-latex-match-reference-keywords}

- Keywords for macros defining or related to references, like ‘\texttt{\ref}’.
- Type: ‘\texttt{\macro[...]{...}}’
- Face: \texttt{font-lock-constant-face}

\texttt{font-latex-match-textual-keywords}

- Keywords for macros specifying textual content, like ‘\texttt{\caption}’.
- Type: ‘\texttt{\macro[...]{...}}’
- Face: \texttt{font-lock-type-face}

\texttt{font-latex-match-variable-keywords}

- Keywords for macros defining or related to variables, like ‘\texttt{\setlength}’.
- Type: ‘\texttt{\macro[...]{...}}’
- Face: \texttt{font-lock-variable-name-face}

\texttt{font-latex-match-warning-keywords}

- Keywords for important macros, e.g. affecting line or page break, like ‘\texttt{\clearpage}’.
- Type: ‘\texttt{\macro}’
- Face: \texttt{font-latex-warning-face}

Sectioning commands

Sectioning commands are macros like ‘\texttt{\chapter}’ or ‘\texttt{\section}’. For these commands there are two fontification schemes which may be selected by customizing the variable \texttt{font-latex-fontify-sectioning}.

\texttt{font-latex-fontify-sectioning} \texttt{[User Option]}

Per default sectioning commands will be shown in a larger, proportional font, which corresponds to a number for this variable. The font size varies with the sectioning level, e.g. ‘\texttt{\part}’ (\texttt{font-latex-sectioning-0-face}) has a larger font than ‘\texttt{\paragraph}’ (\texttt{font-latex-sectioning-5-face}). Typically, values from 1.05 to 1.3 for \texttt{font-latex-fontify-sectioning} give best results, depending on your font setup. If you rather like to use the base font and a different color, set the variable to the symbol ‘\texttt{color}’. In this case the face \texttt{font-lock-type-face} will be used to fontify the argument of the sectioning commands.

You can make font-latex aware of your own sectioning commands by adding them to the keyword lists: \texttt{font-latex-match-sectioning-0-keywords} (\texttt{font-latex-sectioning-0-face}) \ldots \texttt{font-latex-match-sectioning-5-keywords} (\texttt{font-latex-sectioning-5-face}).
Related to sectioning there is special support for slide titles which may be fontified with the face \texttt{font-latex-slide-title-face}. You can add macros which should appear in this face by customizing the variable \texttt{font-latex-match-slide-title-keywords}.

**Commands for changing fonts**

\LaTeX provides various macros for changing fonts or font attributes. For example, you can select an italic font with \texttt{\textit{...}} or bold with \texttt{\textbf{...}}. An alternative way to specify these fonts is to use special macros in \TeX groups, like \texttt{\itshape ...} for italics and \texttt{\bfseries ...} for bold. As mentioned above, we call the former variants commands and the latter declarations.

Besides the macros for changing fonts provided by \LaTeX there is an infinite number of other macros—either defined by yourself for logical markup or defined by macro packages—which affect the font in the typeset text. While \LaTeX’s built-in macros and macros of packages known by AUCTeX are already handled by \texttt{font-latex}, different keyword lists per type style and macro type are provided for entering your own macros which are listed in the table below.

\begin{verbatim}
\texttt{font-latex-match-bold-command-keywords}
  Keywords for commands specifying a bold type style.
  Face: \texttt{font-latex-bold-face}

\texttt{font-latex-match-italic-command-keywords}
  Keywords for commands specifying an italic font.
  Face: \texttt{font-latex-italic-face}

\texttt{font-latex-match-underline-command-keywords}
  Keywords for commands specifying an underlined text.
  Face: \texttt{font-latex-underline-face}

\texttt{font-latex-match-math-command-keywords}
  Keywords for commands specifying a math font.
  Face: \texttt{font-latex-math-face}

\texttt{font-latex-match-type-command-keywords}
  Keywords for commands specifying a typewriter font.
  Face: \texttt{font-lock-type-face}

\texttt{font-latex-match-bold-declaration-keywords}
  Keywords for declarations specifying a bold type style.
  Face: \texttt{font-latex-bold-face}

\texttt{font-latex-match-italic-declaration-keywords}
  Keywords for declarations specifying an italic font.
  Face: \texttt{font-latex-italic-face}

\texttt{font-latex-match-type-declaration-keywords}
  Keywords for declarations specifying a typewriter font.
  Face: \texttt{font-latex-type-face}
\end{verbatim}
Deactivating defaults of built-in keyword classes

`font-latex` ships with predefined lists of keywords for the classes described above. You can disable these defaults per class by customizing the variable `font-latex-deactivated-keyword-classes`. This is a list of strings for keyword classes to be deactivated. Valid entries are "warning", "variable", "biblatexnoarg", "biblatex", "reference", "function", "function-noarg", "sectioning-0", "sectioning-1", "sectioning-2", "sectioning-3", "sectioning-4", "sectioning-5", "slide-title", "textual", "bold-command", "italic-command", "underline-command", "math-command", "type-command", "bold-declaration", "italic-declaration" or "type-declaration".

You can also get rid of certain keywords only. For example if you want to remove highlighting of footnotes as references you can put the following stanza into your init file:

```
(eval-after-load "font-latex"
 '(setq-default
   font-latex-match-reference-keywords-local
 (remove (assoc-string "footnote" 
           font-latex-match-reference-keywords-local)
           font-latex-match-reference-keywords-local)))
```

But note that this means fiddling with `font-latex`'s internals and is not guaranteed to work in future versions of `font-latex`.

User-defined keyword classes

In case the customization options explained above do not suffice for your needs, you can specify your own keyword classes by customizing the variable `font-latex-user-keyword-classes`.

```
[User Option]
font-latex-user-keyword-classes
```

Every keyword class consists of four parts, a name, a list of keywords, a face and a specifier for the type of macros to be highlighted.

When adding new entries, you have to use unique values for the class names, i.e. they must not clash with names of the built-in keyword classes or other names given by you. Additionally the names must not contain spaces.

The list of keywords defines which commands and declarations should be covered by the keyword class. A keyword can either be a simple command name omitting the leading backslash or a list consisting of the command name and a string specifying the sequence of arguments for the command.

The face argument can either be an existing face or face attributes made by you.

There are three alternatives for the type of keywords—“Command with arguments”, “Declaration inside \TeX group” and “Command without arguments”—which correspond with the macro types explained above.

3.1.2 Fontification of quotes

Text in quotation marks is displayed with the face `font-latex-string-face`. Besides the various forms of opening and closing double and single quotation marks, so-called guillemets (<<, >>) can be used for quoting. Because there are two styles of using them—French style: << text >>; German style: >>text<<—you can customize the variable `font-latex-quotes` to
tell \texttt{font-latex} which type you are using if the correct value cannot be derived from document properties.

\texttt{font-latex-quotes} \quad \textit{[User Option]}

The default value of \texttt{font-latex-quotes} is ‘auto’ which means that \texttt{font-latex} will try to derive the correct type of quotation mark matching from document properties like the language option supplied to the babel \LaTeX{} package.

If the automatic detection fails for you and you mostly use one specific style you can set it to a specific language-dependent value as well. Set the value to ‘\texttt{german}’ if you are using >>German quotes<< and to ‘\texttt{french}’ if you are using <<French quotes >>. \texttt{font-latex} will recognize the different ways these quotes can be given in your source code, i.e. (‘<’, ‘>’), (‘<<’, ‘>>’) and the respective 8-bit variants.

If you set \texttt{font-latex-quotes} to \texttt{nil}, quoted content will not be fontified.

### 3.1.3 Fontification of mathematical constructs

In \LaTeX{} mathematics can be indicated by a variety of different methods: toggles (like dollar signs), macros and environments. Math constructs known by \texttt{font-latex} are displayed with the face \texttt{font-latex-math-face}. Support for dollar signs and shorthands like ‘\textbackslash{(..\textbackslash{)}}’ or ‘\textbackslash{[..\textbackslash{]}}’ is built-in and not customizable. Support for other math macros and environments can be adapted by customizing the variables \texttt{font-latex-match-math-command-keywords} and \texttt{texmathp-tex-commands} respectively. It is no longer recommended to customize \texttt{font-latex-math-environments}.

To convert your customization in \texttt{font-latex-math-environments} into \texttt{texmathp-tex-commands}, please register your own math environments, together with starred variants if any, as entries of \texttt{env-on} type in \texttt{texmathp-tex-commands}, then clear out \texttt{font-latex-math-environments}. You have to restart Emacs for this new customization to take effect for fontification.

In order to make math constructs more readable, \texttt{font-latex} displays subscript and superscript parts in a smaller font and raised or lowered respectively. This fontification feature can be controlled with the variables \texttt{font-latex-fontify-script} and \texttt{font-latex-script-display}.

\texttt{font-latex-fontify-script} \quad \textit{[User Option]}

If non-\texttt{nil}, fontify subscript and superscript strings. Concretely, this means that the scripts are raised or lowered.

Another possibility is setting this variable to the symbol ‘\texttt{multi-level}’. In this case, in a formula $x^y z$, $y$ is raised above and smaller than $x$, and $z$ is raised above and smaller than $y$. With many script levels, the text might become too small to be readable. (See \texttt{font-latex-fontify-script-max-level} below.)

Lastly, you can set this variable to ‘\texttt{invisible}’ whose behavior is like \texttt{multi-level}, and in addition the super-/subscript characters ‘\texttt{^}’ and ‘\texttt{-}’ are not displayed.

\texttt{font-latex-fontify-script-max-level} \quad \textit{[User Option]}

Maximum scriptification level for which script faces are applied.

The faces \texttt{font-latex-superscript-face} and \texttt{font-latex-subscript-face} define custom \texttt{:height} values < 1.0. Therefore, scripts are displayed with a slightly smaller
font than normal math text. If \texttt{font-latex-fontify-script} is \texttt{multi-level} or \texttt{invisible}, the font size becomes too small to be readable after a few levels. This option allows to specify the maximum level after which the size of the script text won’t be shrunk anymore.

For example, in the expression $x^y^{z^a b}$, $x$ has scriptification level 0, $y$ has level 1, $z$ has level 2, and both $a$ and $b$ have scriptification level 3.

If \texttt{font-latex-fontify-script-max-level} was 2, then $z$, $a$, and $b$ would have the same font size. If it was 3 or more, then $a$ and $b$ were smaller than $z$ just in the same way as $z$ is smaller than $y$ and $y$ is smaller than $x$.

The script characters ‘^’ and ‘_’ themselves are also fontified with an own face named \texttt{font-latex-script-char-face}.

\texttt{font-latex-script-display} [User Option]

Display specification for subscript and superscript content. The car is used for subscript, the cdr is used for superscript. The feature is implemented using so-called display properties. For information on what exactly to specify for the values, see Section “Other Display Specifications” in \textit{GNU Emacs Lisp Reference Manual}.

### 3.1.4 Verbatim macros and environments

Usually it is not desirable to have content to be typeset verbatim highlighted according to \LaTeX{} syntax. Therefore this content will be fontified uniformly with the face \texttt{font-latex-verbatim-face}.

\texttt{font-latex} differentiates three different types of verbatim constructs for fontification. Macros with special characters like | as delimiters, macros with braces, and environments. Which macros and environments are recognized is controlled by the variables \texttt{LaTeX-verbatim-macros-with-delims}, \texttt{LaTeX-verbatim-macros-with-braces}, and \texttt{LaTeX-verbatim-environments} respectively.

### 3.1.5 Faces used by \texttt{font-latex}

In case you want to change the colors and fonts used by \texttt{font-latex} please refer to the faces mentioned in the explanations above and use \texttt{M-x customize-face RET \langle face\rangle RET}. All faces defined by \texttt{font-latex} are accessible through a customization group by typing \texttt{M-x customize-group RET font-latex-highlighting-faces RET}.

### 3.1.6 Known fontification problems

In certain cases the fontification machinery fails to interpret buffer contents correctly. This can lead to color bleed, i.e. large parts of a buffer get fontified with an inappropriate face. A typical situation for this to happen is the use of a dollar sign (‘$’) in a verbatim macro or environment. If \texttt{font-latex} is not aware of the verbatim construct, it assumes the dollar sign to be a toggle for mathematics and fontifies the following buffer content with the respective face until it finds a closing dollar sign or till the end of the buffer.

As a remedy you can make the verbatim construct known to \texttt{font-latex} (see Section 3.1.4 [Verbatim content], page 48). If this is not possible, you can insert a commented dollar sign (‘~\$’) at the next suitable end of line as a quick workaround. In \textsc{doc}TeX documents, ‘~\textasciitilde~\$’ is also available for similar purpose.
3.2 Folding Macros and Environments

A popular complaint about markup languages like T\TeX\ and L\AT\EX is that there is too much clutter in the source text and that one cannot focus well on the content. There are macros where you are only interested in the content they are enclosing, like font specifiers where the content might already be fontified in a special way by font locking. Or macros the content of which you only want to see when actually editing it, like footnotes or citations. Similarly you might find certain environments or comments distracting when trying to concentrate on the body of your document.

With AUCT\TeX’s folding functionality you can collapse those items and replace them by a fixed string, the content of one of their arguments, or a mixture of both. If you want to make the original text visible again in order to view or edit it, move point sideways onto the placeholder (also called display string) or left-click with the mouse pointer on it. The macro or environment will unfold automatically, stay open as long as point is inside of it and collapse again once you move point out of it. (Note that folding of environments currently does not work in every AUCT\TeX mode.)

In order to use this feature, you have to activate TeX-fold-mode which will activate the auto-reveal feature and the necessary commands to hide and show macros and environments. You can activate the mode in a certain buffer by typing the command M-x TeX-fold-mode RET or using the keyboard shortcut C-c C-o C-f. If you want to use it every time you edit a \LaTeX document, add it to a hook:

\begin{verbatim}
(add-hook 'LaTeX-mode-hook (lambda ()
  (TeX-fold-mode 1)))
\end{verbatim}

If it should be activated in all AUCT\TeX modes, use TeX-mode-hook instead of LaTeX-mode-hook.

Once the mode is active there are several commands available to hide and show macros, environments and comments:

**TeX-fold-buffer** [Command]
\begin{verbatim}
(C-c C-o C-b) Hide all foldable items in the current buffer according to the setting of TeX-fold-type-list.
\end{verbatim}

If you want to have this done automatically every time you open a file, add it to a hook and make sure the function is called after font locking is set up for the buffer. The following code should accomplish this:

\begin{verbatim}
(add-hook 'find-file-hook #'TeX-fold-buffer t)
\end{verbatim}

The command can be used any time to refresh the whole buffer and fold any new macros and environments which were inserted after the last invocation of the command.

**TeX-fold-type-list** [User Option]

List of symbols determining the item classes to consider for folding. This can be macros, environments and comments. Per default only macros and environments are folded.

**TeX-fold-force-fontify** [User Option]

In order for all folded content to get the right faces, the whole buffer has to be fontified before folding is carried out. TeX-fold-buffer therefore will force fontification of
unfontified regions. As this will prolong the time folding takes, you can prevent forced fontification by customizing the variable `TeX-fold-force-fontify`.

**TeX-fold-auto** [User Option]
By default, a macro inserted with `TeX-insert-macro` (`C-c C-m`) will not be folded. Set this variable to a non-nil value to automatically fold macros as soon as they are inserted.

**TeX-fold-preserve-comments** [User Option]
By default items found in comments will be folded. If your comments often contain unfinished code this might lead to problems. Give this variable a non-nil value and foldable items in your comments will be left alone.

**TeX-fold-unfold-around-mark** [User Option]
When this variable is non-nil and there is an active regione, text around the mark will be kept unfolded.

**TeX-fold-region** [Command]
`(C-c C-o C-r)` Hide all configured macros in the marked region.

**TeX-fold-paragraph** [Command]
`(C-c C-o C-p)` Hide all configured macros in the paragraph containing point.

**TeX-fold-macro** [Command]
`(C-c C-o C-m)` Hide the macro on which point currently is located. If the name of the macro is found in `TeX-fold-macro-spec-list`, the respective display string will be shown instead. If it is not found, the name of the macro in square brackets or the default string for unspecified macros (`TeX-fold-unspec-macro-display-string`) will be shown, depending on the value of the variable `TeX-fold-unspec-use-name`.

**TeX-fold-env** [Command]
`(C-c C-o C-e)` Hide the environment on which point currently is located. The behavior regarding the display string is analogous to `TeX-fold-macro` and determined by the variables `TeX-fold-env-spec-list` and `TeX-fold-unspec-env-display-string` respectively.

**TeX-fold-math** [Command]
Hide the math macro on which point currently is located. If the name of the macro is found in `TeX-fold-math-spec-list`, the respective display string will be shown instead. If it is not found, the name of the macro in square brackets or the default string for unspecified macros (`TeX-fold-unspec-macro-display-string`) will be shown, depending on the value of the variable `TeX-fold-unspec-use-name`.

**TeX-fold-comment** [Command]
`(C-c C-o C-c)` Hide the comment point is located on.

**TeX-fold-clearout-buffer** [Command]
`(C-c C-o b)` Permanently unfold all macros and environments in the current buffer.

**TeX-fold-clearout-region** [Command]
`(C-c C-o r)` Permanently unfold all macros and environments in the marked region.
**TeX-fold-clearout-paragraph**  
*(C-c C-o p)* Permanently unfold all macros and environments in the paragraph containing point.

**TeX-fold-clearout-item**  
*(C-c C-o i)* Permanently show the macro or environment on which point currently is located. In contrast to temporarily opening the macro when point is moved sideways onto it, the macro will be permanently unfolded and will not collapse again once point is leaving it.

**TeX-fold-dwim**  
*(C-c C-o C-o)* Hide or show items according to the current context. If there is folded content, unfold it. If there is a marked region, fold all configured content in this region. If there is no folded content but a macro or environment, fold it.

In case you want to use a different prefix than *C-c C-o* for these commands you can customize the variable **TeX-fold-command-prefix**. (Note that this will not change the key binding for activating the mode.)

The commands above will only take macros or environments into consideration which are specified in the variables **TeX-fold-macro-spec-list** or **TeX-fold-env-spec-list** respectively.

**TeX-fold-macro-spec-list**  
[User Option] List of replacement specifiers and macros to fold. The specifier can be a string, an integer or a function symbol.

If you specify a string, it will be used as a display replacement for the whole macro. Numbers in braces, brackets, parens or angle brackets will be replaced by the respective macro argument. For example ‘{1}’ will be replaced by the first mandatory argument of the macro. One can also define alternatives within the specifier which are used if an argument is not found. Alternatives are separated by ‘||’. They are most useful with optional arguments. As an example, the default specifier for ‘\item’ is ‘{1}:||*’ which means that if there is an optional argument, its value is shown followed by a colon. If there is no optional argument, only an asterisk is used as the display string.

If you specify a number as the first element, the content of the respective mandatory argument of a LaTeX macro will be used as the placeholder.

If the first element is a function symbol, the function will be called with all mandatory arguments of the macro and the result of the function call will be used as a replacement for the macro. Such functions typically return a string, but may also return the symbol *abort* to indicate that the macro should not be folded.

The placeholder is made by copying the text from the buffer together with its properties, i.e. its face as well. If fontification has not happened when this is done (e.g. because of lazy font locking) the intended fontification will not show up. As a workaround you can leave Emacs idle a few seconds and wait for stealth font locking to finish before you fold the buffer. Or you just re-fold the buffer with **TeX-fold-buffer** when you notice a wrong fontification.
Chapter 3: Controlling Screen Display

**TeX-fold-env-spec-list**

List of display strings or argument numbers and environments to fold. Argument numbers refer to the `'begin` statement. That means if you have e.g. `\begin{tabularx}{\linewidth}{XXX} ... \end{tabularx}` and specify 3 as the argument number, the resulting display string will be “XXX”.

**TeX-fold-math-spec-list**

List of display strings and math macros to fold.

The variables `TeX-fold-macro-spec-list`, `TeX-fold-env-spec-list`, and `TeX-fold-math-spec-list` apply to any AUCTeX mode. If you want to make settings which are only applied to LaTeX mode, you can use the mode-specific variables `LaTeX-fold-macro-spec-list`, `LaTeX-fold-env-spec-list`, and `LaTeX-fold-math-spec-list`.

**TeX-fold-unspec-macro-display-string**

Default display string for macros which are not specified in `TeX-fold-macro-spec-list`.

**TeX-fold-unspec-env-display-string**

Default display string for environments which are not specified in `TeX-fold-env-spec-list`.

**TeX-fold-unspec-use-name**

If non-nil the name of the macro or environment surrounded by square brackets is used as display string, otherwise the defaults specified in `TeX-fold-unspec-macro-display-string` or `TeX-fold-unspec-env-display-string` respectively.

When you hover with the mouse pointer over folded content, its original text will be shown in a tooltip or the echo area depending on Tooltip mode being activate. In order to avoid exorbitantly big tooltips and to cater for the limited space in the echo area the content will be cropped after a certain amount of characters defined by the variable `TeX-fold-help-echo-max-length`.

**TeX-fold-help-echo-max-length**

Maximum length of original text displayed in a tooltip or the echo area for folded content. Set it to zero in order to disable this feature.

### 3.3 Outlining the Document

AUCTeX supports the standard outline minor mode using LaTeX/ConTeXt sectioning commands as header lines. See Section “Outline Mode” in GNU Emacs Manual.

You can add your own headings by setting the variable `TeX-outline-extra`.

**TeX-outline-extra**

List of extra \TeX outline levels.

Each element is a list with two entries. The first entry is the regular expression matching a header, and the second is the level of the header. A `^` is automatically prepended to the regular expressions in the list, so they must match text at the beginning of the line.

See `LaTeX-section-list` or `ConTeXt-interface-section-list` for existing header levels.
The following example add `\item` and `\bibliography` headers, with `\bibliography` at the same outline level as `section`, and `\item` being below `\subparagraph`.

```
(setq TeX-outline-extra
  '([ \t]\*[\\\(bib\)]\?item\b" 7)
  ("\\bibliography\b" 2)))
```

You may want to check out the unbundled `out-xtra` package for even better outline support. It is available from your favorite emacs lisp archive.

### 3.4 Narrowing

Sometimes you want to focus your attention to a limited region of the code. You can do that by restricting the text addressable by editing commands and hiding the rest of the buffer with the narrowing functions, see Section “Narrowing” in GNU Emacs Manual. In addition, AUCTeX provides a couple of other commands to narrow the buffer to a group, i.e. a region enclosed in a pair of curly braces, and to LaTeX environments.

**TeX-narrow-to-group**

(C-x n g) Make text outside current group invisible.

**LaTeX-narrow-to-environment count**

(C-x n e) Make text outside current environment invisible. With optional argument count keep visible that number of enclosing environments.

Like other standard narrowing functions, the above commands are disabled. Attempting to use them asks for confirmation and gives you the option of enabling them; if you enable the commands, confirmation will no longer be required for them.

### 3.5 Prettifying

Emacs 25 is able to prettify symbols in programming language buffers, see Section “Misc for Programs” in GNU Emacs Manual. The canonical example is to display `(lambda () ...)` as `(\(\lambda () \ldots\))` in Lisp buffers.

AUCTeX can use this feature in order to display certain math macros and greek letters using their Unicode representation, too. For example, the TeX code `\alpha \times \beta` will be displayed as α × β. When point is on one of the characters, it’ll be unprettified automatically, meaning you see the verbatim text again. For this behaviour however you need to set `prettify-symbols-unpretify-at-point` to `t` or `right-edge` which will unpretify the symbol when point moves into or near it.

To enable prettification in AUCTeX, simply add `prettify-symbols-mode` to `TeX-mode-hook`. If you enabled prettification globally with `global-prettify-symbols-mode`, then it’s automatically enabled in AUCTeX, too.

You can also add custom symbol unicode-character pairs for prettification by adding to `tex--prettify-symbols-alist`. Note that this variable is part of Emacs’ stock `tex-mode.el` and used by that and AUCTeX.
4 Starting Processors, Viewers and Other Programs

The most powerful features of AUCTeX may be those allowing you to run \TeX, \LaTeX, Con\TeXt and other external commands like Bib\TeX and \texttt{makeindex} from within Emacs, viewing and printing the results, and moreover allowing you to \textit{debug} your documents.

\LaTeX comes with a special tool bar for \TeX and \LaTeX which provides buttons for the most important commands. You can enable or disable it by customizing the options \texttt{plain-Tex-enable-toolbar} and \texttt{LaTeX-enable-toolbar} in the TeX-tool-bar customization group. You can also customize the buttons by the options \texttt{TeX-bar-Tex-buttons}, \texttt{TeX-bar-LaTeX-buttons}, \texttt{TeX-bar-LaTeX-all-button-alists}, \texttt{TeX-bar-LaTeX-buttons} and \texttt{TeX-bar-LaTeX-button-alist}.

4.1 Executing Commands

Formatting the document with \TeX, \LaTeX or Con\TeXt, viewing with a previewer, printing the document, running Bib\TeX, making an index, or checking the document with \texttt{lacheck} or \texttt{chktex} all require running an external command.

4.1.1 Starting a Command on a Document or Region

There are two ways to run an external command, you can either run it on the current document with \texttt{TeX-command-master}, or on the current region with \texttt{TeX-command-region}.

A special case of running \TeX on a region is \texttt{TeX-command-buffer} which differs from \texttt{TeX-command-master} if the current buffer is not its own master file.

\texttt{TeX-command-master} \hfill [Command]

\texttt{(C-c C-c)} Query the user for a command, and run it on the master file associated with the current buffer. The name of the master file is controlled by the variable \texttt{TeX-master}. The available commands are controlled by the variable \texttt{TeX-command-list}.

