rec-mode: an Emacs mode for editing recfiles

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This manual is for rec-mode 1.9.0 for Emacs, which is part of the GNU recutils suite. This rec-mode manual has last been updated 19 June 2022.

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1 Introduction

rec-mode is a mode for browsing and editing recfiles, which are text files containing data structured in fields and records. It is part of the GNU recutils[1] suite.

Recfiles are text-based databases which are easy to read and write manually using a text editor. At the same time they feature enough structure so they can be read, edited and processed automatically by programs.

1.1 Installation

rec-mode is implemented in a self-contained elisp file called `rec-mode.el`. It can be obtained in several ways:

- From GNU ELPA (`https://elpa.gnu.org/packages/rec-mode.html`) using the built-in Emacs package manager.
- As part of the source tree cloned from the development git repository of rec-mode. `rec-mode.el` can be found in the root directory of the recutils sources tree.
- As a single file downloaded form some other location in internet.
- It may be already installed as part of a binary package in some distribution.

In the second case you need to tell Emacs where to locate the `rec-mode.el` file and to load it. Add the following to your `.emacs` file.

```
(add-to-list 'load-path "~/path/to/recmode/")
(require 'rec-mode)
```

If `rec-mode.el` was installed as part of a binary package in a distribution then you usually don't have to touch the `load-path` variable. Depending on the specific case you may have to `require` the package.

1.2 Activation

rec-mode should automatically activate when opening `.rec` files. To make sure files with extension `.rec` use rec-mode, add the rec-mode buffers need font-lock to be turned on - this is the default in Emacs[2].

If the file doesn't end in `.rec`, make the first line of a recfile look like this:

```
# -*- mode: rec -*-
```

which will select rec-mode for this buffer no matter what the file's name is.

1.3 Feedback

If you find problems with rec-mode, or if you have questions, remarks, or ideas about it, please mail to the recutils mailing list `bug-recutils@gnu.org`. If you are not a member of the mailing list, your mail will be passed to the list after a moderator has approved it[3].

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[1] `http://www.gnu.org/software/recutils`

[2] If you don't use font-lock globally, turn it on in the rec buffer with `(add-hook 'rec-mode-hook 'turn-on-font-lock)`

[3] Please consider subscribing to the mailing list, in order to minimize the work the mailing list moderators have to do. The subscription can be done online at `http://lists.gnu.org/mailman/listinfo/bug-recutils`.

2 Navigation mode

When a recfile is visited in Emacs and rec-mode is activated, the contents of the file are examined and parsed in order to determine if it is a valid recfile and, in that case, to extract information like the kind of records stored in the file.

If the file does not contain valid rec data then the buffer is put in `fundamental-mode` and a description of the syntax error, along its location, is notified in the echo area.

If the file contains valid rec data, the mode sets itself in what is known as "navigation mode". In this mode the buffer is made read-only and it is narrowed to the first record present in the file. Also, the presentation of the record contents is slightly changed in order to improve the visualization of the data: continuation line marks are replaced by indentation, big fields are folded, etc. The modeline is changed in order to reflect the type of the records being navigated.

At this point the user can navigate through the records and fields contained in the file, and edit the contents of the fields and the structure of the records, by using the commands described in the following subsections.

2.1 Record navigation

The following commands jump to other records in the buffer.

`n`
`M-x rec-cmd-goto-next-rec`
> Display the next record of the same type in the buffer.
> 'C-u N n' will move next N times.

`p`
`M-x rec-cmd-goto-previous-rec`
> Display the previous record of the same type in the buffer.
> 'C-u N p' will move backwards N times.

`d`
`M-x rec-cmd-show-descriptor`
> Display the record descriptor applicable to the current record. If the current record is anonymous, *i.e.* there is not record descriptor. then this command does nothing.

`b`
`M-x rec-cmd-jump-back`
> Display the record previously displayed in the buffer.

`C-c C-t`
`M-x rec-find-type`
> Prompt the user for one of the record types present in the recfile and display the first record of the selected type.

2.2 Field navigation

The following commands iterate through the fields in a record, and to get information about some of the properties of the fields.

`TAB`
`M-x rec-cmd-goto-next-field`
> Move the cursor to the beginning of the name of the next field in the current record. If the cursor is currently located at the last field of the record then move it to the beginning of the first field.

`t`
`M-x rec-cmd-show-type`

> Show information about the type of the field under the cursor, if it is defined.

2.3 Field folding

Fields in recfiles can contain data of any size, and sometimes it is difficult to have an overview of the contents of the record. The following commands fold and unfold the value of the field under the cursor.

`SPC`
`M-x rec-cmd-toggle-field-visibility`

> Toggle the visibility of the field under the cursor. When a field is folded then three dots are displayed in the buffer instead of the value of the field.
>
> It is possible to automatically fold any field whose value exceeds a certain limit which can be configured by the user. See Section 7.2 [Records appearance], page 11.

2.4 Field edition

The following commands change the value of the field under the cursor.

`e`
`M-x rec-cmd-edit-field`

> Edit the value of the field under the cursor. The specific action depends on the type of the field in the corresponding record descriptor:
>
> — For **date** fields a calendar buffer is opened in another window and the focus is moved there. The user can then select a date by moving the cursor there and press `RET` in order to set that date as the value for the field. Alternatively the user can press `t` in order to set the field to "now", or `q` to cancel the operation. In the later case the value of the field is left untouched.
>
> — For **enumerated** and **bool** fields a fast-select buffer is opened in another window, showing a list of labeled options. The labels are single digits and letters. The user can then select ony of the options by pressing the corresponding label, or cancel the operation by pressing `RET`. In the later case the value of the field is left untouched.
>
> — For any other kind of fields an edition buffer is opened in another window, showing the current contents of the field. The user can then edit the buffer as desired. When she is done, the user can then press `C-c C-c` in order to set the new value of the field, or just kill the buffer to cancel the operation.

`m`
`M-x rec-cmd-trim-field-value`

> Trim the value of the field under the cursor, removing any sequence of leading and trailing blank characters.

2.5 Searches

The following commands jump to the first record in the buffer satisfying some criteria.

`s q`
`M-x rec-cmd-jump-to-fast`

> Display the first record having a field whose value matches a given fixed pattern. This is equivalent of using the command line option `-q` of `recsel`. If a prefix argument is specified then the search is case-insensitive.

`s s`

`M-x rec-cmd-jump-to-sex`

> Display the first record in the buffer satisfying a given selection expression. This is equivalent of using the command line option `-e` of `recsel`. If a prefix argument is specified then the search is case-insensitive.

2.6 Statistics

The following commands allow to count records in the current buffer based on some provided criteria.

`I