\texttt{TeX-command-region} \hfill [Command]

\texttt{(C-c C-r)} Query the user for a command, and run it on the contents of the selected region. The region contents are written into the region file, after extracting the header and trailer from the master file. If mark is inactive (which can happen with Transient Mark mode), use the old region. See also the command \texttt{TeX-pin-region} about how to fix a region.

The name of the region file is controlled by the variable \texttt{TeX-region}. The name of the master file is controlled by the variable \texttt{TeX-master}. The header is all text up to the line matching the regular expression \texttt{TeX-header-end}. The trailer is all text from the line matching the regular expression \texttt{TeX-trailer-start}. The available commands are controlled by the variable \texttt{TeX-command-list}.

\texttt{TeX-command-buffer} \hfill [Command]

\texttt{(C-c C-b)} Query the user for a command, and apply it to the contents of the current buffer. The buffer contents are written into the region file, after extracting the header and trailer from the master file. The command is then actually run on the region file. See above for details.

\texttt{LaTeX-command-section} \hfill [Command]

\texttt{(C-c C-z)} Query the user for a command, and apply it to the current section (or part, chapter, subsection, paragraph, or subparagraph). What makes the current section
is determined by \texttt{LaTeX-command-section-level} which can be enlarged/shrunken using \texttt{LaTeX-command-section-change-level} (\texttt{C-c M-z}). The given numeric prefix arg is added to the current value of \texttt{LaTeX-command-section-level}. By default, \texttt{LaTeX-command-section-level} is initialized with the current document's \texttt{LaTeX-largest-level}. The buffer contents are written into the region file, after extracting the header and trailer from the master file. The command is then actually run on the region file. See \texttt{TeX-command-region} for details.

It is also possible to compile automatically the whole document until it is ready with a single command: \texttt{TeX-command-run-all}.

\texttt{TeX-command-run-all} \hspace{1cm} \texttt{[Command]}  
\texttt{(C-c C-a)} Compile the current document until an error occurs or it is finished. If compilation finishes successfully, run the viewer at the end.

Here are some relevant variables.

\texttt{TeX-region} \hspace{1cm} \texttt{[User Option]}  
The name of the file for temporarily storing the text when formatting the current region.

\texttt{TeX-header-end} \hspace{1cm} \texttt{[User Option]}  
A regular expression matching the end of the header. By default, this is \texttt{\begin{document}} in \LaTeX{} mode and \texttt{\%**end of header} in plain \TeX{} mode.

\texttt{TeX-trailer-start} \hspace{1cm} \texttt{[User Option]}  
A regular expression matching the start of the trailer. By default, this is \texttt{\end{document}} in \LaTeX{} mode and \texttt{\bye} in plain \TeX{} mode.

If you want to change the values of \texttt{TeX-header-end} and \texttt{TeX-trailer-start} you can do this for all files by setting the variables in a mode hook or per file by specifying them as file variables (see Section “File Variables” in \textit{The Emacs Editor}).

\texttt{TeX-pin-region} \hspace{1cm} \texttt{[Command]}  
\texttt{(C-c C-t C-r)} If you don’t have a mode like Transient Mark mode active, where marks get disabled automatically, the region would need to get properly set before each call to \texttt{TeX-command-region}. If you fix the current region with \texttt{C-c C-t C-r}, then it will get used for more commands even though mark and point may change. An explicitly activated mark, however, will always define a new region when calling \texttt{TeX-command-region}.

If the last process you started was on the region, the commands described in Section 4.3 [Debugging], page 66, and Section 4.5 [Control], page 69, will work on that process, otherwise they will work on the process associated with the current document.

Don't run more than one process at the same time. AUCTeX doesn't support simultaneous typeset including region typeset. Wait for the previous process to finish before you start a new process, in particular when you are editing multiple documents in parallel. This limitation applies for preview by \texttt{preview-latex} as well.
4.1.2 Selecting and Executing a Command

Once you started the command selection with \texttt{C-c C-c}, \texttt{C-c C-r} or \texttt{C-c C-b} you will be prompted for the type of command. \textsc{AUCTeX} will try to guess which command is appropriate in the given situation and propose it as default. Usually this is a processor like ‘\texttt{TeX}’ or ‘\texttt{LaTeX}’ if the document was changed or a viewer if the document was just typeset. Other commands can be selected in the minibuffer with completion support by typing \texttt{TAB}.

The available commands are defined by the variable \texttt{TeX-command-list}. Per default it includes commands for typesetting the document (e.g. ‘\texttt{LaTeX}’), for viewing the output (‘\texttt{View}’), for printing (‘\texttt{Print}’), for generating an index (‘\texttt{Index}’) or for spell checking (‘\texttt{Spell}’) to name but a few. You can also add your own commands by adding entries to \texttt{TeX-command-list}. Refer to its doc string for information about its syntax. You might also want to look at \texttt{TeX-expand-list} to learn about the expanders you can use in \texttt{TeX-command-list}.

Note that the default of the variable occasionally changes. Therefore it is advisable to add to the list rather than overwriting it. You can do this with a call to \texttt{add-to-list} in your init file. For example, if you wanted to add a command for running a program called ‘\texttt{foo}’ on the master or region file, you could do this with the following form.

\begin{verbatim}
(eval-after-load "tex"
 '(add-to-list 'TeX-command-list
   '("Foo" "foo %s" TeX-run-command t t :help "Run foo")
   t))
\end{verbatim}

As mentioned before, AUCTeX will try to guess what command you want to invoke. If you want to use another command than ‘\texttt{TeX}’, ‘\texttt{LaTeX}’ or whatever processor AUCTeX thinks is appropriate for the current mode, set the variable \texttt{TeX-command-default}. You can do this for all files by setting it in a mode hook or per file by specifying it as a file variable (see Section “File Variables” in \textit{The Emacs Editor}).

\textbf{TeX-command-default} \hspace{1cm} [User Option]

The default command to run in this buffer. Must be an entry in \texttt{TeX-command-list}.

In case you use biblatex in a document, when automatic parsing is enabled AUCTeX checks the value of ‘\texttt{backend}’ option given to biblatex at load time to decide whether to use Bib\TeX{} or Biber for bibliography processing. Should AUCTeX fail to detect the right backend, you can use the file local \texttt{LaTeX-biblatex-use-Biber} variable.

\textbf{LaTeX-biblatex-use-Biber} \hspace{1cm} [Variable]

If this boolean variable is set as file local, it tells to AUCTeX whether to use Biber with biblatex. In this case, the autodetection of the biblatex backend will be overridden. You may want to set locally this variable if automatic parsing is not enabled.

After confirming a command to execute, AUCTeX will try to save any buffers related to the document, and check if the document needs to be reformatted. If the variable \texttt{TeX-save-query} is non-nil, AUCTeX will query before saving each file. By default AUCTeX will check emacs buffers associated with files in the current directory, in one of the \texttt{TeX-macro-private} directories, and in the \texttt{TeX-macro-global} directories. You can change this by setting the variable \texttt{TeX-check-path}.
TeX-check-path
[User Option]
Directory path to search for dependencies.
If nil, just check the current file. Used when checking if any files have changed.

When performing spell checking on a document or a region (invoked through AUCTeX’s ‘Spell’ command or \texttt{M-x ispell RET}), you want the spell checking program to skip certain macro arguments and environments, most notably the arguments of referencing macros and the contents of verbatim environments. The skipped parts are controlled by variable \texttt{ispell-tex-skip-alists} provided by \texttt{ispell.el}. AUCTeX has a library which can be added to this variable depending on the value of \texttt{TeX-ispell-extend-skip-list} which is set to \texttt{t} by default.

TeX-ispell-extend-skip-list
[User Option]
This boolean option controls whether AUCTeX activates its extension for skipping certain macro arguments and environments when spell checking.

When non-nil, AUCTeX loads the file \texttt{tex-ispell.el} and adds its content to \texttt{ispell-tex-skip-alists}. This library can and will never be complete, but the interface can be used to add selected and private macro names within your init file or on a file local basis.

\texttt{ispell-tex-skip-alists} has the following structure:

\begin{quote}
(\texttt{defvar ispell-tex-skip-alists}
  '((;; First list
     ("\\\\\\\addcontentsline" \texttt{ispell-tex-arg-end 2})
     ("\\\\\\([aA]\)lph\(\|arabic\)\)" \texttt{ispell-tex-arg-end})
     ("\\\\\makebox" \texttt{ispell-tex-arg-end 0})
     ("\\\documentclass" . "\\\begin\{document\}")
   ) ;; Second list
   ("\\\(figure\|table\)\*\?" \texttt{ispell-tex-arg-end 0})
   ("list" \texttt{ispell-tex-arg-end 2})
   ("verbatim\*\?" . "\\\end\{verbatim\*\?\}")
  )

"Lists of regions to be skipped in TeX mode. First list is used raw. Second list has key placed inside \texttt{\begin{}{}}."
\end{quote}

Each item is an alist and the structure of it is described in \texttt{ispell-skip-region-alist}:

\begin{quote}
(\texttt{defvar ispell-skip-region-alist}
  '((...))

"Alist expressing beginning and end of regions not to spell check. The alist key must be a regular expression. Valid forms include:
  (KEY) - just skip the key.
  (KEY . REGEXP) - skip to the end of REGEXP. REGEXP may be string or symbol.
  (KEY REGEXP) - skip to end of REGEXP. REGEXP must be a string.
  (KEY FUNCTION ARGS) - FUNCTION called with ARGS returns end of region.""
\end{quote}
Let's go through the first list of `ispell-tex-skip-alists` line by line:

```
("\\addcontentsline" ispell-tex-arg-end 2)
```

KEY is the string "\\addcontentsline", FUNCTION is `ispell-tex-arg-end` called with ARGS, here 2. `ispell-tex-arg-end` is a function provided by `ispell.el` which skips as many subsequent optional arguments in square brackets as it sees and then skips ARGS number of mandatory arguments in braces. Omitting ARGS means skip 1 mandatory argument. In practice, when you have something like this in your document:

```
\addcontentsline{toc}{chapter}{Some text}
```

The first two arguments are left out and ‘Some text’ will be spell checked. For the next line

```
("\\([aA]\lph\\|arabic\\)" ispell-tex-arg-end)
```

the name of the counter as argument is skipped. Next line is

```
("\\makebox" ispell-tex-arg-end 0)
```

where only optional arguments are skipped, the first mandatory argument is checked, e.g.

```
\makebox[0pt]{[l]{Some text}}
```

Finally, the next line

```
("\\documentclass" . "\\begin{document}"")
```

ensures that the entire preamble of a document is discarded. Second list works the same; it is more convenient for environments since KEY is wrapped inside \begin{}. AUCTeX provides two functions to add items to car and cdr of `ispell-tex-arg-end`, namely `TeX-ispell-skip-setcar` and `TeX-ispell-skip-setcdr`. The argument of these functions is exactly as in `ispell-tex-skip-alists`. Additions can be done via init file, e.g.:

```
(eval-after-load "tex-ispell"
 'progn
 (TeX-ispell-skip-setcar
 '((("\\mymacro" ispell-tex-arg-end))))
 (TeX-ispell-skip-setcdr
 '((("myverbatim" . "\\end{myverbatim}")))))
```

Another possibility is to use file local additions at the end of your TeX file, e.g.:

```
%%% Local Variables:
%%% mode: latex
%%% TeX-master: t
%%% eval: (TeX-ispell-skip-setcar '((("\\mymacro" . 
"\{-0-9\}+")))))
%%% End:
```

Finally, AUCTeX provides a function called `TeX-ispell-tex-arg-end` which sees more arguments than `ispell-tex-arg-end`. Refer to its doc string for more information.

AUCTeX also provides a facility to skip the argument of in-line verbatim macros like ‘\Verb’ from `fancyverb.sty` or ‘\mintinline’ from `minted.sty`. Characters delimiting the verbatim text are stored in `TeX-ispell-verb-delimiters`. 
TeX-ispell-verb-delimiters

String with delimiters recognized for in-line verbatim macros. This variable is initialized to ‘!|#"*/+^-’. Since this string is used to build a character alternative inside a regular expression, special characters ‘^’ and ‘-’ should come last. Other characters like opening brace ‘{’, asterisk ‘*’ or at sign ‘@’ should be avoided as they are not recognized by font-latex.el.

4.1.3 Options for \TeX\ Processes

There are some options you can customize affecting which processors are invoked or the way this is done and which output they produce as a result. These options control if DVI or PDF output should be produced, if \TeX\ should be started in interactive or nonstop mode, if source specials or a Sync\TeX\ file should be produced for making inverse and forward search possible or which \TeX\ engine should be used instead of regular \TeX, like PDFTeX, Omega or Xe\TeX, and the style error messages are printed with.

TeX-PDF-mode

([Command])

\texttt{(C-c C-t C-p)} This command toggles the PDF mode of AUCTeX, a buffer-local minor mode which is enabled by default. You can customize TeX-PDF-mode to give it a different default or set it as a file local variable on a per-document basis. This option usually results in calling either PDFTeX or ordinary TeX.

TeX-DVI-via-PDFTeX

([User Option])

If this is set, DVI will also be produced by calling PDFTeX, setting \texttt{pdfoutput=0}. This makes it possible to use PDFTeX features like character protrusion even when producing DVI files. Contemporary TeX distributions do this anyway, so that you need not enable the option within AUCTeX.

TeX-interactive-mode

([Command])

\texttt{(C-c C-t C-i)} This command toggles the interactive mode of AUCTeX, a global minor mode. You can customize TeX-interactive-mode to give it a different default. In interactive mode, \TeX\ will pause with an error prompt when errors are encountered and wait for the user to type something.

TeX-source-correlate-mode

([Command])

\texttt{(C-c C-t C-s)} Toggles support for forward and inverse search. Forward search refers to jumping to the place in the previewed document corresponding to where point is located in the document source and inverse search to the other way round. See Section 4.2.2 \texttt{[I/O Correlation]}, page 64.

You can permanently activate TeX-source-correlate-mode by customizing the variable TeX-source-correlate-mode. There is a bunch of customization options for the mode, use \texttt{M-x customize-group RET TeX-view RET} to find out more.

AUCTeX is aware of three different means to do I/O correlation: source specials (only DVI output), the pdfsync \LaTeX\ package (only PDF output) and Sync\TeX. The choice between source specials and Sync\TeX\ can be controlled with the variable TeX-source-correlate-method.

Should you use source specials it has to be stressed very strongly however, that source specials can cause differences in page breaks and spacing, can seriously interfere with
various packages and should thus *never* be used for the final version of a document. In particular, fine-tuning the page breaks should be done with source specials switched off.

Sometimes you are requested, by journal rules or packages, to compile the document into DVI output. Thus, if you want a PDF document in the end you can either use \TeX\textsuperscript{e}X engine, see below for information about how to set engines, or compile the document with \texttt{tex} and then convert to PDF with \texttt{dvips-ps2pdf} before viewing it. In addition, current Japanese \TeX\textsuperscript{e}X engines cannot generate PDF directly so they rely on DVI-to-PDF converters. Usually \texttt{dvipdfmx} command is used for this purpose. You can use the \texttt{TeX-PDF-from-DVI} variable to let AUCTeX know you want to generate the final PDF by converting a DVI file.

**TeX-PDF-from-DVI**  
This option controls if and how to produce a PDF file by converting a DVI file.  
When \texttt{TeX-PDF-mode} is non-nil, if \texttt{TeX-PDF-from-DVI} is non-nil too the document is compiled to DVI instead of PDF. When the document is ready, \texttt{C-c C-c} will suggest to run the converter to PDF or an intermediate format.  
If non-nil, \texttt{TeX-PDF-from-DVI} should be the name of the command in \texttt{TeX-command-list}, as a string, used to convert the DVI file to PDF or to an intermediate format.  
Values currently supported are:  
- "Dvips": the DVI file is converted to PS with \texttt{dvips}. After successfully running it, \texttt{ps2pdf} will be the default command to convert the PS file to PDF.  
- "Dvipdfmx": the DVI file is converted to PDF with \texttt{dvipdfmx}.

(case is significant; note the uppercase ‘D’ in both strings) When the PDF file is finally ready, the next suggested command will be ‘View’ to open the viewer.

This option can also be set as a file local variable, in order to use this conversion on a per-document basis.

Recall the whole sequence of \texttt{C-c C-c} commands can be replaced by the single \texttt{C-a}.

AUCTeX also allows you to easily select different \TeX\textsuperscript{e}X engines for processing, either by using the entries in the ‘\TeX\textsuperscript{e}Xing Options’ submenu below the ‘Command’ menu or by calling the function \texttt{TeX-engine-set}. These eventually set the variable \texttt{TeX-engine} which you can also modify directly.

**TeX-engine**  
This variable allows you to choose which \TeX\textsuperscript{e}X engine should be used for typesetting the document, i.e. the executables which will be used when you invoke the ‘\TeX’ or ‘LaTeX’ commands. The value should be one of the symbols defined in \texttt{TeX-engine-alist-builtin} or \texttt{TeX-engine-alist}. The symbols ‘default’, ‘xetex’, ‘luatex’ and ‘omega’ are available from the built-in list.

Note that \texttt{TeX-engine} is buffer-local, so setting the variable directly or via the above mentioned menu or function will not take effect in other buffers. If you want to activate an engine for all AUCTeX modes, set \texttt{TeX-engine} in your init file, e.g. by using \texttt{M-x customize-option RET}. If you want to activate it for a certain AUCTeX mode only, set
the variable in the respective mode hook. If you want to activate it for certain files, set it through file variables (see Section “File Variables” in *The Emacs Editor*).

Should you need to change the executable names related to the different engine settings, there are some variables you can tweak. Those are `TeX-command`, `LaTeX-command`, `TeX-Omega-command`, `LaTeX-Omega-command`, `ConTeXt-engine` and `ConTeXt-Omega-engine`. The rest of the executables is defined directly in `TeX-engine-alist-builtin`. If you want to override an entry from that, add an entry to `TeX-engine-alist` that starts with the same symbol as that the entry in the built-in list and specify the executables you want to use instead. You can also add entries to `TeX-engine-alist` in order to add support for engines not covered per default.

**TeX-engine-alist**

Alist of TeX engines and associated commands. Each entry is a list with a maximum of five elements. The first element is a symbol used to identify the engine. The second is a string describing the engine. The second is the command to be used for plain TeX. The fourth is the command to be used for LaTeX. The fifth is the command to be used for the `--engine` parameter of ConTeXt’s `texexec` program. Each command can either be a variable or a string. An empty string or `nil` means there is no command available.

In some systems, Emacs cannot inherit the `PATH` environment variable from the shell and thus AUCTEx may not be able to run TeX commands. Before running them, AUCTEx checks if it is able to find those commands and will warn you in case it fails. You can skip this test by changing the option `TeX-check-TeX`.

**TeX-check-TeX**

If non-nil, AUCTEx will check if it is able to find a working TeX distribution before running TeX, LaTeX, ConTeXt, etc. It actually checks if can run `TeX-command` command or the shell returns a command not found error. The error code returned by the shell in this case can be set in `TeX-check-TeX-command-not-found` option.

Some LaTeX packages requires the document to be compiled with a specific engine. Notable examples are ‘fontspec’ and ‘polyglossia’ packages, which require LuaTeX and XeTeX engines. If you try to compile a document which loads one of such packages and the set engine is not one of those allowed you will be asked to select a different engine before running the LaTeX command. If you do not want to be warned by AUCTEx in these cases, customize the option `TeX-check-engine`.

**TeX-check-engine**

This boolean option controls whether AUCTEx should check the correct engine has been set before running LaTeX commands.

As shown above, AUCTEx handles in a special way most of the main options that can be given to the TeX processors. When you need to pass to the TeX processor arbitrary options not handled by AUCTEx, you can use the file local variable `TeX-command-extra-options`.

**TeX-command-extra-options**

String with the extra options to be given to the TeX processor. For example, if you need to enable the shell escape feature to compile a document, add the following line to the list of local variables of the source file:
By default this option is not safe as a file-local variable because a specially crafted document compiled with shell escape enabled can be used for malicious purposes.

You can customize AUCTeX to show the processor output as it is produced.

**TeX-show-compilation**  
If non-nil, the output of \TeX\ compilation is shown in another window.

You can instruct \TeX\ to print error messages in the form ‘file:line:error’ which is similar to the way many compilers format them.

**TeX-file-line-error**  
If non-nil, \TeX\ will produce ‘file:line:error’ style error messages.

Con\TeX\t users can choose between Mark II and Mark IV versions. This is controlled by **ConTeXt-Mark-version** option.

**ConTeXt-Mark-version**  
This variables specifies which version of Mark should be used. Values currently supported are "II", the default, and "IV". It can be set globally using customization interface or on a per-file basis, by specifying it as a file variable.

### 4.2 Viewing the Formatted Output

AUCTeX allows you to start external programs for previewing the formatted output of your document.

#### 4.2.1 Starting Viewers

Viewers are normally invoked by pressing `C-c C-c` once the document is formatted, which will propose the ‘View’ command, or by activating the respective entry in the Command menu. Alternatively you can type `C-c C-v` which calls the function **TeX-view**.

**TeX-view**  
`C-c C-v` Start a viewer without confirmation. The viewer is started either on a region or the master file, depending on the last command issued. This is especially useful for jumping to the location corresponding to point in the viewer when using **TeX-source-correlate-mode**.

AUCTeX will try to guess which type of viewer (DVI, PostScript or PDF) has to be used and what options are to be passed over to it. This decision is based on the output files present in the working directory as well as the class and style options used in the document. For example, if there is a DVI file in your working directory, a DVI viewer will be invoked. In case of a PDF file it will be a PDF viewer. If you specified a special paper format like ‘a5paper’ or use the ‘landscape’ option, this will be passed to the viewer by the appropriate options. Especially some DVI viewers depend on this kind of information in order to display your document correctly. In case you are using ‘\texttt{pstricks}’ or ‘\texttt{psfrag}’ in your document, a DVI viewer cannot display the contents correctly and a PostScript viewer will be invoked instead.
The association between the tests for the conditions mentioned above and the viewers is made in the variable `TeX-view-program-selection`. Therefore this variable is the starting point for customization if you want to use other viewers than the ones suggested by default.

**TeX-view-program-selection**  
*User Option*

This is a list of predicates and viewers which is evaluated from front to back in order to find out which viewer to call under the given conditions. In the first element of each list item you can reference one or more predicates defined in `TeX-view-predicate-list` or `TeX-view-predicate-list-builtin`. In the second element you can reference a viewer defined in `TeX-view-program-list` or `TeX-view-program-list-builtin`. The viewer of the first item with a positively evaluated predicate is selected.

So `TeX-view-program-selection` only contains references to the actual implementations of predicates and viewer commands respectively which can be found elsewhere. AUCTeX comes with a set of preconfigured predicates and viewer commands which are stored in the variables `TeX-view-predicate-list-builtin` and `TeX-view-program-list-builtin` respectively. If you are not satisfied with those and want to overwrite one of them or add your own definitions, you can do so via the variables `TeX-view-predicate-list` and `TeX-view-program-list`.

**TeX-view-predicate-list**  
*User Option*

This is a list of predicates for viewer selection and invocation. The first element of each list item is a symbol and the second element a Lisp form to be evaluated. The form should return `nil` if the predicate is not fulfilled.

A built-in predicate from `TeX-view-predicate-list-builtin` can be overwritten by defining a new predicate with the same symbol.

**TeX-view-program-list**  
*User Option*

This is a list of viewer specifications each consisting of a symbolic name and either a command line or a function to be invoked when the viewer is called. If a command line is used, parts of it can be conditionaled by prefixing them with predicates from `TeX-view-predicate-list` or `TeX-view-predicate-list-builtin`. (See the doc string for the exact format to use.) The command line can also contain placeholders as defined in `TeX-expand-list` and `TeX-expand-list-builtin` which are expanded before the viewer is called.

The third element of each item is a string, or a list of strings, with the name of the executable, or executables, needed to open the output file in the viewer. Placeholders defined in `TeX-expand-list` and `TeX-expand-list-builtin` can be used here. This element is optional and is used to check whether the viewer is actually available on the system.

A built-in viewer spec from `TeX-view-program-list-builtin` can be overwritten by defining a new viewer spec with the same name.

After the viewer is called via either the `View` command or the key stroke `C-c C-v`, the window system focus goes and stays on the viewer. If you prefer that the focus is pulled back to Emacs immediately after that and you are using evince-compatible viewer, customize the option `TeX-view-enince-keep-focus`.
TeX-view-evince-keep-focus [User Option]

When this option is non-nil and the viewer is compatible with evince, the focus is pulled back to Emacs immediately after the viewer is invoked or refreshed from within AUCTeX.

Note that the viewer selection and invocation as described above will only work if certain default settings in AUCTeX are intact. For one, the whole viewer selection machinery will only be triggered if there is no ‘%V’ expander in TeX-expand-list. So if you have trouble with the viewer invocation you might check if there is an older customization of the variable in place. In addition, the use of a function in TeX-view-program-list only works if the ‘View’ command in TeX-command-list makes use of the hook TeX-run-discard-or-function.

4.2.2 Forward and Inverse Search

Forward and inverse search refer to the correlation between the document source in the editor and the typeset document in the viewer. Forward search allows you to jump to the place in the previewed document corresponding to a certain line in the document source and inverse search vice versa.

AUCTeX supports three methods for forward and inverse search: source specials (only DVI output), the pdfsync LaTeX package (only PDF output) and SyncTeX (any type of output). If you want to make use of forward and inverse searching with source specials or SyncTeX, switch on TeX-source-correlate-mode. See Section 4.1.3 [Processor Options], page 59, on how to do that. The use of the pdfsync package is detected automatically if document parsing is enabled. Customize the variable TeX-source-correlate-method to select the method to use.

TeX-source-correlate-method [User Option]

Method to use for enabling forward and inverse search. This can be ‘source-specials’ if source specials should be used, ‘synctex’ if SyncTeX should be used, or ‘auto’ if AUCTeX should decide.

When the variable is set to ‘auto’, AUCTeX will always use SyncTeX if your latex processor supports it, source specials otherwise. You must make sure your viewer supports the same method.

It is also possible to specify a different method depending on the output, either DVI or PDF, by setting the variable to an alist of the kind

```lisp
((dvi . ‘<source-specials or synctex>’)
 (pdf . ‘<source-specials or synctex>’))
```

in which the CDR of each entry is a symbol specifying the method to be used in the corresponding mode. The default value of the variable is

```lisp
((dvi . source-specials)
 (pdf . synctex))
```

which is compatible with the majority of viewers.

Forward search happens automatically upon calling the viewer, e.g. by typing C-c C-v (TeX-view). This will open the viewer or bring it to front and display the output page
corresponding to the position of point in the source file. AUCTeX will automatically pass the necessary command line options to the viewer for this to happen.

You can also make special mouse event do forward search at the clicked position. Use \texttt{TeX-source-correlate-map} and \texttt{TeX-view-mouse} like this:

\begin{verbatim}
(eval-after-load "tex"
  '(define-key TeX-source-correlate-map [C-down-mouse-1]
    #'TeX-view-mouse))
\end{verbatim}

This example binds \texttt{C-down-mouse-1}, which usually opens a concise menu to select buffer, to the command to do forward search.

Upon opening the viewer you will be asked if you want to start a server process (Gnuserv or Emacs server) which is necessary for inverse search. This happens only if there is no server running already. You can customize the variable \texttt{TeX-source-correlate-start-server} to inhibit the question and always or never start the server respectively.

\texttt{TeX-source-correlate-start-server} [User Option]

If \texttt{TeX-source-correlate-mode} is active and a viewer is invoked, the default behavior is to ask if a server process should be started. Set this variable to \texttt{t} if the question should be inhibited and the server should always be started. Set it to \texttt{nil} if the server should never be started. Inverse search will not be available in the latter case.

Inverse search, i.e. jumping to the part of your document source in Emacs corresponding to a certain position in the viewer, is triggered from the viewer, typically by a mouse click. Refer to the documentation of your viewer to find out how it has to be configured and what you have to do exactly. In xdvi you normally have to use \texttt{C-down-mouse-1}.

Note that inverse search with the Evince PDF viewer or its MATE fork Atril might fail in raising the Emacs frame after updating point in your document’s buffer. There is simply no way to raise the Emacs frame reliably across different operating systems and different window managers with their different focus stealing policies. If the Emacs frame is not raised after performing an inverse search from Evince or Atril, you can customize the following option.

\texttt{TeX-raise-frame-function} [User Option]

A function that will be called after performing an inverse search from Evince or Atril in order to raise the current Emacs frame.

If your Emacs frame is already raised in that situation, just leave this variable set to its default value \texttt{raise-frame}. Otherwise, here are some alternative settings that work for some users.

\begin{verbatim}
;; Alternative 1: For some users, `x-focus-frame' works.
(setq TeX-raise-frame-function #'x-focus-frame)

;; Alternative 2: Under GNOME 3.20 (and probably others), it
;; seems some focus stealing prevention policy prohibits that
;; some window gets the focus immediately after the user has
\end{verbatim}

\footnote{The keymap name is \texttt{TeX-source-correlate-map}, not \texttt{TeX-source-correlate-mode-map}. Actually, this keymap isn’t implemented as minor mode map of \texttt{TeX-source-correlate-mode}, in order that its bindings don’t affect buffers outside of AUCTeX.}
4.3 Catching the errors

Once you’ve formatted your document you may ‘debug’ it, i.e. browse through the errors (La)TeX reported. You may also have a look at a nicely formatted list of all errors and warnings reported by the compiler.

\textbf{TeX-next-error arg reparse} \hfill [Command]
\hfill (C-c ‘) Go to the next error reported by \LaTeX. The view will be split in two, with the cursor placed as close as possible to the error in the top view. In the bottom view, the error message will be displayed along with some explanatory text.

An optional numeric \texttt{arg}, positive or negative, specifies how many error messages to move. A negative \texttt{arg} means to move back to previous error messages, see also \texttt{TeX-previous-error}.

The optional \texttt{reparse} argument makes \texttt{AUCTeX} reparse the error message buffer and start the debugging from the first error. This can also be achieved by calling the function with a prefix argument (C-u).

\textbf{TeX-previous-error arg} \hfill [Command]
\hfill (M-g p) Go to the previous error reported by \LaTeX. An optional numeric \texttt{arg} specifies how many error messages to move backward. This is like calling \texttt{TeX-next-error} with a negative argument.

The command \texttt{TeX-previous-error} works only if \texttt{AUCTeX} can parse the whole \LaTeX\ log buffer. This is controlled by the \texttt{TeX-parse-all-errors} variable.

\textbf{TeX-parse-all-errors} \hfill [User Option]
If \texttt{t}, \texttt{AUCTeX} automatically parses the whole output log buffer right after running a \LaTeX\ command, in order to collect all warnings and errors. This makes it possible to navigate back and forth between the error messages using \texttt{TeX-next-error} and \texttt{TeX-previous-error}. This is the default. If \texttt{nil}, \texttt{AUCTeX} does not parse the whole output log buffer and \texttt{TeX-previous-error} cannot be used.

As default, \texttt{AUCTeX} will display a special help buffer containing the error reported by \LaTeX\ along with the documentation. There is however an ‘expert’ option, which allows you to display the real \LaTeX\ output.
TeX-display-help [User Option]
If t, AUCTeX will automatically display a help text whenever an error is encountered using \texttt{TeX-next-error} (C-c '). If \texttt{nil}, a terse information about the error is displayed in the echo area. If \texttt{expert} AUCTeX will display the output buffer with the raw \TeX output.

4.3.1 Controlling warnings to be reported
Normally AUCTeX will only report real errors, but you may as well ask it to report ‘bad boxes’ and warnings as well.

\texttt{TeX-toggle-debug-bad-boxes} [Command]
(C-c C-t C-b) Toggle whether AUCTeX should stop at bad boxes (i.e. overfull and underfull boxes) as well as normal errors. The boolean option \texttt{TeX-debug-bad-boxes} is set accordingly.

\texttt{TeX-toggle-debug-warnings} [Command]
(C-c C-t C-w) Toggle whether AUCTeX should stop at warnings as well as normal errors. The boolean option \texttt{TeX-debug-warnings} is set accordingly.

While many users desire to have warnings reported after compilation, there are certain warnings that are considered unimportant and users want to ignore them. For a more fine-grained control of what kinds of warnings should be shown after compilation, AUCTeX provides other options.

\texttt{TeX-ignore-warnings} [User Option]
Controls which warnings are to be ignored.
It can be a regexp matching the message of the warnings to be ignored.
More advanced users can set also this option to a symbol with the name of a custom function taking as arguments all the information of the warning listed in \texttt{TeX-error-list} variable, except the last one about whether to ignore the warning. See the code of \texttt{TeX-warning} function and the documentation of \texttt{TeX-error-list} for more details.

\texttt{TeX-toggle-suppress-ignored-warnings} [Command]
(C-c C-t C-x) Toggle whether AUCTeX should actually hide the ignored warnings specified with \texttt{TeX-ignore-warnings}. The boolean option \texttt{TeX-suppress-ignored-warnings} is set accordingly. If this is \texttt{nil}, all warnings are shown, even those matched by \texttt{TeX-ignore-warnings}, otherwise these are hidden.
Note that \texttt{TeX-debug-warnings} takes the precedence: if it is \texttt{nil}, all warnings are hidden in any case.

4.3.2 List of all errors and warnings
When the option \texttt{TeX-parse-all-errors} is non-\texttt{nil}, you will be also able to open an overview of all errors and warnings reported by the \TeX compiler.

\texttt{TeX-error-overview} [Command]
Show an overview of the errors and warnings occurred in the last \TeX run.
In this window you can visit the error on which point is by pressing RET, and visit the next or previous issue by pressing n or p respectively. A prefix argument to these
keys specifies how many errors to move forward or backward. You can visit an error also by clicking on its message. Jump to error point in the source code with j, and use l see the error in the log buffer. In addition, you can toggle visibility of bad boxes, generic warnings, and ignored warnings with b, w, and x, respectively (see Section 4.3.1 [Ignoring warnings], page 67, for details). Press q to quit the overview.

**TeX-error-overview-open-after-TeX-run** [User Option]
When this boolean variable is non-nil, the error overview will be automatically opened after running TeX if there are errors or warnings to show.

The error overview is opened in a new window of the current frame by default, but you can change this behavior by customizing the option TeX-error-overview-setup.

**TeX-error-overview-setup** [User Option]
Controls the frame setup of the error overview. The possible value is: separate-frame; with a nil value the current frame is used instead.

The parameters of the separate frame can be set with the TeX-error-overview-frame-parameters option.

If the display does not support multi frame, the current frame will be used regardless of the value of this variable.

### 4.4 Checking for problems

Running TeX or LaTeX will only find regular errors in the document, not examples of bad style. Furthermore, description of the errors may often be confusing. The utilities lacheck and chktex can be used to find style errors, such as forgetting to escape the space after an abbreviation or using ‘...’ instead of ‘\ldots’ and other similar problems. You start lacheck with C-c C-c Check RET and chktex with C-c C-c ChkTeX RET. The result will be a list of errors in the ‘*compilation*’ buffer. You can go through the errors with C-x ‘(next-error, see Section “Compilation” in The Emacs Editor), which will move point to the location of the next error.

Alternatively, you may want in-buffer notation. AUCTeX provides support for this using the Flymake package in Emacs 26 or newer (see Section “Using Flymake” in GNU Flymake for details). To enable, call M-x flymake-mode RET in the buffer or enable it in all buffers by adding this to your init file:

```lisp
(add-hook 'LaTeX-mode-hook #'flymake-mode)
```

Note that AUCTeX currently only provides support for using chktex as the flymake backend.

Each of the two utilities lacheck and chktex will find some errors the other doesn’t, but chktex is more configurable, allowing you to create your own errors. You may need to install the programs before using them. You can get lacheck from URL: https://www.ctan.org/pkg/lacheck and chktex from URL: https://www.ctan.org/pkg/chktex. TeX Live contains both.
4.5 Controlling the output

A number of commands are available for controlling the output of an application running under AUCTeX

**TeX-kill-job**

(\texttt{C-c C-k}) Kill currently running external application. This may be either of \TeX, \LaTeX, previewer, Bib\TeX, etc.

**TeX-recenter-output-buffer**

(\texttt{C-c C-l}) Recenter the output buffer so that the bottom line is visible.

**TeX-home-buffer**

(\texttt{C-c C-\textasciicircum}) Go to the ‘master’ file in the document associated with the current buffer, or if already there, to the file where the current process was started.

Additionally, output files produced by AUCTeX can be placed in a separate directory.

**TeX-output-dir**

Set this option to the path of a directory where output files will be placed. The output files include those that are produced by applications running under AUCTeX, temporary files related to region processing and the \texttt{preview-latex} files. If a relative path is specified, it is interpreted as being relative to the master file in a multifile document.

This is a buffer local variable and must be set separately for all documents and all files in a multifile document. For example,

```latex
%%% Local Variables:
%%% mode: latex
%%% TeX-output-dir: "build"
%%% End:
```

Alternatively, you may use \texttt{setq-default} to set the default value of this option or set it as a directory local variable (see Section “Directory Variables” in *The Emacs Editor*).

Note that a non-nil value of \texttt{TeX-output-dir} might be incompatible with some \TeX commands and macros. In particular, the \LaTeX macro \texttt{'\include} is known to not work with this option. Some \TeX packages which produce intermediary files might also be incompatible. A possible workaround for those packages is to append the value of \texttt{TeX-output-dir} to the environment variables \texttt{TEXINPUTS} and \texttt{BIBINPUTS}.

4.6 Cleaning intermediate and output files

**TeX-clean**

Remove generated intermediate files. In case a prefix argument is given, remove output files as well.

Canonical access to the function is provided by the ‘\texttt{Clean}’ and ‘\texttt{Clean All}’ entries in \texttt{TeX-command-list}, invokable with \texttt{C-c C-c} or the Command menu.

The patterns governing which files to remove can be adapted separately for each AUCTeX mode by means of the following variables:

- \texttt{plain-TeX-clean-intermediate-suffixes}
• \texttt{plain-TeX-clean-output-suffixes}
• \texttt{LaTeX-clean-intermediate-suffixes}
• \texttt{LaTeX-clean-output-suffixes}
• \texttt{docTeX-clean-intermediate-suffixes}
• \texttt{docTeX-clean-output-suffixes}
• \texttt{Texinfo-clean-intermediate-suffixes}
• \texttt{Texinfo-clean-output-suffixes}
• \texttt{ConTeXt-clean-intermediate-suffixes}
• \texttt{ConTeXt-clean-output-suffixes}
• \texttt{AmSTeX-clean-intermediate-suffixes}
• \texttt{AmSTeX-clean-output-suffixes}

\texttt{TeX-clean-confirm} \quad \text{[User Option]}

Control if deletion of intermediate and output files has to be confirmed before it is actually done. If non-\texttt{nil}, ask before deleting files.

### 4.7 Documentation about macros and packages

\texttt{TeX-documentation-texdoc} \quad \text{[Command]}

\texttt{(C-c ?)} Get documentation about the packages installed on your system, using \texttt{texdoc} to find the manuals. The function will prompt for the name of packages. If point is on a word, this will be suggested as default.

If the command is called with a prefix argument, you will be shown a list of manuals of the given package among to choose.

The command can be invoked by the key binding mentioned above as well as the ‘Find Documentation...’ entry in the mode menu.

Note that this command assumes \TeX\ Live (\url{https://tug.org/texlive/}), not MiK\TeX\ (\url{https://miktex.org/}); according to ‘\TeXdoc’ site (\url{https://tug.org/texdoc/}),

A command named \texttt{texdoc} is also available in MiK\TeX, but it is merely a shortcut for an independent program, \texttt{mthelp}.

Thus it isn’t sure whether this command works for MiK\TeX or not.
5 Customization and Extension

5.1 Modes and Hooks

AUCTeX supports a wide variety of derivatives and extensions of TeX. Besides plain TeX, those are LaTeX, AMS-TeX, ConTeXt, Texinfo and docTeX. For each of them there is a separate major mode in AUCTeX and each major mode runs text-mode-hook, TeX-mode-hook as well as a hook special to the mode in this order. (As an exception, Texinfo mode does not run TeX-mode-hook.) The following table provides an overview of the respective mode functions and hooks.

<table>
<thead>
<tr>
<th>Type</th>
<th>Mode function</th>
<th>Hook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain TeX</td>
<td>plain-tex-mode</td>
<td>plain-TeX-mode-hook</td>
</tr>
<tr>
<td>LaTeX</td>
<td>latex-mode</td>
<td>LaTeX-mode-hook</td>
</tr>
<tr>
<td>AMS-TeX</td>
<td>ams-tex-mode</td>
<td>AmS-TeX-mode-hook</td>
</tr>
<tr>
<td>ConTeXt</td>
<td>context-mode</td>
<td>ConTeXt-mode-hook</td>
</tr>
<tr>
<td>Texinfo</td>
<td>texinfo-mode</td>
<td>Texinfo-mode-hook</td>
</tr>
<tr>
<td>DocTeX</td>
<td>doctex-mode</td>
<td>docTeX-mode-hook</td>
</tr>
</tbody>
</table>

If you need to make a customization via a hook which is only relevant for one of the modes listed above, put it into the respective mode hook, if it is relevant for any AUCTeX mode, add it to TeX-mode-hook and if it is relevant for all text modes, append it to text-mode-hook.

Other useful hooks are listed below.

TeX-after-compilation-finished-functions [Variable]

Hook which is run after the TeX/IMTeX processor has successfully finished compiling your document. (See Chapter 4 [Processing], page 54, for finding out how to compile your document.) Each function in the hook is run with the compiled output document as its argument.

This is useful for automatically refreshing the viewer after re-compilation especially when using Emacs viewers such as DocView or PDF Tools. The function TeX-revert-document-buffer can be added to the hook for this purpose.

5.2 Multifile Documents

You may wish to spread a document over many files (as you are likely to do if there are multiple authors, or if you have not yet discovered the power of the outline commands (see Section 3.3 [Outline], page 52)). This can be done by having a “master” file in which you include the various files with the TeX macro ‘\input’ or the IMTeX macro ‘\include’. These files may also include other files themselves. However, to format the document you must run the commands on the top level master file.

When you, for example, ask AUCTeX to run a command on the master file, it has no way of knowing the name of the master file. By default, it will assume that the current file is the master file. If you insert the following in your init file (init.el or .emacs), AUCTeX will use a more advanced algorithm.

(setq-default TeX-master nil) ; Query for master file.
In this case, AUCTeX will ask for the name of the master file associated with the buffer. To avoid asking you again, AUCTeX will automatically insert the name of the master file as a file variable (see Section “File Variables” in The Emacs Editor). You can also insert the file variable yourself, by putting the following text at the end of your files.

```plaintext
%%% Local Variables:
%%% TeX-master: "master"
%%% End:
```

You should always set this variable to the name of the top level document. If you always use the same name for your top level documents, you can set TeX-master in your init file such as init.el or .emacs.

```lisp
(setq-default TeX-master "master") ; All master files called "master".
```

**TeX-master**

[User Option]

The master file associated with the current buffer. If the file being edited is actually included from another file, then you can tell AUCTeX the name of the master file by setting this variable. If there are multiple levels of nesting, specify the top level file.

- If this variable is nil, AUCTeX will query you for the name.
- If the variable is t, then AUCTeX will assume the file is a master file itself.
- If the variable is shared, then AUCTeX will query for the name, but will not change the file.
- If the variable is dwim, AUCTeX will try to avoid querying by attempting to “do what I mean”; and then change the file.

**TeX-one-master**

[User Option]

Regular expression matching ordinary TeX files.

You should set this variable to match the name of all files, for which it is a good idea to append a TeX-master file variable entry automatically. When AUCTeX adds the name of the master file as a file variable, it does not need to ask next time you edit the file.

If you dislike AUCTeX automatically modifying your files, you can set this variable to "<none>". By default, AUCTeX will modify any file with an extension of '.tex', '.texi' or '.dtx'.

**TeX-master-file-ask**

[Command]

(C-c _) Query for the name of a master file and add the respective File Variables (see Section “File Variables” in The Emacs Editor) to the file for setting this variable permanently.

AUCTeX will not ask for a master file when it encounters existing files. This function shall give you the possibility to insert the variable manually.

AUCTeX keeps track of macros, environments, labels, and style files that are used in a given document. For this to work with multifile documents, AUCTeX has to have a place to put the information about the files in the document. This is done by having an auto subdirectory placed in the directory where your document is located. Each time you save a file, AUCTeX will write information about the file into the auto directory. When you load a file, AUCTeX will read the information in the auto directory about the file you loaded and
the master file specified by TeX-master. Since the master file (perhaps indirectly) includes all other files in the document, AUCTeX will get information from all files in the document. This means that you will get from each file, for example, completion for all labels defined anywhere in the document.

AUCTeX will create the auto directory automatically if TeX-auto-save is non-nil. Without it, the files in the document will not know anything about each other, except for the name of the master file. See Section 5.5.3 [Automatic Local], page 82.

TeX-save-document [Command]
(C-c C-d) Save all buffers known to belong to the current document.

TeX-save-query [User Option]
If non-nil, then query the user before saving each file with TeX-save-document.

5.3 Automatic Parsing of TeX Files

AUCTeX depends heavily on being able to extract information from the buffers by parsing them. Since parsing the buffer can be somewhat slow, the parsing is initially disabled. You are encouraged to enable them by adding the following lines to your init file such as init.el or .emacs.

(setq TeX-parse-self t) ; Enable parse on load.
(setq TeX-auto-save t) ; Enable parse on save.

The latter command will make AUCTeX store the parsed information in an auto sub-directory in the directory each time the TeX files are stored, see Section 5.5.3 [Automatic Local], page 82. If AUCTeX finds the pre-parsed information when loading a file, it will not need to reparse the buffer. The information in the auto directory is also useful for multifile documents, see Section 5.2 [Multifile], page 71, since it allows each file to access the parsed information from all the other files in the document. This is done by first reading the information from the master file, and then recursively the information from each file stored in the master file.

The variables can also be set on a per file basis, by changing the file local variables.

%%% Local Variables:
%%% TeX-parse-self: t
%%% TeX-auto-save: t
%%% End:

Even when you have disabled the automatic parsing, you can force the generation of style information by pressing C-c C-n. This is often the best choice, as you will be able to decide when it is necessary to reparse the file.

TeX-parse-self [User Option]
Parse file after loading it if no style hook is found for it.

TeX-auto-save [User Option]
Automatically save style information when saving the buffer.

TeX-normal-mode arg [Command]
(C-c C-n) Remove all information about this buffer, and apply the style hooks again. Save buffer first including style information. With optional argument, also reload the style hooks.
When AUCTeX saves your buffer, it can optionally convert all tabs in your buffer into spaces. Tabs confuse AUCTeX’s error message parsing and so should generally be avoided. However, tabs are significant in some environments, and so by default AUCTeX does not remove them. To convert tabs to spaces when saving a buffer, insert the following in your init file such as `init.el` or `.emacs`:

```lisp
(setq TeX-auto-untabify t)
```

### TeX-auto-untabify
Automatically remove all tabs from a file before saving it.

Instead of disabling the parsing entirely, you can also speed it significantly up by limiting the information it will search for (and store) when parsing the buffer. You can do this by setting the default values for the buffer local variables `TeX-auto-regexp-list` and `TeX-auto-parse-length` in your init file such as `init.el` or `.emacs`.

```lisp
;;; Only parse LaTeX class and package information.
(setq-default TeX-auto-regexp-list 'LaTeX-auto-minimal-regexp-list)
;;; The class and package information is usually near the beginning.
(setq-default TeX-auto-parse-length 2000)
```

This example will speed the parsing up significantly, but AUCTeX will no longer be able to provide completion for labels, macros, environments, or bibitems specified in the document, nor will it know what files belong to the document.

These variables can also be specified on a per file basis, by changing the file local variables.

```lisp
%%% Local Variables:
%%% TeX-auto-regexp-list: TeX-auto-full-regexp-list
%%% TeX-auto-parse-length: 999999
%%% End:
```

### TeX-auto-regexp-list
List of regular expressions used for parsing the current file.

### TeX-auto-parse-length
Maximal length of TeX file that will be parsed.

The pre-specified lists of regexps are defined below. You can use these before loading AUCTeX by quoting them, as in the example above.

### TeX-auto-empty-regexp-list
Parse nothing

### LaTeX-auto-minimal-regexp-list
Only parse LaTeX class and packages.

### LaTeX-auto-label-regexp-list
Only parse LaTeX labels.

### LaTeX-auto-index-regexp-list
Only parse LaTeX index and glossary entries.

### LaTeX-auto-class-regexp-list
Only parse macros in LaTeX classes and packages.
LaTeX-auto-pagestyle-regexp-list
Only parse LaTeX pagestyles.

LaTeX-auto-counter-regexp-list
Only parse LaTeX counters.

LaTeX-auto-length-regexp-list
Only parse LaTeX lengths.

LaTeX-auto-savebox-regexp-list
Only parse LaTeX saveboxes.

LaTeX-auto-regexp-list
Parse common LaTeX commands.

plain-TeX-auto-regexp-list
Parse common plain TeX commands.

TeX-auto-full-regexp-list
Parse all TeX and LaTeX commands that AUCTeX can use.

5.4 Language Support

TeX and Emacs are usable for European (Latin, Cyrillic, Greek) based languages. Some LaTeX and Emacs Lisp packages are available for easy typesetting and editing documents in European languages.

All Emacs versions supported by current AUCTeX can handle CJK (Chinese, Japanese, and Korean) languages by default.

In most cases, special versions of TeX engines are needed for high-quality typesetting of CJK languages: CTeX and ChinaTeX for Chinese, ASCII pTeX, upTeX and NTT jTeX for Japanese, HLaTeX and kTeX for Korean. They are necessary as well when you want to typeset documents saved in their domestic encodings such as ‘Shift-JIS’. Currently, AUCTeX offers native support for pTeX, upTeX and jTeX only.

If you don’t need fine tuning in the result with respect to the typesetting rules of their respective national standards, most unicode based TeX engines, e.g. LuaTeX and XeTeX, can handle CJK languages by default if they are encoded in UTF-8. The CJK-LaTeX package is provided for supporting CJK scripts in a standard LaTeX document.

5.4.1 Using AUCTeX with European Languages

5.4.1.1 Typing and Displaying Non-ASCII Characters

First you will need a way to write non-ASCII characters. You can either use macros, or teach TeX about the ISO character sets. I prefer the latter, it has the advantage that the usual standard emacs word movement and case change commands will work.

Recommended encoding for LaTeX document is UTF-8. Recent LaTeX2e has native support for UTF-8. If your LaTeX2e is not recent enough, just add ‘\usepackage[utf8]{inputenc}’.

You can still use ISO 8859 Latin 1 encoding with ‘\usepackage[latin1]{inputenc}’. 
To be able to display non-ASCII characters you will need an appropriate font. All Emacs versions supported by current AUCTeX can display 8-bit characters, provided that suitable fonts are installed.

A compromise is to use an European character set when editing the file, and convert to TeX macros when reading and writing the files.

iso-cvt.el

Much like iso-tex.el but is bundled with Emacs 19.23 and later.

X-Symbol

a much more complete package for Emacs that can also handle a lot of mathematical characters and input methods.

5.4.1.2 Style Files for Different Languages

AUCTeX supports style files for several languages. Each style file may modify AUCTeX to better support the language, and will run a language specific hook that will allow you to for example change ispell dictionary, or run code to change the keyboard remapping. The following will for example choose a Danish dictionary for documents including ‘\usepackage[ danish]{ babel}’. This requires parsing to be enabled, see Section 5.3 [Parsing Files], page 73.

(add-hook ‘TeX-language-dk-hook
  (lambda () (ispell-change-dictionary "danish")))

The following style files are recognized:

brazilian
brazil

Runs style hook TeX-language-pt-br-hook. Gives ‘”’ word syntax, makes the " key inserts ‘”’ or ‘‘‘’ depending on context. Typing " twice will insert a literal ‘”’. Typing – twice will insert ‘”=’, three times ‘---’.

bulgarian

Runs style hook TeX-language-bg-hook. Gives ‘”’ word syntax, makes the " key insert a literal ‘”’. Typing " twice will insert ‘”’ or ‘‘‘’ depending on context. Typing – twice will insert ‘”=’, three times ‘---’.

czech

Runs style hook TeX-language-cz-hook. Pressing " will insert ‘\uv{’ and ‘\}’ depending on context.

danish

Runs style hook TeX-language-dk-hook. Pressing " will insert ‘”’ and ‘‘‘’ depending on context. Typing – twice will insert ‘”=’, i.e. a hyphen string allowing hyphenation in the composing words.

dutch

Runs style hook TeX-language-nl-hook.

english
australian
canadian
newzealand

Runs style hook TeX-language-en-hook.

frenchb
francais

Runs style hook TeX-language-fr-hook. Pressing " will insert ‘\og’ and ‘\fg’ depending on context. Note that the language name for customizing TeX-quote-language-alist is ‘french’.
german

Runs style hook `TeX-language-de-hook`. Gives "n" word syntax, makes the " key insert a literal "n". Pressing the key twice will give you opening or closing German quotes ("n" or "n'1"). Typing - twice will insert "n'="; three times '--'.

icelandic

Runs style hook `TeX-language-is-hook`. Gives "n" word syntax, makes the " key insert a literal "n". Typing " twice will insert "n'1" or "n'1" depending on context. Typing - twice will insert "n'="; three times '--'.

italian

Runs style hook `TeX-language-it-hook`. Pressing " will insert "<" and ">" depending on context.

polish

Runs style hook `TeX-language-pl-hook`. Gives "n" word syntax and makes the " key insert a literal "n". Pressing " twice will insert "n'1" or "n'1" depending on context.

polski

Runs style hook `TeX-language-pl-hook`. Makes the " key insert a literal "n". Pressing " twice will insert "," or ",", depending on context.

portuguese

Runs style hook `TeX-language-pt-hook`. Gives "n" word syntax, makes the " key inserts "<" or ">" depending on context. Typing " twice will insert a literal '"'. Typing " twice will insert '"', three times '--'. Note that the language name for customizing `TeX-quote-language-alist` is 'portuguese'.

slovak

Runs style hook `TeX-language-sk-hook`. Pressing " will insert \uv{' and '} depending on context.

swedish

Runs style hook `TeX-language-sv-hook`. Pressing " will insert '"'. Typing - twice will insert '"=', three times '--'.

Replacement of language-specific hyphen strings like '"=' with dashes does not require to type - three times in a row. You can put point after the hyphen string anytime and trigger the replacement by typing -.

In case you are not satisfied with the suggested behavior of quote and hyphen insertion you can change it by customizing the variables `TeX-quote-language-alist` and `LaTeX-babel-hyphen-language-alist` respectively.

**TeX-quote-language-alist**

[User Option]

Used for overriding the default language-specific quote insertion behavior. This is an alist where each element is a list consisting of four items. The first item is the name of the language in concern as a string. See the list of supported languages above. The second item is the opening quotation mark. The third item is the closing quotation mark. Opening and closing quotation marks can be specified directly as strings or as functions returning a string. The fourth item is a boolean controlling quote insertion. It should be non-nil if if the special quotes should only be used after inserting a literal "n" character first, i.e. on second key press.

**LaTeX-babel-hyphen-language-alist**

[User Option]

Used for overriding the behavior of hyphen insertion for specific languages. Every element in this alist is a list of three items. The first item should specify the affected
language as a string. The second item denotes the hyphen string to be used as a string. The third item, a boolean, controls the behavior of hyphen insertion and should be non-nil if the special hyphen should be inserted after inserting a literal ‘-’ character, i.e. on second key press.

The defaults of hyphen insertion are defined by the variables \texttt{LaTeX-babel-hyphen} and \texttt{LaTeX-babel-hyphen-after-hyphen} respectively.

\textbf{LaTeX-babel-hyphen} \hspace{1cm} \textbf{[User Option]}

String to be used when typing ‘-’. This usually is a hyphen alternative or hyphenation aid provided by ‘babel’ and the related language style files, like ‘=’, ‘~’ or ‘-’.

Set it to an empty string or \texttt{nil} in order to disable language-specific hyphen insertion.

\textbf{LaTeX-babel-hyphen-after-hyphen} \hspace{1cm} \textbf{[User Option]}

Control insertion of hyphen strings. If non-nil insert normal hyphen on first key press and swap it with the language-specific hyphen string specified in the variable \texttt{LaTeX-babel-hyphen} on second key press. If \texttt{nil} do it the other way round.

\subsection*{5.4.2 Using AUCTeX with Japanese \TeX}

To write Japanese text with AUCTeX, you need the versions of TeX and Emacs that support Japanese. AUCTeX supports three Japanese \TeX engines by default: NTT j\TeX, ASCII p\TeX and up\TeX.

Activate \texttt{japanese-plain-tex-mode} or \texttt{japanese-latex-mode} to use the Japanese \TeX engines. If it doesn’t work, send mail to Masayuki Ataka masayuki.ataka@gmail.com or Ikumi Keita ikumikeita@jcom.home.ne.jp, who currently concern with stuff related to Japanese in AUCTeX. None of the primary AUCTeX maintainers understand Japanese, so they cannot help you.

It is recommended to enable \texttt{TeX-parse-self} for typical Japanese \LaTeX users. When enabled, \texttt{japanese-latex-mode} selects the suitable Japanese \TeX engine automatically based on the class file name (such as \texttt{jbook}, \texttt{jsarticle} and \texttt{tjreport}) and its option. See Section 5.3 [Parsing Files], page 73.

It is important to select the suitable Japanese \TeX engine because the selected engine determines the command name such as \texttt{platex} and \texttt{uptex} to typeset the document. If you find that wrong command is used, check the value of \texttt{TeX-engine} on that buffer. If the value does not suit the current document, change the value by the ‘\TeXing Options’ submenu below the ‘Command’ menu. See Section 4.1.3 [Processor Options], page 59.

To make the selected engine to persist across Emacs sessions, there are two ways from which you can choose one according to your needs:

1. If you use a specific engine (almost) exclusively, customize the option \texttt{japanese-TeX-engine-default}.

   \texttt{japanese-TeX-engine-default} \hspace{1cm} \textbf{[User Option]}

   The default \texttt{TeX-engine} in Japanese \TeX mode.

   The default value is ‘ptex’.

2. If you want to set the engine on a per file basis, use the file local variables to set \texttt{TeX-engine}.
Here is a sample code to set \TeX-engine to ‘uptex’:

\%
\%
Local Variables:
\%
mode: japanese-latex
\%
TeX-engine: uptex
\%
End:

In the both cases above, the valid value is one of ‘ptex’, ‘jtex’ and ‘uptex’.

You can override the command names associated with the above three engines or define your own engine by customizing \TeX-engine-alist. See Section 4.1.3 [Processor Options], page 59.

It is sometimes necessary to use an engine which differs from the one AUCTeX selects automatically. For example, even when you want to use j-article document class deliberately with ASCII \LaTeX, AUCTeX selects NTT jLaTeX command if \TeX-parse-self is enabled, because j-article originally belongs to NTT jLaTeX. In such cases, use the file local variable method above to select the engine you intend to use.

If you usually use AUCTeX in Japanese, setting the following variables is useful.

\TeX-default-mode \[User Option\]
Mode to enter for a new file when it cannot be determined whether the file is plain \TeX{} or \LaTeX{} or what.
If you want to enter Japanese \LaTeX{} mode whenever this may happen, set the variable like this:

(setq TeX-default-mode 'japanese-latex-mode)

\japanese-LaTeX-default-style \[User Option\]
The default style/class when creating a new Japanese \LaTeX{} document.
The default value is ‘"jarticle"’.

It is recommended also for Japanese users to customize the option \TeX-PDF-from-DVI to ‘"Dvipdfmx"’. See Section 4.1.3 [Processor Options], page 59.

There are three customize options with regard to the encoding of Japanese text.

\japanese-TeX-use-kanji-opt-flag \[User Option\]
If non-nil, AUCTeX adds \textit{-kanji} option to the typesetting command when \TeX-engine is ‘ptex’.

Usually AUCTeX guesses the right coding systems for input to and output from the Japanese \TeX{} process, but you can override them by the following two customize options.

\TeX-japanese-process-input-coding-system \[User Option\]
If non-nil, used for encoding input to Japanese \TeX{} process. When nil, AUCTeX tries to choose suitable coding system.

\TeX-japanese-process-output-coding-system \[User Option\]
If non-nil, used for decoding output from Japanese \TeX{} process. When nil, AUCTeX tries to choose suitable coding system.
The former customize options `japanese-TeX-command-default`, `japanese-LaTeX-command-default` and `japanese-TeX-command-list` are removed from AUCTeX. Use `japanese-TeX-engine-default` instead. If you need to customize the executable file name such as `"latex"`, the options for them, or both, customize `TeX-engine-alist`.

The following two additional font commands are available in \LaTeX{} mode buffer.

\begin{itemize}
  \item \texttt{C-c C-f g} Insert \texttt{gothic font} command `\texttt{\textasciitilde \textgt{\star}}` or `\texttt{\mathit{\textasciitilde \mathgt{\star}}}` depending on the context.
  \item \texttt{C-c C-f m} Insert \texttt{mincho font} command `\texttt{\textasciitilde \textmc{\star}}` or `\texttt{\mathit{\textasciitilde \mathmc{\star}}}` depending on the context.
\end{itemize}

Although they are meaningful only with `\ptex` and `\uptex` engines, it won’t matter in buffers with other engines.

See \texttt{tex-jp.el} for more information.

### 5.5 Automatic Customization

Since AUCTeX is so highly customizable, it makes sense that it is able to customize itself. The automatic customization consists of scanning \TeX{} files and extracting symbols, environments, and things like that.

The automatic customization is done on three different levels. The global level is the level shared by all users at your site, and consists of scanning the standard \TeX{} style files, and any extra styles added locally for all users on the site. The private level deals with those style files you have written for your own use, and use in different documents. You may have a `~/lib/\TeX/` directory where you store useful style files for your own use. The local level is for a specific directory, and deals with writing customization for the files for your normal \TeX{} documents.

If compared with the environment variable \texttt{TEXINPUTS}, the global level corresponds to the directories built into \TeX{}. The private level corresponds to the directories you add yourself, except for `.`, which is the local level.

By default AUCTeX will search for customization files in all the global, private, and local style directories, but you can also set the path directly. This is useful if you for example want to add another person’s style hooks to your path. Please note that all matching files found in \texttt{TeX-style-path} are loaded, and all hooks defined in the files will be executed.

\begin{itemize}
  \item \texttt{TeX-style-path} \hfill [User Option]
    List of directories to search for AUCTeX style files.
  \item \texttt{TeX-file-recurse} \hfill [User Option]
    Whether to search \TeX{} directories recursively: \texttt{nil} means do not recurse, a positive integer means go that far deep in the directory hierarchy, \texttt{t} means recurse indefinitely.
\end{itemize}

By default, AUCTeX will ignore files named `.`, `.`, \texttt{SCCS}, \texttt{RCS}, and \texttt{CVS}. 
Chapter 5: Customization and Extension

TeX-ignore-file
[User Option]
Regular expression matching file names to ignore.
These files or directories will not be considered when searching for \TeX \ files in a directory.

5.5.1 Automatic Customization for the Site
Assuming that the automatic customization at the global level was done when \texttt{AUCTeX} was installed, your choice is now: will you use it? If you use it, you will benefit by having access to all the symbols and environments available for completion purposes. The drawback is slower load time when you edit a new file and perhaps too many confusing symbols when you try to do a completion.

You can disable the automatic generated global style hooks by setting the variable \texttt{TeX-auto-global} to \texttt{nil}.

TeX-macro-global
[User Option]
Directories containing the site’s \TeX style files.

TeX-style-global
[User Option]
Directory containing hand generated \TeX information.
These correspond to \TeX macros shared by all users of a site.

TeX-auto-global
[User Option]
Directory containing automatically generated information.
For storing automatic extracted information about the \TeX macros shared by all users of a site.

5.5.2 Automatic Customization for a User
You should specify where you store your private \TeX macros, so \texttt{AUCTeX} can extract their information. The extracted information will go to the directories listed in \texttt{TeX-auto-private}

Use \texttt{M-x TeX-auto-generate RET} to extract the information.

TeX-macro-private
[User Option]
Directories where you store your personal \TeX macros. The value defaults to the directories listed in the \texttt{TEXINPUTS} and \texttt{BIBINPUTS} environment variables or to the respective directories in \texttt{$TEXMFHOME} of \texttt{kpsewhich} setting if no results can be obtained from the environment variables.

TeX-auto-private
[User Option]
List of directories containing automatically generated \texttt{AUCTeX} style files. These correspond to the personal \TeX macros.

TeX-auto-generate tex auto
[Command]
\texttt{(M-x TeX-auto-generate RET)} Generate style hook for \texttt{tex} and store it in \texttt{auto}. If \texttt{tex} is a directory, generate style hooks for all files in the directory.

TeX-style-private
[User Option]
List of directories containing hand generated \texttt{AUCTeX} style files. These correspond to the personal \TeX macros.
5.5.3 Automatic Customization for a Directory

AUCTeX can update the style information about a file each time you save it if \texttt{TeX-auto-save} option is enabled. Saved information will be stored in the directory \texttt{TeX-auto-local}, set to \texttt{"auto"} by default.

The advantage of doing this is that macros, labels, etc. defined in any file in a multifile document will be known in all the files in the document. The disadvantage is that saving will be slower. To disable, set \texttt{TeX-auto-local} to \texttt{nil}.

\begin{itemize}
    \item \textbf{TeX-style-local} [User Option]
        Directory containing hand generated \TeX{} information.
        These correspond to \TeX{} macros found in the current directory.
    \item \textbf{TeX-auto-local} [User Option]
        Directory containing automatically generated \TeX{} information.
        These correspond to \TeX{} macros found in the current directory.
    \item \textbf{TeX-auto-save-aggregate} [User Option]
        When non-nil, save parsed information in \texttt{auto} subdirectory of master directory.
        Otherwise, save in each \texttt{auto} subdirectory of the parsed file.
        Subdirectory name is actually taken from \texttt{TeX-auto-local}.
\end{itemize}

5.6 Writing Your Own Style Support

See Section 5.5 [Automatic], page 80, for a discussion about automatically generated global, private, and local style files. The hand generated style files are equivalent, except that they by default are found in style directories instead of auto directories.

If you write some useful support for a public \TeX{} style file, please send it to us.

5.6.1 A Simple Style File

Here is a simple example of a style file.

\begin{verbatim}
;;; book.el - Special code for book style.

(TeX-add-style-hook
 "book"
 (lambda ()
  (LaTeX-largest-level-set "part")
TeX-dialect)
\end{verbatim}

The example is from the AUCTeX sources and is loaded for any \LaTeX{} document using the book document class (or style before \LaTeX{}2e). (Note that the above code is much simplified for explanatory purpose.) The file specifies that the largest kind of section in such a document is \texttt{part}. The interesting thing to notice is that the style file defines an (anonymous) function, and adds it to the list of loaded style hooks by calling \texttt{TeX-add-style-hook}.

The first time the user indirectly tries to access some style-specific information, such as the largest sectioning command available, the style hooks for all files directly or indirectly
read by the current document are executed. The actual files will only be evaluated once, but the hooks will be called for each buffer using the style file.

Note that the basename of the style file and the name of the style hook should usually be identical.

**TeX-add-style-hook**  *style hook &optional dialect-expr*  [Function]

Add hook to the list of functions to run when we use the \TeX{} file style and the current dialect is one in the set derived from dialect-expr. When dialect-expr is omitted, then hook is allowed to be run whatever the current dialect is.

**dialect-expr** may be one of:

- A symbol indicating a singleton containing one basic \TeX{} dialect, this symbol shall be selected among:
  
  :latex       For all files in \LaTeX{} mode, or any mode derived thereof.
  
  :bibtex      For all files in Bib\TeX{} mode, or any mode derived thereof.
  
  :texinfo     For all files in Texinfo mode.
  
  :plain-tex   For all files in plain-\TeX{} mode, or any mode derived thereof.
  
  :context     For all files in Con\TeX{}t mode.
  
  :classopt    For class options of \LaTeX{} document. This is provided as pseudo-dialect for style hooks associated with class options.

- A logical expression like:
  
  (or dialect-expression1 ... dialect-expression_n)
  For union of the sets of dialects corresponding to dialect-expression1 through dialect-expression_n
  
  (and dialect-expression1 ... dialect-expression_n)
  For intersection of the sets of dialects corresponding to dialect-expression1 through dialect-expression_n
  
  (nor dialect-expression1 ... dialect-expression_n)
  For complement of the union sets of dialects corresponding to dialect-expression1 through dialect-expression_n relatively to the set of all supported dialects
  
  (not dialect-expr)
  For complement set of dialect corresponding to dialect-expr relatively to the set of all supported dialects

In case of adding a style hook for \LaTeX{}, when calling function TeX-add-style-hook it is thought more futureproof for argument dialect-expr to pass constant TeX-dialect currently defined to :latex, rather than passing :latex directly.

**TeX-dialect**  [Constant]

Default dialect for use with function TeX-add-style-hook for argument dialect-expr when the hook is to be run only on \LaTeX{} file, or any mode derived thereof.
5.6.2 Adding Support for Macros

The most common thing to define in a style hook is new symbols (\TeX macros). Most likely along with a description of the arguments to the function, since the symbol itself can be defined automatically.

Here are a few examples from latex.el.

```
(TeX-add-style-hook
 "latex"
 (lambda ()
  (TeX-add-symbols
   ('("arabic" TeX-arg-counter)
   ('("label" TeX-arg-define-label)
   ('("ref" TeX-arg-ref)
   ('("newcommand" TeX-arg-define-macro [ "Number of arguments" ] t)
   ('("newtheorem" TeX-arg-define-environment
      [ TeX-arg-environment "Numbered like" ]
      t [ TeX-arg-counter "Within counter" ])))))
```

TeX-add-symbols symbol ...  [Function]

Add each symbol to the list of known symbols.

Each argument to TeX-add-symbols is a list describing one symbol. The head of the list is the name of the symbol, the remaining elements describe each argument.

If there are no additional elements, the symbol will be inserted with point inside braces. Otherwise, each argument of this function should match an argument of the \TeX macro. What is done depends on the argument type.

If a macro is defined multiple times, AUCTeX will choose the one with the longest definition (i.e. the one with the most arguments).

Thus, to overwrite

'("tref" 1) ; one argument

you can specify

'("tref" TeX-arg-ref ignore) ; two arguments

ignore is a function that does not do anything, so when you insert a ‘tref’ you will be prompted for a label and no more.

You can use the following types of specifiers for arguments:

- **string** Use the string as a prompt to prompt for the argument.
- **number** Insert that many braces, leave point inside the first. 0 and -1 are special. 0 means that no braces are inserted. -1 means that braces are inserted around the macro and an active region (e.g. ‘{\tiny foo}’). If there is no active region, no braces are inserted.
- **nil** Insert empty braces.
- **t** Insert empty braces, leave point between the braces.
- **other symbols** Call the symbol as a function. You can define your own hook, or use one of the predefined argument hooks.
list    If the car is a string, insert it as a prompt and the next element as initial input. Otherwise, call the car of the list with the remaining elements as arguments.

vector Optional argument. If it has more than one element, parse it as a list, otherwise parse the only element as above. Use square brackets instead of curly braces, and is not inserted on empty user input.

A lot of argument hooks have already been defined. The first argument to all hooks is a flag indicating if it is an optional argument. It is up to the hook to determine what to do with the remaining arguments, if any. Typically the next argument is used to overwrite the default prompt.

\texttt{TeX-arg-conditional}

Implements if \texttt{expr then else}. If \texttt{expr} evaluates to true, parse \texttt{then} as an argument list, else parse \texttt{else} as an argument list.

\texttt{TeX-arg-literal}

Insert its arguments into the buffer. Used for specifying extra syntax for a macro.

\texttt{TeX-arg-free}

Parse its arguments but use no braces when they are inserted.

\texttt{TeX-arg-eval}

Evaluate arguments and insert the result in the buffer.

\texttt{TeX-arg-label}

Prompt for a label completing with known labels. If \texttt{Ref\LaTeX} is active, prompt for the reference format.

\texttt{TeX-arg-ref}

Prompt for a label completing with known labels. If \texttt{Ref\LaTeX} is active, do not prompt for the reference format. Usually, reference macros should use this function instead of \texttt{TeX-arg-label}.

\texttt{TeX-arg-index-tag}

Prompt for an index tag. This is the name of an index, not the entry.

\texttt{TeX-arg-index}

Prompt for an index entry completing with known entries.

\texttt{TeX-arg-length}

Prompt for a \LaTeX\ length completing with known lengths.

\texttt{TeX-arg-macro}

Prompt for a \TeX\ macro with completion.

\texttt{TeX-arg-date}

Prompt for a date, defaulting to the current date. The format of the date is specified by the \texttt{TeX-date-format} option. If you want to change the format when the \texttt{babel} package is loaded with a specific language, set \texttt{TeX-date-format} inside the appropriate language hook (for details see Section 5.4.1 [European], page 75).
TeX-arg-version
Prompt for the version of a file, using as initial input the current date.

TeX-arg-environment
Prompt for a \LaTeX\ environment with completion.

TeX-arg-cite
Prompt for a Bib\TeX\ citation. If the variable TeX-arg-cite-note-p is non-nil, ask also for optional note in citations.

TeX-arg-counter
Prompt for a \LaTeX\ counter completing with known counters.

TeX-arg-savebox
Prompt for a \LaTeX\ savebox completing with known saveboxes.

TeX-arg-file
Prompt for a filename in the current directory, and use it with the extension.

TeX-arg-file-name
Prompt for a filename and use as initial input the name of the file being visited in the current buffer, with extension.

TeX-arg-file-name-sans-extension
Prompt for a filename and use as initial input the name of the file being visited in the current buffer, without extension.

TeX-arg-input-file
Prompt for the name of an input file in \TeX\’s search path, and use it without the extension. Run the style hooks for the file. (Note that the behavior (type of prompt and inserted file name) of the function can be controlled by the variable TeX-arg-input-file-search.)

TeX-arg-define-label
Prompt for a label completing with known labels. Add label to list of defined labels.

TeX-arg-define-length
Prompt for a \LaTeX\ length completing with known lengths. Add length to list of defined lengths.

TeX-arg-define-macro
Prompt for a \TeX\ macro with completion. Add macro to list of defined macros.

TeX-arg-define-environment
Prompt for a \LaTeX\ environment with completion. Add environment to list of defined environments.

TeX-arg-define-cite
Prompt for a Bib\TeX\ citation.

TeX-arg-define-counter
Prompt for a \LaTeX\ counter.

TeX-arg-define-savebox
Prompt for a \LaTeX\ savebox.
TeX-arg-document
Prompt for a \LaTeX document class, using \texttt{LaTeX-default-style} as default value and \texttt{LaTeX-default-options} as default list of options. If the variable \texttt{TeX-arg-input-file-search} is \texttt{t}, you will be able to complete with all \LaTeX classes available on your system, otherwise classes listed in the variable \texttt{LaTeX-style-list} will be used for completion. It is also provided completion for options of many common classes.

LaTeX-arg-usepackage
Prompt for \LaTeX packages. If the variable \texttt{TeX-arg-input-file-search} is \texttt{t}, you will be able to complete with all \LaTeX packages available on your system. It is also provided completion for options of many common packages.

TeX-arg-bibstyle
Prompt for a \BibTeX style file completing with all style available on your system.

TeX-arg-bibliography
Prompt for \BibTeX database files completing with all databases available on your system.

TeX-arg-corner
Prompt for a \LaTeX side or corner position with completion.

TeX-arg-lr
Prompt for a \LaTeX side with completion.

TeX-arg-tb
Prompt for a \LaTeX side with completion.

TeX-arg-pagestyle
Prompt for a \LaTeX pagestyle with completion.

TeX-arg-verb
Prompt for delimiter and text.

TeX-arg-verb-delim-or-brace
Prompt for delimiter and text. This function is similar to \texttt{TeX-arg-verb}, but is intended for macros which take their argument enclosed in delimiters or in braces.

TeX-arg-pair
Insert a pair of numbers, use arguments for prompt. The numbers are surrounded by parentheses and separated with a comma.

TeX-arg-size
Insert width and height as a pair. No arguments.

TeX-arg-coordinate
Insert x and y coordinates as a pair. No arguments.

LaTeX-arg-author
Prompt for document author, using \texttt{LaTeX-default-author} as initial input.
TeX-read-hook
  Prompt for a \LaTeX\ hook and return it.

TeX-arg-hook
  Prompt for a \LaTeX\ hook and insert it as a \TeX\ macro argument.

TeX-read-key-val
  Prompt for a ‘key=value’ list of options and return them.

TeX-arg-key-val
  Prompt for a ‘key=value’ list of options and insert it as a \TeX\ macro argument.

If you add new hooks, you can assume that point is placed directly after the previous argument, or after the macro name if this is the first argument. Please leave point located after the argument you are inserting. If you want point to be located somewhere else after all hooks have been processed, set the value of \TeX\-exit-mark. It will point nowhere, until the argument hook sets it.

Some packages provide macros that are rarely useful to non-expert users. Those should be marked as expert macros using \TeX\-declare-expert-macros.

\TeX\-declare-expert-macros \texttt{style} macros... \hfill \texttt{[Function]}

Declare macros as expert macros of \texttt{style}.

Expert macros are completed depending on \TeX\-complete-expert-commands.

5.6.3 Adding Support for Environments

Adding support for environments is very much like adding support for \TeX\ macros, except that each environment normally only takes one argument, an environment hook. The example is again a short version of \texttt{latex.el}.

\begin{verbatim}
(\TeX\-add-style-hook
 "latex"
 (lambda ()
  (LaTeX-add-environments
   '(("document" LaTeX-env-document)
     '(("enumerate" LaTeX-env-item)
       '(("itemize" LaTeX-env-item)
         '(("list" LaTeX-env-list))))))

It is completely up to the environment hook to insert the environment, but the function \TeX\-insert-environment may be of some help. The hook will be called with the name of the environment as its first argument, and extra arguments can be provided by adding them to a list after the hook.

For simple environments with arguments, for example defined with ‘\texttt{\newenvironment}\’, you can make AUCTeX prompt for the arguments by giving the prompt strings in the call to \LaTeX\-add-environments. The fact that an argument is optional can be indicated by wrapping the prompt string in a vector.

For example, if you have defined a \texttt{loop} environment with the three arguments \texttt{from}, \texttt{to}, and \texttt{step}, you can add support for them in a style file.

%% loop.sty
\newenvironment{loop}{...}{...} 
;; loop.el

(TeX-add-style-hook
 "loop"
 (lambda ()
   (LaTeX-add-environments
    ('"loop" "From" "To" "Step"))))

If an environment is defined multiple times, AUCTeX will choose the one with the longest definition. Thus, if you have an enumerate style file, and want it to replace the standard \LaTeX\ enumerate hook above, you could define an enumerate.el file as follows, and place it in the appropriate style directory.

(TeX-add-style-hook
 "latex"
 (lambda ()
   (LaTeX-add-environments
    ('"enumerate" LaTeX-env-enumerate foo))))

(defun LaTeX-env-enumerate (environment &optional _ignore) ...)

The symbol foo will be passed to LaTeX-env-enumerate as the second argument, but since we only added it to overwrite the definition in latex.el it is just ignored.

LaTeX-add-environments env ...
Add each env to list of loaded environments.

LaTeX-insert-environment env [extra]
Insert environment of type env, with optional argument extra.

Following is a list of available hooks for LaTeX-add-environments:

LaTeX-env-item
Insert the given environment and the first item.

LaTeX-env-item-args
Insert the given environment plus further arguments, and the first item. You can use this as a hook in case you want to specify multiple complex arguments just like in elements of \TeX\-add-symbols. Here is an example from enumitem.el in order to prompt for a `key=value' list to be inserted as an optional argument to the `itemize' environment:

(LaTeX-add-environments
 '"itemize" LaTeX-env-item-args
 [TeX-arg-key-val (LaTeX-enumitem-key-val-options)]))

LaTeX-env-figure
Insert the given figure-like environment with a caption and a label.

LaTeX-env-array
Insert the given array-like environment with position and column specifications.
LaTeX-env-label
Insert the given environment with a label.

LaTeX-env-label-args
Insert the given environment with a label and further arguments to the environment.

LaTeX-env-list
Insert the given list-like environment, a specifier for the label and the first item.

LaTeX-env-minipage
Insert the given minipage-like environment with position and width specifications.

LaTeX-env-tabular*
Insert the given tabular*-like environment with width, position and column specifications.

LaTeX-env-picture
Insert the given environment with width and height specifications.

LaTeX-env-bib
Insert the given environment with a label for a bibitem.

LaTeX-env-contents
Insert the given environment with a filename as its argument.

LaTeX-env-args
Insert the given environment with arguments. You can use this as a hook in case you want to specify multiple complex arguments just like in elements of \texttt{TeX-add-symbols}. This is most useful if the specification of arguments to be prompted for with strings and strings wrapped in a vector as described above is too limited.

Here is an example from \texttt{listings.el} which calls a function with one argument in order to prompt for a \texttt{key=value} list to be inserted as an optional argument of the \texttt{lstlisting} environment:

\begin{verbatim}
  (LaTeX-add-environments
   "\texttt{\lstlisting}" LaTeX-env-args
    [TeX-arg-key-val (LaTeX-listings-key-val-options)]))
\end{verbatim}

Some packages provide environments that are rarely useful to non-expert users. Those should be marked as expert environments using \texttt{LaTeX-declare-expert-environments}.

\texttt{LaTeX-declare-expert-environments style environments...} [Function]
Declare \texttt{environments} as expert environments of \texttt{style}.

5.6.4 Adding or Examining Other Information

5.6.4.1 Adding bibliographies in style hooks
You can also specify bibliographical databases and labels in the style file. This is probably of little use, since this information will usually be automatically generated from the \TeX file anyway.
**LaTeX-add-bibliographies bibliography** ...  
Add each bibliography to list of loaded bibliographies.

**LaTeX-add-labels label** ...  
Add each label to the list of known labels.

### 5.6.4.2 Examining Package/Class Options

In \LaTeX \TeX documents, style hooks can find the package names and those options given as optional argument(s) of `\usepackage` in `\LaTeX-provided-package-options`.

**LaTeX-provided-package-options**  
Buffer local variable holding alist of options provided to \LaTeX packages. Each element is a cons cell (package . option-list). For example, its value will be

```
(("babel" . ("german"))
 ("geometry" . ("a4paper" "top=2cm" "left=2.5cm" "right=2.5cm"))
 ...)
```

You can examine whether there is a specific package-option pair by `LaTeX-provided-package-options-member`.

**LaTeX-provided-package-options-member package option**  
Return non-nil if option has been given to package. The value is actually the tail of the list of options given to package.

There are similar facilities for class names and those options given in `\documentclass` declaration.

**LaTeX-provided-class-options**  
Buffer local variable holding alist of options provided to \LaTeX classes. Each element is a cons cell (class . option-list). For example, its value will be

```
(("book" . ("a4paper" "11pt" "openany" "fleqn"))
 ...)
```

**LaTeX-provided-class-options-member class option**  
Return non-nil if option has been given to class. The value is actually the tail of the list of options given to class.

**LaTeX-match-class-option regexp**  
Check if a documentclass option matching regexp is active. Return first found class option matching regexp, or nil if not found.

These functions are also useful to implement customized predicate(s) in `\TeX-view-predicate-list`. See Section 4.2.1 [Starting Viewers], page 62.

### 5.6.4.3 Adding Support for Option Completion

When the user inserts `\usepackage` by `C-c C-m`, AUCTeX asks for the optional arguments after the package name is given. The style file of that package can provide completion support for the optional arguments.
LaTeX-packagename-package-options

List of optional arguments available for the package.

Here is an excerpt from `acronym.el`:

(defvar LaTeX-acronym-package-options
  '("footnote" "nohyperlinks" "printonlyused" "withpage"
    "smaller" "dua" "nolist")
  "Package options for the acronym package."
)

When the package accepts key-value style optional arguments, more sophisticated completion support is needed. The package style file can provide dynamic completion support by custom elisp function.

LaTeX-packagename-package-options

This function should ask the user for optional arguments and return them as a string, instead of built-in option query facility. When this function is defined, AUCTeX calls it with no argument.

Here is an excerpt from `acro.el`:

(defun LaTeX-acro-package-options ()
  "Prompt for package options for the acro package."
  (TeX-read-key-val t LaTeX-acro-package-options-list))

As you can see in the above example, a utility function TeX-read-key-val is available to read key-value pair(s) from users.

Note that defvar or defun of LaTeX-packagename-package-options should be at the top level of the style file and not inside the style hook, because the style hook is not yet called when the user inputs the optional arguments in response to C-c C-m.

There are similar facilities for class options. When the user inserts `\documentclass` by C-c C-e, the respective class style file can provide completion support for the optional arguments.

LaTeX-classname-class-options

List of optional arguments available for the class.

LaTeX-classname-class-options

Which see.

5.6.5 Automatic Extraction of New Things

The automatic TeX information extractor works by searching for regular expressions in the TeX files, and storing the matched information. You can add support for new constructs to the parser, something that is needed when you add new commands to define symbols.

For example, in the file `macro.tex` I define the following macro.

\newcommand{\newmacro}[5][%\def#1{#3\index{#4@#5~cite{#4}}\nocite{#4}}%\def#2{#5\index{#4@#5~cite{#4}}\nocite{#4}}%}
AUCTeX will automatically figure out that `newmacro' is a macro that takes five arguments. However, it is not smart enough to automatically see that each time we use the macro, two new macros are defined. We can specify this information in a style hook file.

;;; macro.el --- Special code for my own macro file.

;;; Code:

(defvar TeX-newmacro-regexp
  "(\\newmacro\{\[a-zA-Z]+\}\{\\[a-zA-Z]+\}\}" (1 2) TeX-auto-multi
"Matches \newmacro definitions."
)

(defvar TeX-auto-multi nil "Temporary for parsing \newmacro definitions.")

(defun TeX-macro-cleanup ()
  "Move symbols from `TeX-auto-multi' to `TeX-auto-symbol'."
  (mapc (lambda (list)
    (mapc (lambda (symbol)
      (setq TeX-auto-symbol
        (cons symbol TeX-auto-symbol)))
      list))
    TeX-auto-multi))

(defun TeX-macro-prepare ()
  "Clear `Tex-auto-multi' before use."
  (setq TeX-auto-multi nil))

(add-hook 'TeX-auto-prepare-hook #'TeX-macro-prepare)
(add-hook 'TeX-auto-cleanup-hook #'TeX-macro-cleanup)

(TeX-add-style-hook
"macro"
(lambda ()
  (TeX-auto-add-regexp TeX-newmacro-regexp)
  (TeX-add-symbols "(newmacro"
    TeX-arg-macro
    (TeX-arg-macro "Capitalized macro: \"
      t
    "BibTeX entry: "
    nil)))))

;;; macro.el ends here

When this file is first loaded, it adds a new entry to TeX-newmacro-regexp, and defines a function to be called before the parsing starts, and one to be called after the parsing is
done. It also declares a variable to contain the data collected during parsing. Finally, it adds a style hook which describes the ‘newmacro’ macro, as we have seen it before.

So the general strategy is: Add a new entry to `{TeX-newmacro-regexp}`. Declare a variable to contain intermediate data during parsing. Add hook to be called before and after parsing. In this case, the hook before parsing just initializes the variable, and the hook after parsing collects the data from the variable, and adds them to the list of symbols found.

**TeX-auto-regexp-list**

List of regular expressions matching TeX macro definitions.

The list has the following format `((regexp match table) . . . )`, that is, each entry is a list with three elements.

- **regexp**: Regular expression matching the macro we want to parse.
- **match**: A number or list of numbers, each representing one parenthesized subexpression matched by `regexp`.
- **table**: The symbol table to store the data. This can be a function, in which case the function is called with the argument `match`. Use `TeX-match-buffer` to get match data. If it is not a function, it is presumed to be the name of a variable containing a list of match data. The matched data (a string if `match` is a number, a list of strings if `match` is a list of numbers) is put in front of the table.

**TeX-auto-prepare-hook nil**

List of functions to be called before parsing a TeX file.

**TeX-auto-cleanup-hook nil**

List of functions to be called after parsing a TeX file.
Appendix A Copying, Changes, Development, FAQ, Texinfo Mode

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A.2 Changes and New Features

News in 13.3

- AUCTeX now requires GNU Emacs 26.1 or higher.
- \LaTeX{} abbrevs are now available in docTeX mode buffers.
- AUCTeX temporarily rebinds the variable gc-cons-percentage to a higher value during parsing which speeds up the process significantly. The memory pressure should still be acceptable, even on older machines.
- Macros provided by the xparse package are part of \LaTeX{} kernel since October 2020. AUCTeX tracks this change and the content of xparse.el is moved into latex.el and font-latex.el respectively.
- The variable preview-scale-function is now allowed as a file-local variable where the assigned value can only be between 0.1 and 10.

News in 13.2

- AUCTeX no longer refuses to insert dollar sign when you type $ at point where AUCTeX thinks the current math mode didn’t start with dollar(s). AUCTeX assumes the user knows that it isn’t in math mode actually.
  You can keep the former behavior by enabling the new customize option TeX-refuse-unmatched-dollar.
- AUCTeX supports completion-at-point of macro and environment arguments in \LaTeX{} buffers. The responsible function recognizes the argument position and extracts the corresponding candidates from the variables TeX-symbol-list and LaTeX-environment-list.
• AUCTeX underlines the argument of macros which produce underlined text in the final product with font-latex-underline-face. The corresponding keyword class is called underline-command. See Section 3.1.1 [Fontification of macros], page 43, if you dislike this feature and wish to deactivate it.

• Support for the Siyek document viewer is added.

• AUCTeX now requires GNU Emacs 25.1 or higher.

• AUCTeX tracks the change in Emacs where initial inputs in the minibuffer during queries are getting phased out. Queries for the mandatory arguments of macros and environments are adjusted where applicable. The value which will be used after hitting RET without other input is shown in the prompt in parentheses prefixed with 'default'. For this change the signature of the function TeX-arg-length is altered. The old argument list was:

(defun TeX-arg-length (optional &optional prompt
initial-input definition default)

whereas the new one is:

(defun TeX-arg-length (optional &optional prompt
default initial-input definition)

Note the position change of DEFAULT.

• Indenting of conditionals is improved. Code inside constructs like ‘\ifx . \else . \fi’ is correctly indented. An interface for style files is also introduced which can add their macros to the indentation engine. Check the file algpseudocode.el for an example.

• You can optionally enable indent inside square brackets ‘[ ]’ by new user options TeX-indent-open-delimiters and TeX-indent-close-delimiters. See Section 2.9 [Indenting], page 36.

• Now tex-buf.el is merged into tex.el and no longer exists. If your personal code has (require 'tex-buf), one of the following prescriptions would serve.

1. Remove (require 'tex-buf).
2. Replace it with (require 'tex).
3. Replace it with (require 'latex).

• When you edit a document divided into multiple files, auto parsed information for all sub files are saved under auto subdirectory at master directory when TeX-parse-self and TeX-auto-save options are enabled. Now you can have support .el file saved under auto subdirectory of each directory of the sub file when the sub files aren’t located at the master directory.

To achieve that, set new user option TeX-auto-save-aggregate to nil.

• There was another hook where former dynamic free variables could be used. The usage was invalidated at version 13.1, by introduction of lexical binding over AUCTeX.

The functions in TeX-region-hook could access the free variables master-buffer and orig-buffer. Those are now named TeX-region-master-buffer and TeX-region-orig-buffer, respectively.
News in 13.1

- In math environments ‘\texttt{gather}', ‘\texttt{gather*}', ‘\texttt{gathered}', ‘\texttt{multline}' and ‘\texttt{multline*}', fill commands such as M-q and C-c C-q C-e are disabled. This sorts out the inconsistency between those and ‘\texttt{equation}', ‘\texttt{displaymath}' environments, in latter of which filling is already disabled.

  If you want filling in such environments, customize \texttt{LaTeX-indent-environment-list} to remove them.

  Auto fill continues to work in such environment anyway.

  In addition, AUCTeX adds support of alignment at ‘&' sign in ‘\texttt{align}’-like environments such as ‘\texttt{alignat}', ‘\texttt{aligned}' and so on, as well as ‘\texttt{matrix}'-like environments such as ‘\texttt{pmatrix}', ‘\texttt{bmatrix}' and so on.

- Now two commands ‘\texttt{Texindex}' and ‘\texttt{Texi2dvi}' are available when you type C-c C-c in Texinfo mode. The command ‘\texttt{Texindex}' runs \texttt{texindex} on index files and ‘\texttt{Texi2dvi}' runs \texttt{pdftexi2dvi} or \texttt{texi2dvi} according to the value of \texttt{TeX-PDF-mode}.

  So you can typeset Texinfo documents into PDF or DVI format from within AUCTeX.

- AUCTeX's own help messages for \LaTeX errors are now shown only for \LaTeX runs. AUCTeX shows raw error/warning messages found in .log files for runs of formats other than \LaTeX, such as plain \TeX, \ConTeXt and Texinfo, as it does even for \LaTeX runs when it can't find a matching entry in its own help message catalogue.

  Due to this change, customize option \texttt{TeX-error-description-list} can no longer have a fallback entry that matches any error. If your customized value includes such entry, typically ‘(".*" . "No help available")', please remove it.

- Two functions \texttt{TeX-split-string} and \texttt{TeX-assoc} are now obsolete and will be removed in future release. If your personal code uses these functions, use \texttt{split-string} and \texttt{assoc-string} instead.

- The function \texttt{TeX-read-key-val} now accepts a function call as second argument. This change should help AUCTeX style writers who use \texttt{TeX-arg-key-val} and have to deal with dynamic key-values. Example of usage:

  (TeX-add-style-hook "foo"
   (lambda ()
     (TeX-add-symbols
      ('"bar" (TeX-arg-key-val (function-returning-key-val))))))

- Since AUCTeX 12.2, C-x C-w accidentally disabled the parse on save in that buffer, even when you enabled \texttt{TeX-auto-save} option. This bug was fixed.

- AUCTeX now requires GNU Emacs 24.3 or higher.

- Old implementations for viewers were discarded, as announced long before. The variables \texttt{TeX-output-view-style} and \texttt{TeX-view-style} have no effect now. The former placeholders ‘%w' and ‘%vw' in \texttt{TeX-command-list} are ignored.

- AUCTeX now uses lexical binding which has been introduced in Emacs 24. This change should have no user-visible effect and require no manual adaptions except in the following cases.

  - Entries added to the customization variable \texttt{TeX-expand-list} also had access to variables \texttt{command} and \texttt{pos}. Those are now properly declared and named \texttt{TeX-expand-command} and \texttt{TeX-expand-pos}.  

Entries added to the customization variable `TeX-expand-list` had access to a variable `file` which was bound to `TeX-active-master`, i.e., it evaluated to either the master or region file. This usage must be replaced with either `TeX-active-master` or `TeX-active-master-with-quotes`.

Viewer entries in `TeX-view-program-list` also had access to a variable `file` which was bound to the name of the master or region file without extension. Instead, the function `TeX-active-master` has to be used now.

Macro argument parsing functions could set a variable `exit-mark` to the buffer position where point should be left after all arguments have been read. This variable is now named `TeX-exit-mark`.

The functions in `LaTeX-section-hook` had access or modified the previously undeclared variables `title`, `name`, `level`, `done-mark`, and `toc`. These variables are now properly declared and have the ‘`LaTeX-`’ prefix, e.g., `LaTeX-done-mark`.

The functions in `ConTeXt-numbered-section-hook` and `ConTeXt-unnumbered-section-hook` had access or modified the previously undeclared variables `title`, `name`, `level`, `done-mark`, and `reference`. These variables are now properly declared and have the ‘`ConTeXt-`’ prefix, e.g., `ConTeXt-title`.

The functions in `TeX-translate-location-hook` could access and modify the free variables `file`, `line`, `error`, `offset`, `context`, and `string`. Those are now properly declared variables with the prefix ‘`TeX-translate-location-`’, e.g., `TeX-translate-location-file`.

- The constant `LaTeX-dialect` has been renamed to `TeX-dialect` and moved from `latex.el` to `tex.el`. `LaTeX-dialect` now is an obsolete alias.

- The style `latexinfo.el` is removed from AUCTeX. `latexinfo.el` was meant to support latexinfo which in return was a LaTeX-2.09 extension of Texinfo, but didn’t manage to replace Texinfo.

- The style `siunitx.el` is updated to support package version 3. Key-value options provided by older package versions are removed, deprecated macros and units are not supported anymore.

- AUCTeX has preliminary support for LaTeX-hooks. Hooks provided by LaTeX kernel are known and available for completion in ‘`
\AddToHook`’, ‘`
\RemoveFromHook`’ and ‘`
\AddToHookNext`’.

- AUCTeX is now able to place all generated output files, including those that are produced by applications running under AUCTeX, temporary files related to region processing and `preview-latex` files, in an output directory. To use this feature, set the new user option `TeX-output-dir` to the absolute path of the output directory or a relative path which would be interpreted as being relative to the master file in a multifile document.

Note that this feature doesn’t work if the document includes sub file placed in sub directory below the main file via ‘`
\include`’ command.

- Many other bugs were fixed.

**News in 12.3**

- Support for ‘PSTricks’ is now PDF-oriented. AUCTeX no longer turns off PDF mode
for ‘PSTricks’ documents even without ‘pst-pdf’. It now sets up TeX-PDF-from-DVI option so that PDF output is generated when TeX-PDF-mode is enabled (default). Users who want DVI output should disable PDF mode explicitly by file local variable, or customize TeX-PDF-mode to nil.

• The function font-latex-update-font-lock has been obsoleted in order to fix ‘bug#37945’. That function was used by several style files in order to refresh fontification after adding new symbols or verbatim constructs. It is better to call font-lock-flush in the former case and font-latex-set-syntactic-keywords in the latter case. The function font-latex-update-font-lock still exists as a no-op which only shows a warning explaining how to update font-lock as mentioned above.

• Math expression highlighting was improved. Highlighting for documents with a lot of inline math expressions ‘$...$’ won’t get scrambled now (‘bug#33139’).

In addition, it is no longer recommended to customize font-latex-math-environments. Use texmathp-tex-commands instead. See Section 3.1.3 [Fontification of math], page 47.

• AUCTeX tracks changes in LaTeX2e 2020-02-02 release. AUCTeX supports the improvements to LaTeX font selection mechanism (NFSS). New macros like ‘\textsw’ or ‘\textulc’ are added to font insertion keyboard commands. See Section 2.2 [Font Specifiers], page 23, for details. Further, the entries in the menu ‘LaTeX’, ‘Insert Font’ are reorganized and adjusted accordingly.

Macros previously provided by textcomp.sty are now part of LaTeX kernel. AUCTeX tracks this change as well and support for the new macro ‘\legacyoldstylenums’ is added.

• Insertion of environments in LaTeX documents (i.e. C-c C-e) was improved. The former code had a few bugs, which sometimes resulted in either spurious empty line or spurious comment prefix, or both, especially when the region is active. Those bugs are now fixed.

• More bugs fixed, other minor features implemented.

News in 12.2

• AUCTeX reflects the changes in LaTeX2e 2019-10-01 release. ‘filecontents’ environment now takes an optional argument and can be used anywhere in a document. The macros ‘\Ref’ and ‘\labelformat’ are moved from varioref.sty to LaTeX kernel. ‘amsmath’ has a new macro ‘\overunderset’.

• A new method is implemented in preview-latex to adjust the foreground colors of generated images to those of Emacs, when the LaTeX command produces PDF. The traditional method became invalid because of the change introduced in Ghostscript 9.27. Unfortunately, the new method doesn’t work due to a bug in Ghostscript 9.27 and is valid only for Ghostscript > 9.27. There is also a fallback method for gs 9.27 users which displays plain “black on white” images. For successful function of preview-latex, the users are encouraged to set up the new user option preview-pdf-color-adjust-method to choose appropriate option among the three: new, traditional and fallback method.

• AUCTeX has support for the Flymake package in Emacs 26 or newer. To enable, call M-x flymake-mode RET or add this to your .emacs file:
(add-hook 'LaTeX-mode-hook #'flymake-mode)

• The way the option TeX-record-buffer is used was corrected. It was used in just the
opposite way as the document says. Erase the customization if you have customized
this option since it now acts in reverse to your expectation.

• A former customize option japanese-TeX-command-list is removed. Use japanese-
TeX-engine-default, or if it’s really necessary, customize TeX-command-list directly
if the task which the option used to carry is required.

• Support for standard \LaTeX\ without e-\LaTeX\ extension is now very limited. It doesn’t
work if raw \TeX\ code is put on the command line to invoke latex command. It also
fails for region compilation (C-c C-r and so on) with documents of non-ascii file name.
In addition, it no longer works with preview-latex. We consider this incompatibility is
permisible because e-\LaTeX\ extension is enabled for standard \LaTeX\ by default long ago.
\LaTeX\ variants such as Xe\LaTeX\ and Lua\LaTeX\ are not affected.

• Key binds in Texinfo mode are improved. Typing $, ^, _ and \ now just self-inserts
without pointless side effects in Texinfo mode.
In addition, the option TeX-electric-escape is now effective in Texinfo mode. When
it is enabled, typing @ will invoke TeX-electric-macro offering completion in similar
style with other TEX modes of AUCTeX.

• Fontification support for `biblatex' package is improved and updated to macros pro-
vided by package version 3.12. For qualified lists, at least 2 mandatory arguments are
fontified.

• Support for column specifiers `w' and `W' provided by `array' package is added to
array.el. The correct counting of columns only works when the `align' parameter is
enclosed in braces, e.g., `w{1}{3cm}'. The short version `wl{3cm}' is not supported.

• Entries for `PDF Tools’ are added in TeX-view-program-list-builtin for Windows
and macOS. This viewer can be configured under these operating systems with an entry
like this in an init file:

(setq TeX-view-program-selection '((output-pdf "PDF Tools")))

• Several other bugs were fixed, many minor features were added.

News in 12.1

• AUCTeX now requires GNU Emacs 24 or higher. Support for XEmacs has been
dropped.

• Besides the change in the supported version of Emacs, there has been no functional
change in this release, which is equivalent to version 11.92.

News in 11.92

• preview-latex is compatible with Ghostscript 9.22 where the operator `.runandhide' is
removed. All occurrences of `.runandhide' in preview-latex are replaced by alternative
code making it work with Ghostscript 9.22 again.

• AUCTeX has a new customize option TeX-math-input-method-off-regexp. When
you begin to input a math formula, the current input method is turned off if its name
matches this regular expression.
In fact this variable was introduced long before, but has not been documented in info files nor turned into a customize option with `defcustom` until this release.

- The window system focus is pulled back to Emacs when viewing with evince-compatible viewers if a new customize option `TeX-view-evince-keep-focus` is non-nil.
- The usual dose of bug fixes was administered.

**News in 11.91**

- Now AUCTeX has a logo. The \LaTeX\ code to create it is available in the `etc/` directory of the package.
- Add support for `upmendex`, an extension of `makeindex` capable of sorting indexes by unicode based ICU.
- Fix `preview-latex` to interact correctly with Japanese \LaTeX. The parsing routine was made robust not to be confused by the 7-bit encoding of Japanese text and the necessary option to \LaTeX command is kept even when preamble caching is enabled.
- The new “Glossaries” entry in `TeX-command-list` runs the command `makeglossaries`.
- Fontification of control symbols has been improved. Characters defined in `font-latex-match-simple-exclude-list` do not receive any fontification. In Doc\TeX mode, the character ‘_’ is removed from `font-latex-match-simple-exclude-list` in order to fontify macros like `\_module_foo:nnn` correctly.
- Fontification of in-line environments has been improved. Optional and/or mandatory argument(s) to environments are not fontified.
- `preview.sty` loads `luatex85.sty` if possible and should be compatible with newer lu\LaTeX versions.
- AUCTeX has a new customize option `TeX-ispell-verb-delimiters`. This string contains usual characters used as delimiters for in-line verbatim macros like `\verb`. Text between delimiters after an in-line verbatim macro will be skipped during spell checking.
- Fontification of in-line verbatim macros has been improved. `font-latex.el` recognizes an optional or a mandatory argument for macros like `\verb` from `fancyverb.sty`, `\mint` and `\mintinline` from `minted.sty` and fontifies verbatim content correctly.
- AUCTeX can put and parse labels in optional argument of environments. Inserting labels is done by new function `LaTeX-env-label-as-keyval`. A new customize option `LaTeX-listing-label` is available as prefix to labels in code typesetting environments, e.g. `\lstlisting` environment provided by `listings` package. `LaTeX-listing-label` defaults to `lst:`. Parsing of labels for later referencing relies on two requirements:
  1. Label should come as last key-value argument, and
  2. label must be enclosed in braces, e.g.

```
\begin{lstlisting}[caption=Some Caption,label={lst:foo}]
...
\end{lstlisting}
```
- The function `LaTeX-label` now takes a second optional argument `NO-INSERT`. When non-nil, `LaTeX-label` reads a label and returns it as a string. This argument is also passed to any function bound to `LaTeX-label-function` (see next item).
• **Incompatible change**: The signature for the function passed with the customize option \texttt{LaTeX-label-function} has changed. The function bound to this variable is now expected to take an optional second argument \texttt{NO-INSERT}. When this argument is \texttt{non-nil}, the function should read and only return a label as a string; insertion is done by another function.

• Directory local variables were ineffective for \texttt{japanese-latex-mode} and \texttt{japanese-plain-tex-mode}. This bug was fixed. (This was actually done in AUCTeX 11.90, but not advertised)

• The output of Japanese text from Japanese \TeX{} engines is decoded correctly for most cases, according to the encoding of the \TeX{} documents and the locale. The difference between MS Windows, macOS and unix-like OS is taken into account. (This was actually done in AUCTeX 11.90, but not advertised)

• Quite a few new \LaTeX{} packages are supported.

• As usual, many bugs were fixed.

**News in 11.90**

• In addition to the completion performed by \texttt{TeX-complete-symbol}, AUCTeX now also supports the new Emacs standard completion-at-point facility (see the Emacs command \texttt{completion-at-point}). This also means that modern completion UIs like \texttt{company-mode} work out of the box in \TeX{} and \LaTeX{} buffers. See Section 2.6 [Completion], page 32, for details.

• Completion is now aware of being inside a math environment and then completes math macros.

• AUCTeX is able to display several levels of super- and subscripts, each one raised above and a bit smaller than its basis. For this feature, have a look at the customize options \texttt{font-latex-fontify-script} (especially the new values \texttt{multi-level} and \texttt{invisible}) and \texttt{font-latex-fontify-script-max-level}. Also, the script characters ‘\^{'}’ and ‘\_’ are also fontified with a special face named \texttt{font-latex-script-char-face}. See Section 3.1.3 [Fontification of math], page 47, for details.

• Parsing of format specification in various tabular environments has been improved. The function \texttt{LaTeX-insert-item} (C-c LFD) inserts suitable number of ampersands for ‘\{num\}\{cols\}’ constructs. Style files for \LaTeX{} packages ‘tabularx’, ‘tabulary’, ‘longtable’, ‘dcolumn’ and ‘siunitx’ are adapted to take advantage of this improvement.

• AUCTeX has a new Ispell dictionary \texttt{tex-ispell.el} for macros and environments which will be skipped during spell checking. The activation of this feature is controlled by a new customize option \texttt{TeX-ispell-extend-skip-list}, which is set to \texttt{t} and activated by default.

• AUCTeX has a new customize option \texttt{TeX-raise-frame-function} that is currently only used by Evince and Atril inverse search to raise the Emacs frame.

• When inserting a new float, AUCTeX will now prompt for a short-caption if the length of the caption provided is greater than a certain size. This size is controlled via a new user option \texttt{LaTeX-short-caption-prompt-length}. 

• Parsing of the compilation log has been reworked. You should encounter fewer mistaken files while navigating through errors and warnings.

• Two new user options, `TeX-ignore-warnings` and `TeX-suppress-ignored-warnings`, allow ignoring certain warnings after compilation of the document. See Section 4.3.1 [Ignoring warnings], page 67, for details.

• A new option, `TeX-PDF-from-DVI`, controls if and how to produce a PDF file by converting a DVI file. This supersedes `TeX-PDF-via-dvips-ps2pdf` which is still recognized but marked as obsolete and may be removed in future releases.

• Support for a number of external viewers has been added:
  • Atril viewer. Forward and inverse search requires version 1.9.1 or later to work.
  • dvout viewer on Windows. Note that this setup works when `TeX-source-correlate-method` is set to use ‘source-specials’ for DVI, e.g.:

        (setq TeX-source-correlate-method
              '((dvi . source-specials)
                 (pdf . synctex)))

    which is the default.
  • SumatraPDF viewer on Windows.
  • Zathura viewer. Forward and inverse search requires a recent version of the program to work (3.4 or later).

• A new function, `TeX-documentation-texdoc`, for reading documentation with ‘texdoc’ has been added. `TeX-doc` is still available but now `C-c ?` runs `TeX-documentation-texdoc`.

• AUCTeX has a new custom option `LaTeX-refTeX-cite-format-auto-activate` which controls the automatic activation of citation formats provided by RefTeX when a style file is loaded and RefTeX is enabled. Currently, `biblatex.el`, `harvard.el`, `jurabib.el` and `natbib.el` use this feature. If you have customized `refTeX-cite-format` and want to use your settings, you should set this variable to `nil`.

• AUCTeX now has limited support for the TikZ package. For the moment, this includes some basic support for prompting the user of arguments to the ‘\draw’ macro.

• The style `graphicx.el` went through a bigger overhaul. The optional argument of command ‘\includegraphics’ now supports key-val query; keys can independently be chosen anytime by pressing the , key. As a side effect, the variable `LaTeX-includegraphics-options-alist` is now no-op and is removed from `tex-style.el`. You can safely remove any customization of it from your init file. The mandatory argument of ‘\includegraphics’ knows about image file extensions supported by the used engine and offers them for inclusion.

• Support for other LaTeX packages was improved, and style files for several new packages were added.

• Many bugs were crushed along the way.

News in 11.89

• You can now run all commands needed to compile a document and then open the viewer with a single command: `TeX-command-run-all`, bound to `C-c C-a`. 
• Commands such as ‘LaTeX’ and ‘View’ can now be executed conveniently on the current section (or part, chapter, subsection, etc). See LaTeX-command-section and LaTeX-command-section-change-level. See Section 4.1.1 [Starting a Command], page 54, for details.

• Forward and backward search with Evince now also work when only a region of the document is compiled/viewed.

• To open the PDF output file you can now use also PDF Tools, a document viewer for Emacs. With it, as a plus, forward and backward search is accurate at word level.

• With new option TeX-PDF-via-dvips-ps2pdf it is possible to compile a document to DVI and then convert it to PDF using dvips–ps2pdf before viewing it.

• New option TeX-file-line-error allows to select file:line:error style for error messages.

• Indent ‘\[...\]’ math mode as a regular environment by default.

• Now AUCTeX suggests to run makeindex when appropriate.

• TeX-view-program-list can contain, as third optional element of each item, the name of the executable(s) needed to open the viewer.

• TeX-expand-list variable has been split into TeX-expand-list and TeX-expand-list-builtin. Only the former is intended to be customized by the user, the latter contains built-in expanders. You might want to keep in TeX-expand-list only new expansion strings.

• Before running commands like \TeX{} and \LaTeX{}, now AUCTeX performs some checks. If TeX-check-TeX is non-nil, it will test whether a working \TeX{} distribution is actually present in the system and available to Emacs. Instead, when TeX-check-engine is non-nil, before running \LaTeX{} commands AUCTeX will check whether the correct engine has been set, based upon known restrictions posed by \LaTeX{} packages.

• Basic support to Con\TeX{}t Mark IV has been added. Users can now select the Mark version to be used with new option ConTeXt-Mark-version, and AUCTeX is able to catch error messages in the output log of a Mark IV document.

• Support for tons of \LaTeX{} packages has been added.

• Numbers of bugs have been fixed, many minor features have been added.

News in 11.88

• TeX-PDF-mode is now enabled by default.

• Now TeX-previous-error works with \TeX{} commands if the new option TeX-parse-all-errors is non-nil, which is the default. When this option is non-nil, an overview of errors and warnings reported by the \TeX{} compiler can be opened with M-x TeX-error-overview RET. See Section 4.3 [Debugging], page 66, for details.

• Style file authors are encouraged to distinguish common from expert macros and environments, and mark the latter using TeX-declare-expert-macros and LaTeX-declare-expert-environments.

• Management of \LaTeX{} package options in the parser was improved. You might need to reparse your documents, especially if you loaded the ‘babel’ package with language options.
• Now you can insert ‘$...$’ or ‘\( ... \)’ by typing a single \$. To do this, customize the new option ‘\TeX-electric-math’. \TeX-math-close-double-dollar was removed. See Section 2.1 [Quotes], page 20, for details.

• C-c RET documentclass RET completes with all available \LaTeX classes, if the \TeX-arg-input-file-search variable is non-nil. Completion for class options of the standard \LaTeX classes is provided as well.

• New user options \LaTeX-default-author, \LaTeX-fontspec-arg-font-search, \LaTeX-fontspec-font-list-default, \TeX-date-format, and \TeX-insert-braces-alist. A new possible value (show-all-optional-args) for \TeX-insert-macro-default-style was added. The default value of \TeX-source-correlate-method has been changed.

• ‘biblatex’ support was greatly expanded. If parsing is enabled, AUCTeX looks at ‘backend’ option to decide whether to use Biber or BibTeX. The \LaTeX-biblatex-use-Biber variable was changed to be file local only and is no more customizable.

• With some \LaTeX classes, the default environment suggested by \LaTeX-environment (C-c C-e) when the current environment is ‘document’ was changed. With ‘beamer’ class the default environment is ‘frame’, with ‘letter’ it is ‘letter’, with ‘slides’ it is ‘slide’.

• Brace pairing feature was enhanced in \LaTeX documents. Support for ‘\bigl’, ‘\Bigl’, ‘\biggl’ and ‘\Biggl’, the same as the one for ‘\left’, was added to \TeX-insert-macro. For example, C-c RET bigl RET ( RET inserts ‘\bigl(\bigr)’.

You can insert brace pair ‘\{’, ‘\}’ and ‘\[’ by typing a single left brace if the new user option \LaTeX-electric-left-right-brace is enabled.

Macros ‘\langle’, ‘\lfloor’ and ‘\lceil’, which produce the left part of the paired braces, are treated similarly as ‘(’, ‘{’ and ‘[’ during the course of \TeX-insert-macro. See Section 2.1 [Quotes], page 20, for details.

• Support for dozens of \LaTeX packages was added.

• Tabular-like environments (‘tabular’, ‘tabular*’, ‘tabularx’, ‘tabulary’, ‘array’, ‘align’, ...) are indented in a nicer and more informative way when the column values of a table line are written across multiple lines in the tex file.

• The suitable number of ampersands are inserted when you insert ‘array’, ‘tabular’ and ‘tabular*’ environments with C-c C-e. Similar experience is obtained if you terminate rows in these environments with C-c LFD. It supplies line break macro ‘\\’ and inserts the suitable number of ampersands on the next line.

Similar supports are provided for various ‘amsmath’ environments. See Section 2.4.4 [Tabular-like], page 30, for details.

• Commands for narrowing to a group (\TeX-narrow-to-group) and to \LaTeX environments (\LaTeX-narrow-to-environment) were added.

• Now arbitrary options can be passed to the \TeX processor on a per file basis using the \TeX-command-extra-options option. See Section 4.1.3 [Processor Options], page 59, for details.

• Now C-c C-e document RET, in an empty document, prompts for ‘\usepackage’ macros in addition to ‘\documentclass’.
• **`TeX-add-style-hook`** has now a third argument to tell AUCTeX for which dialect (LaTeX, Texinfo or BibTeX) the style hook is registers. Labelling style hook by dialect will avoid applying them not in the right context.

• There have been lots of bug fixes and feature additions.

**News in 11.87**

• AUCTeX now supports Biber in conjunction with biblatex in addition to BibTeX.

• Each AUCTeX mode now has its own abbrev table. On Emacs, which provide the possibility to inherit abbrevs from other tables, the abbrevs from the Text mode abbrev table are available as well. Newly defined abbrevs are written to the mode-specific tables, though.

• The file ‘`tex-fptex.el`’ was removed.

• Forward/backward search for Evince has been improved. If Emacs is compiled with DBUS support and a recent Evince version (3.x) is installed, the communication goes over the desktop bus instead of the command line, resulting in more accurate positioning of point in Emacs and highlighting of the target paragraph in Evince.

• A problem where Ghostscript threw an ‘/invalidfileaccess’ error when running `preview-latex` was fixed.

• A lot of smaller fixes and additions have been made.

**News in 11.86**

• Parsing of LaTeX output was improved. It is now less likely that AUCTeX opens a non-existent file upon calling `TeX-next-error`; a problem for example encountered when using MiKTeX 2.8. In addition quoted file names as emitted by MiKTeX are now supported.

• A new framework for the definition and selection of viewers was implemented. If you have customizations regarding viewers you will have to redo them in this new framework or reenable the old one. See Section 4.2.1 [Starting Viewers], page 62, for details.

• Comprehensive editing support for PSTricks was added.

• Support for various LaTeX packages was added, e.g. ‘`tabularx`’, ‘`CJK`’, and ‘`hyperref`’.

• An easy way to switch between TeX engines (PDFTeX, LuaTeX, XeLaTeX, Omega) was added.

• Support for SyncTeX was added. This involves the command line options for LaTeX and the viewer.

• Folding can now be customized to use macro arguments as replacement text.

• `preview.sty` now works with XeLaTeX.

• A lot of smaller and larger bugs have been squashed.

**News in 11.85**

• Font locking has been improved significantly. It is now less prone to color bleeding which could lead to high resource usage. In addition it now includes information about LaTeX macro syntax and can indicate syntactically incorrect macros in LaTeX mode.
• The license was updated to GPLv3.
• Support for the nomencl, flashcards and comment \LaTeX{} packages as well as the Icelandic language option of babel were added.
• Support for folding of math macros was added.
• Lots of minor bugs in features and documentation fixed.

**News in 11.84**

• There have been problems with the `-without-texmf-dir` option to `configure` when the value of `-with-kpathsea-sep` was set or determined for an installation system with a default different from that of the runtime system. `with-kpathsea-sep` has been removed; the setting is now usually determined at runtime.

Due to this and other problems, `preview-latex` in the released XEmacs package failed under Windows or with anything except recent 21.5 XEmacsen.
• AUCTeX and `preview-latex` have been changed in order to accommodate file names containing spaces. `preview-latex` now tolerates bad PostScript code polluting the stack (like some Omega fonts).
• ‘`preview.sty`’ had in some cases failed to emit PostScript header specials.
• Support for folding of comments was added.
• The `polish` language option of the babel \LaTeX{} package as well as the polski \LaTeX{} package are now supported. Most notably this means that AUCTeX will help to insert quotation marks as defined by `polish.sty` (\texttt{"..."}) and `polski.sty` (\texttt{,...'}).
• The \TeX{} tool bar is now available and enabled by default in plain \TeX{} mode. See Section 1.3.2 [Processing Facilities], page 18.
• Bug fix in the display of math subscripts and superscripts.
• Bug fix TeX-doc for Emacs 21.
• There has been quite a number of other bug fixes to various features and documentation across the board.

**News in 11.83**

• The new function `TeX-doc` provides easy access to documentation about commands and packages or information related to \TeX{} and friends in general. See Section 4.7 [Documentation], page 70.
• You can now get rid of generated intermediate and output files by means of the new ‘Clean’ and ‘Clean All’ entries in `TeX-command-list` accessible with `C-c C-c` or the Command menu. See Section 4.6 [Cleaning], page 69.
• Support for forward search with PDF files was added. That means you can jump to a place in the output file corresponding to the position in the source file. See Section 4.2 [Viewing], page 62.

Adding support for this feature required the default value of the variable `TeX-output-view-style` to be changed. Please make sure you either remove any customizations overriding the new default or incorporate the changes into your customizations if you want to use this feature.
• Tex error messages of the -file-line-error kind are now understood in AUCTeX and preview-latex (parsers are still separate).
• Bug fix in XyMTeX support.
• The \LaTeX tool bar is now enabled by default. See Section 1.3.2 [Processing Facilities], page 18.

News in 11.82
• Support for the MinionPro \LaTeX package was added.
• Warnings and underfull/overfull boxes are now being indicated in the echo area after a \LaTeX run, if the respective debugging options are activated with \TeX-toggle-debug-warnings (C-c C-t C-w) or \TeX-toggle-debug-bad-boxes (C-c C-t C-b). In this case \TeX-next-error will find these warnings in addition to normal errors.

The key binding C-c C-w for \TeX-toggle-debug-bad-boxes (which was renamed from \TeX-toggle-debug-boxes) now is deprecated.
• AUCTeX now can automatically insert a pair of braces after typing _ or ^ in math constructs if the new variable \TeX-electric-sub-and-superscript is set to a non-nil value.
• Some language-specific support for French was added. There now is completion support for the commands provided by the ‘frenchb’ (and ‘francais’) options of the babel \LaTeX package and easier input of French quotation marks (\og ... \fg) which can now be inserted by typing ".
• Completion support for options of some \LaTeX packages was added.
• Already in version 11.81 the way to activate AUCTeX changed substantially. This should now be done with (load "auctex.el" nil t t) instead of the former (require 'tex-site). Related to this change tex-mik.el does not load tex-site.el anymore. That means if you used only (require 'tex-mik) in order to activate AUCTeX, you have to add (load "auctex.el" nil t t) before the latter statement. See Section 1.2.4 [Loading the package], page 7.
• Handling of verbatim constructs was consolidated across AUCTeX. This resulted in the font-latex-specific variables font-latex-verb-like-commands, font-latex-verbatim-macros, and font-latex-verbatim-environments being removed and the more general variables LaTeX-verbatim-macros-with-delims, LaTeX-verbatim-macros-with-braces, and LaTeX-verbatim-environments being added.
• The output of a BibTeX run is now checked for warnings and errors, which are reported in the echo area.
• The aliases for font-latex-title-fontify were removed. Use font-latex-fontify-sectioning instead.
• The problem that Japanese macros where broken across lines was fixed.
• Various bug fixes.

News in 11.81
• LaTeX-mark-section now marks subsections of a given section as well. The former behavior is available via the prefix argument.
• *preview-latex* which was previously available separately became a subsystem of AUCTeX. There is no documented provision for building or installing *preview-latex* separately. It is still possible to use and install AUCTeX without *preview-latex*, however.

• The installation procedures have been overhauled and now also install startup files as part of the process (those had to be copied manually previously). You are advised to remove previous installations of AUCTeX and *preview-latex* before starting the installation procedure. A standard installation from an unmodified tarball no longer requires Makeinfo or Perl.

Also note that the way AUCTeX is supposed to be activated changed. Instead of

```latex
(require 'tex-site)
```

you should now use

```latex
(load "auctex.el" nil t t).
```

While the former method may still work, the new method has the advantage that you can deactivate a preactivated AUCTeX with the statement

```latex
(unload-feature 'tex-site)
```

before any of its modes have been used. This may be important especially for site-wide installations.

• Support for the babel LaTEX package was added.

• Folding a buffer now ensures that the whole buffer is fontified before the actual folding is carried out. If this results in unbearably long execution times, you can fall back to the old behavior of relying on stealth font locking to do this job in the background by customizing the variable TeX-fold-force-fontify.

• Folded content now reveals part of its original text in a tooltip or the echo area when hovering with the mouse pointer over it.

• The language-specific insertion of quotation marks was generalized. The variables LaTeX-german-open-quote, LaTeX-german-close-quote, LaTeX-german-quote-after-quote, LaTeX-italian-open-quote, LaTeX-italian-close-quote, and LaTeX-italian-quote-after-quote are now obsolete. If you are not satisfied with the default settings, you should customize TeX-quote-language-alist instead.

• Similar to language-specific quote insertion, AUCTeX now helps you with hyphens in different languages as well. See Section 5.4.1 [European], page 75, for details.

• Fill problems in Japanese text introduced in AUCTeX 11.55 were fixed. AUCTeX tries not to break lines between 1-byte and 2-byte chars. These features will work in Chinese text, too.

• The scaling factor of the fontification of sectioning commands can now be customized using the variable font-latex-fontify-sectioning. This variable was previously called font-latex-title-fontify-sectioning. In this release we provide an alias but this will disappear in one of the the next releases. The faces for the sectioning commands are now called font-latex-sectioning-N-face (N=0...5) instead of font-latex-title-N-face (N=1...4). Analogously the names of the variables holding the related keyword lists were changed from font-latex-title-N-keywords to font-latex-sectioning-N-keywords. See Section 3.1 [Font Locking], page 42, for details. Make sure to adjust your customizations.

• Titles in beamer slides marked by the “\frametitle” command are know displayed with the new face font-latex-slide-title-face. You can add macros to be highlighted with this face to font-latex-match-slide-title-keywords.

• Of course a lot of bugs have been fixed.


News in 11.55

- A bug was fixed which lead to the insertion of trailing whitespace during filling. In particular extra spaces were added to sentence endings at the end of lines. You can make this whitespace visible by setting the variable `show-trailing-whitespace` to `t`. If you want to delete all trailing whitespace in a buffer, type `M-x delete-trailing-whitespace RET`.
- A bug was fixed which lead to a '*Compile-Log*' buffer popping up when the first \LaTeX{} file was loaded in an Emacs session.
- On some systems the presence of an outdated Emacspeak package lead to the error message `File mode specification error: (error "Variable binding depth exceeds max-specpdl-size")`. Precautions were added which prevent this error from happening. But nevertheless, it is advised to upgrade or uninstall the outdated Emacspeak package.
- The value of `TeX-macro-global` is not determined during configuration anymore but at load time of AUCTeX. Consequently the associated configuration option `--with-tex-input-dirs` was removed.
- Support for the \LaTeX{} Japanese classes 'jsarticle' and 'jsbook' was added.

News in 11.54

- The parser (used e.g. for `TeX-auto-generate-global`) was extended to recognize keywords common in \LaTeX{} packages and classes, like "\DeclareRobustCommand" or "\RequirePackage". Additionally a bug was fixed which led to duplicate entries in AUCTeX style files.
- Folding can now be done for paragraphs and regions besides single constructs and the whole buffer. With the new `TeX-fold-dwim` command content can both be hidden and shown with a single key binding. In course of these changes new key bindings for unfolding commands where introduced. The old bindings are still present but will be phased out in future releases.
- Info files of the manual now have a .info extension.
- There is an experimental tool bar support now. It is not activated by default. If you want to use it, add
  
  ```lisp
  (add-hook 'LaTeX-mode-hook 'LaTeX-install-toolbar)
  ```
  
to your init file.
- The manual now contains a new chapter “Quick Start”. It explains the main features and how to use them, and should be enough for a new user to start using AUCTeX.
- A new section “Font Locking” was added to the manual which explains syntax highlighting in AUCTeX and its customization. Together with the sections related to folding and outlining, the section is part of the new chapter “Display”.
- Keywords for syntax highlighting of \LaTeX{} constructs to be typeset in bold, italic or typewriter fonts may now be customized. Besides the built-in classes, new keyword classes may be added by customizing the variable `font-latex-user-keyword-classes`. The customization options can be found in the customization group `font-latex-keywords`. 
• Verbatim content is now displayed with the ‘fixed-pitch’ face. (GNU Emacs only)
• Syntax highlighting should not spill out of verbatim content anymore. (GNU Emacs only)
• Verbatim commands like ‘\verb|...|’ will not be broken anymore during filling.
• You can customize the completion for graphic files with LaTeX-includegraphics-read-file.
• Support for the \LaTeX\ packages ‘url’, ‘listings’, ‘jurabib’ and ‘csquotes’ was added with regard to command completion and syntax highlighting.
• Performance of fontification and filling was improved.
• Insertion of nodes in Texinfo mode now supports completion of existing node names.
• Setting the variable LaTeX-float to nil now means that you will not be prompted for the float position of figures and tables. You can get the old behaviour of nil by setting the variable to "", i.e. an empty string. See also Section 2.4.2 [Floats], page 29.
• The XEmacs-specific bug concerning overlays-at was fixed.
• Lots of bug fixes.

News in 11.53
• The \LaTeX\ math menu can include Unicode characters if your Emacs built supports it. See the variable LaTeX-math-menu-unicode, Section 2.5 [Mathematics], page 30.
• Bug fixes for XEmacs.
• Completion for graphic files in the T\TeX\ search path has been added.
• start is used for the viewer for MiK\TeX\ and fp\TeX\.
• The variable TeX-fold-preserve-comments can now be customized to deactivate folding in comments.

News in 11.52
• Installation and menus under XEmacs work again (maybe for the first time).
• Fontification of subscripts and superscripts is now disabled when the fontification engine is not able to support it properly.
• Bug fixes in the build process.

News in 11.51
• PDF\TeX\ and Source Special support did not work with Con\TeX\t, this has been fixed. Similar for Source Special support under Windows.
• Omega support has been added.
• Bug fixes in the build process.
• TeX-fold now supports folding of environments in Texinfo mode.
News in 11.50

- The use of source specials when processing or viewing the document can now be controlled with the new `TeX-source-specials` minor mode which can be toggled via an entry in the Command menu or the key binding `C-c C-t C-s`. If you have customized the variable `TeX-command-list`, you have to re-initialize it for this to work. This means to open a customization buffer for the variable by typing `M-x customize-variable RET TeX-command-list RET`, selecting “Erase Customization” and do your customization again with the new default.

- The content of the command menu now depends on the mode (plain TeX, LaTeX, ConTeXt etc.). Any former customization of the variable `TeX-command-list` has to be erased. Otherwise the command menu and the customization will not work correctly.

- Support for hiding and auto-revealing macros, e.g. footnotes or citations, and environments in a buffer was added, Section 3.2 [Folding], page 49.

- You can now control if indentation is done upon typing RET by customizing the variable `TeX-newline-function`, Section 2.9 [Indenting], page 36.

- Limited support for `doc.sty` and `ltxdoc.cls` (‘dtx’ files) was added. The new `docTeX` mode provides functionality for editing documentation parts. This includes formatting (indenting and filling), adding and completion of macros and environments while staying in comments as well as syntax highlighting. (Please note that the mode is not finished yet. For example syntax highlighting does not work yet in XEmacs.)

- For macro completion in `docTeX` mode the AUCTeX style files `doc.el`, `ltxdoc.el` and `ltx-base.el` were included. The latter provides general support for low-level LaTeX macros and may be used with LaTeX class and style files as well. It is currently not loaded automatically for those files.

- Support for ConTeXt with a separate ConTeXt mode is now included. Macro definitions for completion are available in Dutch and English.

- The filling and indentation code was overhauled and is now able to format commented parts of the source syntactically correct. Newly available functionality and customization options are explained in the manual.

- Filling and indentation in XEmacs with `preview-latex` and activated previews lead to the insertion of whitespace before multi-line previews. AUCTeX now contains facilities to prevent this problem.

- If `TeX-master` is set to `t`, AUCTeX will now query for a master file only when a new file is opened. Existing files will be left alone. The new function `TeX-master-file-ask` (bound to `C-c _`) is provided for adding the variable manually.

- Sectioning commands are now shown in a larger font on display devices which support such fontification. The variable `font-latex-title-fontify` can be customized to restore the old appearance, i.e. the usage of a different color instead of a change in size.

- Support for `alphanum.sty`, `beamer.cls`, `booktabs.sty`, `captcont.sty`, `emp.sty`, `paralist.sty`, `subfigure.sty` and `units.sty/nicefrac.sty` was added. Credits go to the authors mentioned in the respective AUCTeX style files.

- Inserting graphics with `C-c RET` `includegraphics` RET was improved. See the variable `LaTeX-includegraphics-options-alist`. 

---
• If \texttt{LaTeX-default-position} is \texttt{nil}, don’t prompt for position arguments in Tabular-like environments, see Section 2.4.4 [Tabular-like], page 30.

• Completion for available packages when using \texttt{C-c RET \texttt{usepackage RET}} was improved on systems using the kpathsea library.

• The commenting functionality was fixed. The separate functions for commenting and uncommenting were unified in one function for paragraphs and regions respectively which do both.

• Syntax highlighting can be customized to fontify quotes delimited by either \texttt{\textgreater \textgreater German} or \texttt{\textless \textless French\textgreater \textgreater} quotation marks by changing the variable \texttt{font-latex-quotes}.

• Certain \LaTeX/\tex packages for functions, references, variables and warnings will now be fontified specially. You may add your own keywords by customizing the variables \texttt{font-latex-match-function-keywords}, \texttt{font-latex-match-reference-keywords}, \texttt{font-latex-match-variable-keywords} and \texttt{font-latex-match-warning-keywords}.

• If you include the style files \texttt{german} or \texttt{ngerman} in a document (directly or via the ‘\texttt{babel}’ package), you should now customize \LaTeX\texttt{-german-open-quote}, \LaTeX\texttt{-german-close-quote} and \LaTeX\texttt{-german-quote-after-quote} instead of \TeX\texttt{-open-quote}, \TeX\texttt{-close-quote} and \TeX\texttt{-quote-after-quote} if you want to influence the type of quote insertion.

• Upon viewing an output file, the right viewer and command line options for it are now determined automatically by looking at the extension of the output file and certain options used in the source file. The behavior can be adapted or extended respectively by customizing the variable \texttt{TeX-output-view-style}.

• You can control whether \LaTeX\texttt{-insert-macro} (\texttt{C-c RET}) ask for all optional arguments by customizing the variable \texttt{TeX-insert-macro-default-style}, Section 2.6 [Completion], page 32.

• \LaTeX\texttt{-run-discard} is now able to completely detach a process that it started.

• The build process was enhanced and is now based on \texttt{autoconf} making installing AUCTeX a mostly automatic process. See Section 1.2 [Installation], page 4, and Section 1.2.7 [Installation under MS Windows], page 10, for details.

News in 11.14

• Many more \LaTeX and \LaTeXe commands are supported. Done by Masayuki Ataka ataka@milk.freemail.ne.jp

News in 11.12

• Support for the KOMA-Script classes. Contributed by Mark Trettin Mark.Trettin@gmx.de.

News in 11.11

• Support for \texttt{prosper.sty}, see \url{http://prosper.sourceforge.net/}. Contributed by Phillip Lord p.lord@russet.org.uk.
News in 11.10

- `comment-region` now inserts `%%` by default. Suggested by "Davide G. M. Salvetti"
salve@debian.org>.

News in 11.06

- You can now switch between using the `font-latex` (all emacsen), the `tex-font` (Emacs
  21 only) or no special package for font locking. Customize `TeX-install-font-lock`
  for this.

News in 11.04

- Now use `-t landscape` by default when landscape option appears. Suggested by Erik
  Frisk frisk@isy.liu.se.

News in 11.03

- Use `tex-fptex.el` for fp\TeX support. Contributed by Fabrice Popineau
  Fabrice.Popineau@supelec.fr.

News in 11.02

- New user option `LaTeX-top-caption-list` specifies environments where the caption
  should go at top. Contributed by ataka@milk.freemail.ne.jp (Masayuki Ataka).
- Allow explicit dimensions in `graphicx.sty`. Contributed by
  ataka@milk.freemail.ne.jp (Masayuki Ataka).
- Limited support for `verbatim.sty`. Contributed by ataka@milk.freemail.ne.jp
  (Masayuki Ataka).
- Better support for `amsmath` items. Patch by ataka@milk.freemail.ne.jp (Masayuki
  Ataka).
- More accurate error parsing. Added by David Kastrup David.Kastrup@t-online.de.

News in 11.01

- Bug fixes.

Older versions

See the file `history.texi` for older changes.

A.3 Future Development

The following sections describe future development of AUCTeX. Besides mid-term goals,
bug reports and requests we cannot fix or honor right away are being gathered here. If you
have some time for Emacs Lisp hacking, you are encouraged to try to provide a solution
to one of the following problems. If you don’t know Lisp, you may help us to improve the
documentation. It might be a good idea to discuss proposed changes on the mailing list of
AUCTeX first.
A.3.1 Mid-term Goals

- **Integration of preview-latex into AUCTeX**
  
  As of AUCTeX 11.81 `preview-latex` is a part of AUCTeX in the sense that the installation routines were merged and `preview-latex` is being packaged with AUCTeX.

  Further integration will happen at the backend. This involves folding of error parsing and task management of both packages which will ease development efforts and avoid redundant work.

- **Error help catalogs**
  
  Currently, the help for errors is more or less hardwired into `latex.el`. For supporting error help in other languages, it would be sensible to instead arrange error messages in language-specific files, make a common info file from all such catalogs in a given language and look the error texts up in an appropriate index. The user would then specify a preference list of languages, and the errors would be looked up in the catalogs in sequence until they were identified.

- **Combining ‘docTeX’ with RefTeX**
  
  Macro cross references should also be usable for document navigation using RefTeX.

- **Fix remove-style feature**
  
  Currently TeX-remove-style implementation isn’t good. It is common practice that major mode functions directly add macros and environments via `TeX-add-symbols` and `LaTeX-add-environments`, but those macros and environments are lost once `TeX-remove-style` runs. It is necessary to run major mode function, by e.g. `normal-mode`, again to recover them, but that makes no point in running `TeX-remove-style` itself because major mode function kills all buffer-local variables.

  As of AUCTeX 12.3, `TeX-remove-style` is no longer used by any other codes.

- **Factor out syntax propertization from font-latex.el**
  
  Syntax propertization is implemented in `font-latex.el`. This means that features which depend on syntax parse don’t work well for `tex-font.el` users and those who disable font lock.

  Hence syntax propertization should be factored out from `font-latex.el` and implemented as a major mode facility.

  (Texinfo mode is an exception because it already has its own syntax propertize function, which just copies the one available in Emacs built-in texinfo mode.)

- **Add documentation**
  
  Following entries should be included in the document:
  
  - Variables `LaTeX-insert-into-comments`, `TeX-translate-location-hook`
  - How to use `TeX-auto-add-type`, as well as functions and variables generated by that macro. They should be covered in the node Section 5.6.5 [Hacking the Parser], page 92.
  - Usage of ConTeXt mode
A.3.2 Wishlist

- Enable syntactic font lock for verbatim constructs in ‘docTeX’ mode
  In ‘docTeX’ mode buffer, ‘%’ sign at the line beginning hinders syntactic font lock of verbatim constructs. This should be improved.

- Simplify tool bar implementation
  The library `toolbar-x.el` was developed as an abstraction layer to absorb difference between XEmacs and GNU Emacs. Now that XEmacs is no longer supported, the library, together with `tex-bar.el` as a whole, can be much simplified (or even unified).

- Documentation lookup for macros
  A parser could gather information about which macros are defined in which \LaTeX\ packages and store the information in a hashtable which can be used in a backend for `TeX-doc` in order to open the matching documentation for a given macro. The information could also be used to insert an appropriate `\usepackage` statement if the user tries to insert a macro for which the respective package has not been requested yet.

- Improvements to error reporting
  Fringe indicators for errors in the main text would be nice.

- A math entry grid
  A separate frame with a table of math character graphics to click on in order to insert the respective sequence into the buffer (cf. the “grid” of `x-symbol`).

- Crossreferencing support
  It would be nice if you could index process your favorite collection of `.dtx` files (such as the \LaTeX\ source), just call a command on arbitrary control sequence, and get either the DVI viewer opened right at the definition of that macro (using Source Specials), or the source code of the `.dtx` file.

- Better plain \TeX\ support
  For starters, `LaTeX-math-mode` is not very \LaTeX\-specific in the first place, and similar holds for indentation and formatting.

- Page count when compiling should (optionally) go to modeline of the window where the compilation command was invoked, instead of the output window. Suggested by Karsten Timnefeld `tinnefeld@irb.informatik.uni-dortmund.de`.

- Command to insert a macrodefinition in the preamble, without moving point from the current location. Suggested by "Jeffrey C. Ely" `ely@nwu.edu`.

- A database of all commands defined in all stylefiles. When a command or environment gets entered that is provided in one of the styles, insert the appropriate `\usepackage` in the preamble.

- A way to add and overwrite math mode entries in style files, and to decide where they should be. Suggested by Remo Badii `Remo.Badii@psi.ch`.

- Create template for (first) line of tabular environment.

- I think prompting for the master is the intended behaviour. It corresponds to a ‘shared’ value for `Tex-Master`.
  There should probably be a ‘none’ value which wouldn’t query for the master, but instead disable all features that relies on `TeX-master`. 
This default value for TeX-master could then be controlled with mapping based on the extension.

- Use index files (when available) to speed up C-c C-m include RET.
- Option not to calculate very slow completions like for C-c C-m include RET.
- Font menu should be created from TeX-font-list.
- Installation procedure written purely in emacs lisp.
- Included PostScript files should also be counted as part of the document.
- A nice hierarchical by-topic organization of all officially documented \LaTeX macros, available from the menu bar.
- TeX-command-default should be set from the master file, if not set locally. Suggested by Peter Whaite peta@cim.mcgill.ca.
- Make AUCTeX work with ‘crypt++’. Suggested by Chris Moore Chris.Moore@src.bae.co.uk.
- Make AUCTeX work with ‘longlines’. This would also apply to preview-latex, though it might make sense to unify error processing before attempting this.
- The ‘Spell’ command should apply to all files in a document. Maybe it could try to restrict to files that have been modified since last spell check? Suggested by Ravinder Bhumbla rbhumbla@ucsd.edu.
- Make . check for abbreviations and sentences ending with capital letters.
- Use Emacs 19 minibuffer history to choose between previewers, and other stuff. Suggested by John Interrante interran@uluru.Stanford.EDU.
- Documentation of variables that can be set in a style hook.

We need a list of what can safely be done in an ordinary style hook. You can not set a variable that AUCTeX depends on, unless AUCTeX knows that it has to run the style hooks first.

Here is the start of such a list.

\LaTeX-add-environments
TeX-add-symbols
LaTeX-add-labels
LaTeX-add-bibliographies
LaTeX-largest-level
- Outline should be (better) supported in \TeX mode.
  At least, support headers, trailers, as well as TeX-outline-extra.
- TeX-header-start and TeX-trailer-end.
  We might want these, just for fun (and outlines)
- Plain \TeX and \LaTeX specific header and trailer expressions.
  We should have a way to globally specify the default value of the header and trailer regexps.
- Get closer to original TeX-mode keybindings.
  A third initialization file (tex-mode.el) containing an emulator of the standard TeX-mode would help convince some people to change to AUCTeX.
• Use markers in \texttt{TeX-error-list} to remember buffer positions in order to be more robust with regard to line numbers and changed files.

• Finish the Texinfo mode. For one thing, many Texinfo mode commands do not accept braces around their arguments.

• Hook up the letter environment with \texttt{bbdb.el}.

A.3.3 Bugs

• The style hooks automatically generated by parsing files for \texttt{example.dtx, example.sty, example.drv} and \texttt{example.bib} all clash. Bad. Clash with hand-written style hooks should be removed by dialect discrimination — to be checked.

• \texttt{C-c \`} should always stay in the current window, also when it finds a new file.

• Do not overwrite emacs warnings about existing auto-save files when loading a new file.

• Maybe the regexp for matching a \LaTeX{} symbol during parsing should be "$/([a-zA-Z]+\|./)"$ — thiemann@informatik.uni-tuebingen.de Peter Thiemann.

• \texttt{AUCTeX} should not parse verbatim environments.

• Make '\`' check for math context in \texttt{LaTeX-math-mode} and simply self insert if not in a math context.

• Make \texttt{TeX-insert-dollar} more robust. Currently it can be fooled by '\texttt{\mbox}'es and escaped double dollar for example.

• Correct indentation for tabbing, table, and math environments.

A.4 Frequently Asked Questions

1. Something is not working correctly. What should I do?

   Well, you might have guessed it, the first place to look is in the available documentation packaged with \texttt{AUCTeX}. This could be the release notes (in the \texttt{RELEASE} file) or the news section of the manual in case you are experiencing problems after an upgrade, the \texttt{INSTALL} file in case you are having problems with the installation, the section about bugs in the manual in case you encountered a bug or the relevant sections in the manual for other related problems.

   If this did not help, you can send a bug report to the \texttt{AUCTeX} bug reporting list by using the command \texttt{M-x TeX-submit-bug-report RET}. But before you do this, you can try to get more information about the problem at hand which might also help you locate the cause of the error yourself.

   First, you can try to generate a so-called backtrace which shows the functions involved in a program error. In order to do this, start Emacs with the command line ‘\texttt{emacs --debug-init}’ and/or put the line

   
   (setq debug-on-error t)

   as the first line into your init file. After Emacs has started, you can load a file which triggers the error and a new window should pop up showing the backtrace. If you get such a backtrace, please include it in the bug report.
Second, you can try to figure out if something in your personal or site configuration triggers the error by starting Emacs without such customizations. You can do this by invoking Emacs with the following command line, depending on the installation scheme of AUCTeX and your OS:

- If you installed AUCTeX from ELPA, use `emacs -q -no-site-file --eval "(progn (setq package-load-list '((auctex t)))
  (package-initialize))"`. The `--eval` option activates only AUCTeX among all installed ELPA packages.
- If you installed AUCTeX via traditional `configure-make` scheme, use `emacs -q -no-site-file -l auctex`. The `-l` option loads `auctex.el` which you normally do in your init file.
- In both above cases, use `runemacs` instead of `emacs` on windows.

After you have started Emacs like this, you can load the file triggering the error. If everything is working now, you know that you have to search either in the site configuration file or your personal init file for statements related to the problem.

2. What versions of Emacs are supported?

AUCTeX was tested with GNU Emacs 26.1. Older versions may work but are unsupported.

3. What should I do when `./configure` does not find programs like `latex`?

This is problem often encountered on Windows. Make sure that the `PATH` environment variable includes the directories containing the relevant programs, as described in Section “Installation under MS Windows” in the AUCTeX manual.

4. Why doesn’t the completion, style file, or multifile stuff work?

It must be enabled first, insert this in your init file:

```lisp
(setq-default TeX-master nil)
(setq TeX-parse-self t)
(setq TeX-auto-save t)
```

Read also the chapters about parsing and multifile documents in the manual. See Section 5.3 [Parsing Files], page 73, and Section 5.2 [Multifile], page 71.

5. Why doesn’t `TeX-save-document` work?

`TeX-check-path` has to contain "./" somewhere.

6. Why is the information in `foo.tex` forgotten when I save `foo.bib`?

For various reasons, AUCTeX ignores the extension when it stores information about a file, so you should use unique base names for your files. E.g. rename `foo.bib` to `foob.bib`.

7. Why doesn’t AUCTeX signal when processing a document is done?

If the message in the minibuffer stays "Type ‘C-c C-l’ to display results of compilation.", you probably have a misconfiguration in your init file (.emacs, init.el or similar). To track this down either search in the ‘*Messages*’ buffer for an error message or put `(setq debug-on-error t)` as the first line into your init file, restart Emacs and open a \LaTeX\ file. Emacs will complain loudly by opening a debugging buffer as soon as an error occurs. The information in the debugging buffer can help you find the cause of the error in your init file.
8. Why does \texttt{TeX-next-error (C-c `)} fail?

If \texttt{TeX-file-line-error} is set to \texttt{nil} (not the default), these sort of failures might be related to the the fact that when writing the log file, \TeX puts information related to a file, including error messages, between a pair of parentheses. In this scenario AUCTeX determines the file where the error happened by parsing the log file and counting the parentheses. This can fail when there are other, unbalanced parentheses present.

Activating so-called ‘file:line:error’ messages for the log file usually solves this issue, as these kind of messages are easier to parse; however, they may lack some details. Activation can be done either in the configuration of your \TeX system (consult its manual to see where this is) or by simply keeping the variable \texttt{TeX-file-line-error} to the default value of \texttt{non-nil}.

9. What does ‘AUC’ stand for?

AUCTeX came into being at Aalborg University in Denmark. Back then the Danish name of the university was Aalborg Universitetscenter; ‘AUC’ for short.

A.5 Features specific to AUCTeX’s Texinfo major mode

AUCTeX includes a major mode for editing Texinfo files. This major mode is not the same mode as the native Texinfo mode (see Section “Texinfo Mode” in Texinfo) of Emacs, although they have the same name. However, AUCTeX still relies on a number of functions from the native Texinfo mode.

The following text describes which functionality is offered by AUCTeX and which by the native Texinfo mode. This should enable you to decide when to consult the AUCTeX manual and when the manual of the native mode. And in case you are a seasoned user of the native mode, the information should help you to swiftly get to know the AUCTeX-specific commands.

A.5.1 How AUCTeX and the native mode work together

In a nutshell the split between AUCTeX Texinfo mode, and native Texinfo mode is as follows:

- Most of the editing (environment creation, commenting, font command insertions) and/or processing commands (e.g. compiling or printing) which are available in other AUCTeX modes are also handled by AUCTeX in Texinfo mode.
- Texinfo-related features (e.g. info node linkage or menu creation) rely on the commands provided by the native Texinfo mode. AUCTeX provides the key bindings to reach these functions, keeping the same keys as in native Texinfo whenever possible, or similar ones otherwise.

A.5.2 Where the native mode is superseded

This section is directed to users of the native Texinfo mode switching to AUCTeX. It follows the summary of the native mode (see Section “Texinfo Mode Summary” in Texinfo) and lists which of its commands are no longer of use.

Insert commands

In the native Texinfo mode, frequently used Texinfo commands can be inserted with key bindings of the form \texttt{C-c C-c k} where \texttt{k} differs for each Texinfo command; \texttt{c} inserts \texttt{@code}, \texttt{d} inserts \texttt{@dfn}, \texttt{k} \texttt{@kbd}, etc.
In AUCTeX commands are inserted with the key binding \texttt{C-c C-m} instead which prompts for the macro to be inserted. For font selection commands (like \texttt{@b}, \texttt{@i}, or \texttt{@emph}) and a few related ones (like \texttt{@var}, \texttt{@key} or \texttt{@code}) there are bindings which insert the respective macros directly. They have the form \texttt{C-c C-f k} or \texttt{C-c C-f C-k} and call the function \texttt{TeX-font}. Type \texttt{C-c C-f} \texttt{RET} to get a list of supported commands.

Note that the prefix argument is not handled the same way by AUCTeX.

Insert braces

In AUCTeX braces can be inserted with the same key binding as in the native Texinfo mode: \texttt{C-c \{}. But AUCTeX uses its own function for the feature: \texttt{TeX-insert-braces}.

Insert environments

The native Texinfo mode does not insert full environments. Instead, it provides the function \texttt{texinfo-insert-@end} (mapped to \texttt{C-c C-c e}) for closing an open environment with a matching @end statement.

In AUCTeX you can insert full environments, i.e. both the opening and closing statements, with the function \texttt{TeXinfo-environment} (mapped to \texttt{C-c C-e}).

Insert nodes

Node insertion command \texttt{texinfo-insert-@node} is available in the native Texinfo mode (mapped to \texttt{C-c C-c n}). It only inserts the string ‘@node’ (with suitable newlines).

AUCTeX provides its own node insertion command \texttt{Texinfo-insert-node} (mapped to \texttt{C-c C-s}), which asks for the next, previous and upper nodes with completion, in addition to the node name you are going to insert.

Format info files with \texttt{makeinfo} and \texttt{TeX}

In the native Texinfo mode there are various functions and bindings to format a region or the whole buffer for info or to typeset the respective text. For example, there is \texttt{makeinfo-buffer} (mapped to \texttt{C-c C-m C-b}) which runs makeinfo on the buffer or there is \texttt{texinfo-tex-buffer} (mapped to \texttt{C-c C-t C-b}) which runs \texttt{TeX} on the buffer in order to produce a DVI file.

In AUCTeX different commands for formatting or typesetting can be invoked through the function \texttt{TeX-command-master} (mapped to \texttt{C-c C-c}). After typing \texttt{C-c C-c}, you can select the desired command, e.g. ‘Makeinfo’, ‘Makeinfo HTML’, ‘Texi2dvi’ or ‘TeX’, through a prompt in the mini buffer. Note that you can make, say ‘Makeinfo’, the default by adding this statement in your init file:

\begin{verbatim}
(add-hook 'Texinfo-mode-hook
  (lambda () (setq TeX-command-default "Makeinfo"))))
\end{verbatim}

Note also that \texttt{C-c C-c Makeinfo} \texttt{RET} is not completely functionally equivalent to \texttt{makeinfo-buffer} as the latter will display the resulting info file in Emacs, showing the node corresponding to the position in the source file, just after a successful compilation. This is why, while using AUCTeX, invoking \texttt{makeinfo-buffer} might still be more convenient.

Note also that in the case of a multifile document, \texttt{C-c C-c} in AUCTeX will work on the whole document (provided that the file variable \texttt{TeX-master} is set
correctly), while `makeinfo-buffer` in the native mode will process only the current buffer, provided that the `@setfilename` statement is provided.

Produce indexes and print

The native Texinfo mode provides the binding `C-c C-t C-i` (`texinfo-texindex`) for producing an index and the bindings `C-c C-t C-p` (`texinfo-texprint`) and `C-c C-t C-q` (`tex-show-print-queue`) for printing and showing the printer queue. These are superseded by the respective commands available through `C-c C-c (TeX-command-master)` in AUCTeX: ‘Texindex’, ‘Print’, and ‘Queue’.

Kill jobs

The command `C-c C-t C-k` (`tex-kill-job`) in the native mode is superseded by `C-c C-k` (`TeX-kill-job`) in AUCTeX.

A.5.3 Where key bindings are mapped to the native mode

This node follows the native Texinfo mode summary (see Section “Texinfo Mode Summary” in Texinfo) and lists only those commands to which AUCTeX provides a keybinding.

Basically all commands of the native mode related to producing menus and interlinking nodes are mapped to same or similar keys in AUCTeX, while a few insertion commands are mapped to AUCTeX-like keys.

@item insertion

The binding `C-c C-c i` for the insertion of `@item` in the native mode is mapped to `M-RET` or `C-c C-j` in AUCTeX, similar to other AUCTeX modes.

@end insertion

The binding `C-c C-c e` for closing a `@foo` command by a corresponding `@end foo` statement in the native mode is mapped to `C-c J` in AUCTeX, similar to other AUCTeX modes.

Move out of balanced braces

The binding `C-c \}` (`up-list`) is available both in the native mode and in AUCTeX. (This is because the command is not implemented in either mode but a native Emacs command.) However, in AUCTeX, you cannot use `C-c J` for this, as it is used for `@end` insertion.

Update pointers

The bindings `C-c C-u C-n` (`texinfo-update-node`) and `C-c C-u C-e` (`texinfo-every-node-update`) from the native mode are available in AUCTeX as well.

Update menus

The bindings `C-c C-u m` (`texinfo-master-menu`), `C-c C-u C-m` (`texinfo-make-menu`), and `C-c C-u C-a` (`texinfo-all-menus-update`) from the native mode are available in AUCTeX as well. The command `texinfo-start-menu-description`, bound to `C-c C-c C-d` in the native mode, is bound to `C-c C-u C-d` in AUCTeX instead.

A.5.4 Which native mode key bindings are missing

The following command from the native commands might still be useful when working with AUCTeX, however, it is not accessible with a key binding any longer.
Show the section structure

The command `texinfo-show-structure (C-c C-s)` from the native mode does not have a key binding in AUCTeX. The binding is used by AUCTeX for inserting `@node`.
Indices

Key Index

C-c % ........................................ 36
C-c * .................................. 34, 35
C-c . .................................. 35
C-c ] .................................. 35
C-c ? .................................. 70
C-c } .................................. 28
C-c " .................................. 69
C-c $ .................................. 72
C-c ^ .................................. 66
C-c { .................................. 22
C-c ~ .................................. 30
C-c C-a ................................ 55
C-c C-b ................................ 54
C-c C-c ................................ 54
C-c C-d ................................ 73
C-c C-e ................................ 27, 128
C-c C-f ................................ 24
C-c C-f C-b ................................ 17, 23
C-c C-f C-c ................................ 17, 24
C-c C-f C-e ................................ 17, 23
C-c C-f C-f ................................ 17, 24
C-c C-f C-i ................................ 23
C-c C-f C-l ................................ 23
C-c C-f C-m ................................ 23
C-c C-f C-n ................................ 23
C-c C-f C-r ................................ 23
C-c C-f C-t ................................ 23
C-c C-f C-w ................................ 23
C-c C-f g .................................. 80
C-c C-f m .................................. 80
C-c C-k .................................. 69, 129
C-c C-l .................................. 69
C-c C-m .................................. 33
C-c C-n .................................. 73
C-c C-o b .................................. 50
C-c C-o C-b ................................ 49
C-c C-o C-c ................................ 50
C-c C-o C-e ................................ 50
C-c C-o C-f ................................ 49
C-c C-o C-m ................................ 50
C-c C-o C-o ................................ 51
C-c C-o C-p ................................ 50
C-c C-o C-r ................................ 50
C-c C-o i .................................. 51
C-c C-o p .................................. 51
C-c C-o r .................................. 51
C-c C-q C-e ................................ 40
C-c C-q C-p ................................ 40
C-c C-q C-r ................................ 40
C-c C-q C-s ................................ 40
C-c C-r .................................. 54
C-c C-s .................................. 25, 128
C-c C-t C-b ................................ 67
C-c C-t C-i ................................ 19, 59
C-c C-t C-o ................................ 19
C-c C-t C-p ................................ 18, 59
C-c C-t C-r ................................ 55
C-c C-t C-s ................................ 19, 59
C-c C-t C-w ................................ 67
C-c C-t C-x ................................ 67
C-c C-v .................................. 62
C-c C-z .................................. 54
C-c LFQ .................................. 29, 30
C-J .................................... 37
C-M-a .................................. 28
C-M-e .................................. 28
C-M-h .................................. 35
C-x n e .................................. 53
C-x n g .................................. 53
<table>
<thead>
<tr>
<th>Function Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L</strong></td>
</tr>
<tr>
<td>latex-mode</td>
</tr>
<tr>
<td>LaTeX—arguments-completion-at-point</td>
</tr>
<tr>
<td>LaTeX-add-bibliographies</td>
</tr>
<tr>
<td>LaTeX-add-environments</td>
</tr>
<tr>
<td>LaTeX-add-labels</td>
</tr>
<tr>
<td>LaTeX-arg-author</td>
</tr>
<tr>
<td>LaTeX-arg-usepackage</td>
</tr>
<tr>
<td>LaTeX-classname-class-options</td>
</tr>
<tr>
<td>LaTeX-close-environment</td>
</tr>
<tr>
<td>LaTeX-command-section</td>
</tr>
<tr>
<td>LaTeX-declare-expert-environments</td>
</tr>
<tr>
<td>LaTeX-env-args</td>
</tr>
<tr>
<td>LaTeX-env-array</td>
</tr>
<tr>
<td>LaTeX-env-bib</td>
</tr>
<tr>
<td>LaTeX-env-contents</td>
</tr>
<tr>
<td>LaTeX-env-figure</td>
</tr>
<tr>
<td>LaTeX-env-item</td>
</tr>
<tr>
<td>LaTeX-env-item-args</td>
</tr>
<tr>
<td>LaTeX-env-label</td>
</tr>
<tr>
<td>LaTeX-env-label-args</td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td>TAB</td>
</tr>
</tbody>
</table>

**Indices**

<table>
<thead>
<tr>
<th>L</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFD</td>
<td>37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M</th>
<th>66</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-g p</td>
<td>66</td>
</tr>
<tr>
<td>M-q</td>
<td>40</td>
</tr>
<tr>
<td>M-RET</td>
<td>29, 30</td>
</tr>
<tr>
<td>M-TAB</td>
<td>32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P</th>
<th>71</th>
</tr>
</thead>
<tbody>
<tr>
<td>plain-tex-mode</td>
<td>71</td>
</tr>
</tbody>
</table>
Indices 133

T
TeX-comment-or-uncomment-region 30
TeX-comment-or-uncomment-paragraph 35
TeX-command-run-all 55
TeX-comment-or-uncomment-region 35
TeX-complete-symbol 32
TeX-declare-expert-macros 88
TeX-documentation-texdoc 70
TeX-electric-macro 33
TeX-error-overview 67
TeX-fold-buffer 49
TeX-fold-clearout-buffer 50
TeX-fold-clearout-item 51
TeX-fold-clearout-paragraph 51
TeX-fold-clearout-region 50
TeX-fold-comment 50
TeX-fold-dwim 51
TeX-fold-env 50
TeX-fold-macro 50
TeX-fold-math 50
TeX-fold-mode 49
TeX-fold-paragraph 50
TeX-fold-region 50
TeX-font 24
TeX-home-buffer 69
TeX-insert-braces 22, 128
TeX-insert-dollar 21
TeX-insert-macro 33
TeX-insert-quote 20
TeX-interactive-mode 59
TeX-ispell-skip-setcar 58
TeX-ispell-skip-setcdr 58
TeX-ispell-tex-arg-end 58
TeX-kill-job 69, 129
TeX-master-file-ask 72
TeX-narrow-to-group 53
TeX-next-error 66
TeX-normal-mode 73
TeX-PDF-mode 59
TeX-pin-region 55
TeX-previous-error 66
TeX-read-hook 88
TeX-read-key-val 88
TeX-recenter-output-buffer 69
TeX-revert-document-buffer 71
TeX-safe-document 73
TeX-source-correlate-mode 59, 64
TeX-toggle-debug-bad-boxes 67
TeX-toggle-debug-warnings 67
TeX-toggle-suppress-ignored-warnings 67
TeX-view 62, 64
TeX-view-mouse 65
TeXinfo-environment 128
TeXinfo-insert-node 128
TeXinfo-mark-environment 35
TeXinfo-mark-node 35
TeXinfo-mark-section 35
texinfo-mode 71
turn-on-auto-fill 39

Variable Index
LaTeX-fold-env-spec-list
LaTeX-fold-macro-spec-list
LaTeX-font-list
LaTeX-indent-environment-check
LaTeX-indent-environment-list
LaTeX-indent-level
LaTeX-item-indent
LaTeX-item-regexp
LaTeX-label-alist
LaTeX-level
LaTeX-math-abbrev-prefix
LaTeX-math-default
LaTeX-math-list
LaTeX-math-menu-unicode
LaTeX-mode-hook
LaTeX-name
LaTeX-Omega-command
LaTeX-packagename-package-options
LaTeX-paragraph-commands
LaTeX-provided-class-options
LaTeX-provided-package-options
LaTeX-section-hook
LaTeX-section-label
LaTeX-short-caption-prompt-length
LaTeX-style-list
LaTeX-syntaxic-comments
LaTeX-table-label
LaTeX-title
LaTeX-toc
LaTeX-top-caption-list
LaTeX-verbatim-environments
LaTeX-verbatim-macros-with-braces
LaTeX-verbatim-macros-with-delims
LaTeX-fill-break-before-code-comments
LaTeX-fill-excluded-macros
LaTeX-fold-floating
LaTeX-fold-env-spec-list
LaTeX-fold-macro-spec-list
LaTeX-font-list
LaTeX-indent-environment-check
LaTeX-indent-environment-list
LaTeX-indent-level
LaTeX-item-indent
LaTeX-item-regexp
LaTeX-label-alist
LaTeX-level
LaTeX-math-abbrev-prefix
LaTeX-math-default
LaTeX-math-list
LaTeX-math-menu-unicode
LaTeX-mode-hook
LaTeX-name
LaTeX-Omega-command
LaTeX-packagename-package-options
LaTeX-paragraph-commands
LaTeX-provided-class-options
LaTeX-provided-package-options
LaTeX-section-hook
LaTeX-section-label
LaTeX-short-caption-prompt-length
LaTeX-style-list
LaTeX-syntaxic-comments
LaTeX-table-label
LaTeX-title
LaTeX-toc
LaTeX-top-caption-list
LaTeX-verbatim-environments
LaTeX-verbatim-macros-with-braces
LaTeX-verbatim-macros-with-delims

T
TeX-after-compilation-finished-functions
Tex-arg-cite-note-p
Tex-arg-input-file-search
Tex-arg-item-label-p
Tex-arg-right-insert-p
Tex-auto-cleanup-hook
Tex-auto-empty-regexp-list
Tex-auto-full-regexp-list
Tex-auto-global
Tex-auto-local
Tex-auto-parse-length
Tex-auto-prepare-hook
Tex-auto-private
Tex-auto-regexp-list
Tex-auto-save
Tex-auto-save-aggregate
Tex-auto-untabify
Tex-bar-LaTeX-button-alist
Tex-bar-LaTeX-buttons
Tex-bar-LaTeX-all-button-alist
Tex-bar-LaTeX-buttons
Tex-brace-indent-level
Tex-check-engine
Tex-check-path
Tex-check-Tex
Tex-check-Tex-command-not-found
Tex-clean-confirm
Tex-close-quote
Tex-command
Tex-command-default
Tex-command-extra-options
Tex-command-list
Tex-complete-expert-commands
Tex-complete-list
Tex-date-format
Tex-debug-bad-boxes
Tex-debug-errors
Tex-debug-warnings
Tex-default-macro
Tex-default-mode
Tex-dialect
Tex-display-help
Tex-DVI-via-PDFTex
Tex-electric-escape
Tex-electric-math
Tex-electric-sub-and-superscript
Tex-engine
Tex-engine-alist
Tex-engine-alist-builtin
Tex-error-overview-frame-parameters
Tex-error-overview-open-after-Tex-run
Tex-error-overview-setup
Tex-expand-list
Tex-file-line-error
Tex-file-recurse
Tex-fold-auto
Tex-fold-command-prefix

O
outline-regexp

P
plain-Tex-auto-regexp-list
plain-Tex-clean-intermediate-suffixes
plain-Tex-clean-output-suffixes
plain-Tex-enable-toolbar
plain-Tex-mode-hook

Indices 135
Indices 136

TeX-fold-env-spec-list ................................. 52
TeX-fold-force-fontify ................................ 49
TeX-fold-help-echo-max-length .......................... 52
TeX-fold-macro-spec-list .............................. 51
TeX-fold-math-spec-list .............................. 52
TeX-fold-preserve-comments ............................ 50
TeX-fold-type-list ....................................... 49
TeX-fold-unfold-around-mark ............................. 50
TeX-fold-unspec-env-display-string ..................... 52
TeX-fold-unspec-macro-display-string .................. 52
TeX-fold-unspec-use-name .............................. 52
TeX-font-list ............................................. 24
TeX-header-end ........................................... 54, 55
TeX-ignore-file .......................................... 81
TeX-ignore-warnings ..................................... 67
TeX-indent-close-delimiters ............................. 38
TeX-indent-open-delimiters ............................. 38
TeX-insert-braces ....................................... 33
TeX-insert-braces-alist ................................ 34
TeX-insert-macro-default-style ......................... 33
TeX-install-font-lock ................................... 42
TeX-interactive-mode .................................... 59
TeX-ispell-extend-skip-list ............................ 57
TeX-ispell-verb-delimiters ............................. 59
TeX-japanese-process-input-coding-system .............. 79
TeX-japanese-process-output-coding-system ............ 79
TeX-language-bg-hook .................................... 76
TeX-language-cz-hook .................................... 76
TeX-language-de-hook .................................... 76
TeX-language-dk-hook .................................... 76
TeX-language-en-hook .................................... 76
TeX-language-es-hook .................................... 76
TeX-language-fi-hook .................................... 76
TeX-language-it-hook .................................... 76
TeX-language-nl-hook .................................... 76
TeX-language-pl-hook .................................... 76
TeX-language-pt-br-hook ................................ 76
TeX-language-pt-hook .................................... 76
TeX-language-sk-hook .................................... 76
TeX-language-sv-hook .................................... 76
TeX-macro-global ....................................... 15, 81
TeX-macro-private ....................................... 81
TeX-master ................................................ 54, 72
TeX-math-input-method-off-regexp ........................ 31
TeX-newline-function ................................... 36, 37
TeX-Omega-command ....................................... 61
TeX-one-master .......................................... 72
TeX-open-quote .......................................... 20
TeX-outline-extra ........................................ 52
TeX-output-dir .......................................... 69
TeX-parse-all-errors ..................................... 66
TeX-parse-self ........................................... 73, 78
TeX-PDF-from-DVI ........................................ 60
TeX-PDF-mode ............................................. 59
TeX-quote-after-quote .................................... 20
TeX-quote-language-alist ................................ 77
TeX-raise-frame-function ................................ 65
TeX-refuse-unmatched-dollar ............................ 22
TeX-region ................................................. 54, 55
TeX-save-query .......................................... 73
TeX-show-compilation ................................... 62
TeX-source-correlate-map ................................ 65
TeX-source-correlate-method ............................. 59, 64
TeX-source-correlate-mode ................................ 59
TeX-source-correlate-start-server ...................... 65
TeX-style-global ........................................ 81
TeX-style-local .......................................... 82
TeX-style-path .......................................... 80
TeX-style-private ........................................ 81
TeX-suppress-ignored-warnings .......................... 67
TeX-trailer-start ........................................ 54, 55
TeX-view-evince-keep-focus .............................. 64
TeX-view-predicate-list ................................ 63
TeX-view-program-list ................................... 63
TeX-view-program-selection .............................. 63
TeXinfo-clean-intermediate-suffixes .................... 69
TeXinfo-clean-output-suffixes ........................... 69
TeXinfo-mode-hook ....................................... 71
texmathp-tex-commands ................................ 47
texmathp-tex-commands-default ........................ 47

Concept Index

\item .......................... 29
\item ........................................ 16, 24
\item ........................................ 34
\item .......................................... 80
\item .......................................... 80
\item ........................................ 34
\item .......................................... 16, 24
\item .......................................... 16, 24
\item .......................................... 17, 23
\item .......................................... 17, 23
\item .......................................... 80
\item .......................................... 17, 23
\item .......................................... 80
\item ........................................ 23
Examining package/class options ............. 90
Example of a style file .......................... 82
Expansion ........................................ 32
External Commands ............................... 54
Extracting \TeX{} symbols ....................... 80

F
Faces ............................................. 48
FDL, GNU Free Documentation License ........ 95
Figure environment ............................... 29
Figures .......................................... 29
Filling ............................................ 39
Finding errors ................................... 68
Finding the current file ......................... 69
Finding the master file ......................... 69
Floats ............................................ 29
Flymake .......................................... 68
Folding ........................................... 49, 52
Font Locking ..................................... 42
Font macros ...................................... 23
font-latex ........................................ 42
Fonts ............................................. 23
Formatting ........................................ 36, 39, 54
Forward search ................................... 64
Free ............................................... 2
Free software .................................... 2

G
General Public License ............................ 2
Generating symbols ................................ 80
German ........................................... 76
Global directories ................................ 81
Global macro directory .......................... 81
Global style hook directory ....................... 81
Global \TeX{} macro directory ..................... 81
GPL .............................................. 2

H
Header ............................................ 54
Headers .......................................... 52
Hide Macros ...................................... 49
\LaTeX{} .......................................... 75

I
I/O correlation ................................... 59, 64
Including ......................................... 71
Indentation ....................................... 36
Indenting ......................................... 36
Indexing .......................................... 54
init.el ............................................ 7
Initialization ..................................... 15
input method ..................................... 31
Inputing .......................................... 71
Installation ....................................... 7
Internationalization ............................. 75
Inverse search ................................... 64
iso-cvt.el ........................................ 76
ISO 8859 Latin 1 .................................. 75
ISO Character set ................................ 75
ispell ............................................. 57, 76
Italian ............................................ 76
Itemize ........................................... 29
Items ............................................. 29

J
Japan .............................................. 78
Japanese .......................................... 78
\LaTeX{} .......................................... 78
\LaTeX{} .......................................... 75, 78

K
Killing a process .................................. 69
\LaTeX{} .......................................... 75

L
Label prefix ...................................... 26, 29
Labels ............................................ 26, 29
Labels, adding .................................... 90
labels, completion of .............................. 34
lacheck ........................................... 68
Language Support .................................. 75
\LaTeX{} .......................................... 54
Latin 1 ............................................ 75
License ............................................ 2
Literature ........................................ 54
Local style directory ............................. 82
Local style hooks ................................. 82
## M

- Macro arguments ................................................. 32
- Macro completion ............................................... 32
- Macro expansion ............................................... 32
- macro.el .......................................................... 92
- macro.tex ........................................................ 92
- Macros, adding .................................................. 84
- Make ............................................................... 7
- makeindex ........................................................ 54
- Making a bibliography ........................................ 54
- Making an index ................................................ 54
- Many Files ....................................................... 71
- Master file ....................................................... 69, 71
- Matching dollar signs ......................................... 20
- Math mode delimiters ......................................... 20
- Math, fontification of .......................................... 47
- Math, fontification problems with ........................... 48
- Mathematics ...................................................... 30
- Multiple Documents ........................................... 71
- Multiple Files ................................................... 71

## N

- Next error ......................................................... 66
- Nippon ............................................................. 78
- NTT \TeX .......................................................... 75, 78

## O

- Other information, adding .................................... 90
- Outlining ......................................................... 49, 52
- Output ............................................................ 69
- Overfull boxes .................................................. 66
- Overview ........................................................ 52

## P

- package/class options, Examining ......................... 90
- Parsing errors .................................................... 66
- Parsing \LaTeX{} errors ........................................ 66
- Parsing new macros ............................................ 92
- Parsing \TeX{} .................................................... 73, 80
- Parsing \TeX{} output ........................................... 66
- PATH in Windows ............................................... 11
- PDF mode ........................................................ 59
- PDFSync .......................................................... 59, 64
- Personal customization ........................................ 15
- Personal information .......................................... 81
- Personal macro directory .................................... 81
- Personal \TeX{} macro directory ............................... 81
- p\LaTeX{} ........................................................ 78
- Polish ........................................................... 76
- Portuguese ....................................................... 76
- Prefix for labels ............................................... 26, 29
- preview-install-styles ....................................... 6
- Previewing ....................................................... 62
- Printing ........................................................ 54
- Private directories ............................................ 81
- Private macro directory ...................................... 81
- Private style hook directory .................................. 81
- Private \TeX{} macro directory ................................ 81
- Problems ......................................................... 68
- Processes ....................................................... 69
- \p\TeX{} .......................................................... 75, 78

## Q

- Quotes ............................................................. 20
- Quotes, fontification of ..................................... 46

## R

- Redisplay output ............................................... 69
- Refilling ........................................................ 39
- Reformating ...................................................... 36, 39
- Region ........................................................... 54
- Region file ...................................................... 54
- Reindenting ..................................................... 36
- Reveal ........................................................... 49
- Right ............................................................. 2
- Running Bib\TeX{} ............................................... 54
- Running chktex .................................................. 68
- Running commands ............................................. 54
- Running Flymake ............................................... 68
- Running lacheck ................................................ 68
- Running \LaTeX{} ................................................ 54
- Running makeindex ............................................. 54
- Running \TeX{} ................................................... 54

## S

- Sample style file ............................................... 82
- Sectioning ....................................................... 16, 24
- Sectioning commands, fontification of ..................... 44
- Sections ......................................................... 16, 24, 52
- Setting the default command ................................ 54
- Setting the header ............................................. 54
- Setting the trailer ............................................ 54
- Site customization ............................................. 15
- Site information ............................................... 81
- Site initialization ............................................. 15
- Site macro directory ......................................... 81
- Site \TeX{} macro directory ................................... 81
- Slovak ............................................................. 76
- Source specials .................................................. 59, 64
- Specifying a font ............................................... 23
- Starting a previewer .......................................... 62
- Stopping a process ............................................. 69
- Style ............................................................. 68
- style ............................................................ 82
- Style file ........................................................ 82
- Style files ...................................................... 82
- Style hook ........................................................ 82
- Style hooks ...................................................... 82
- subscript ........................................................ 31
- Subscript, fontification of .................................. 47
Indices

superscript ........................................... 31
Superscript, fontification of .......................... 47
support for completion of
  package/class options, Adding ..................... 90
Swedish ................................................. 76
Symbols ................................................. 30
SyncTeX .................................................. 59, 64
Syntax Highlighting .................................... 42

T
Tabify .................................................... 73
Table environment ..................................... 29
Tables ................................................... 29
Tabs ...................................................... 73
tex-jp.el ................................................. 78
tex-mik.el .............................................. 14
tex-site.el ............................................. 7, 15, 115
\TeX ..................................................... 54
\TeX parsing ............................................. 80
tool bar, toolbar ...................................... 54
Trailer ................................................... 54

U
Underfull boxes ......................................... 66
Uninstallation ........................................... 7
Untabify .................................................. 73
Updating style hooks ................................... 82
up\TeX ................................................... 78
upTEX ................................................... 75, 78

V
Verbatim, fontification of ............................. 48
Viewer predicates ....................................... 90
Viewing .................................................. 62

W
Warranty .................................................. 2
Writing to a printer .................................... 54

X
X-Symbol ................................................ 76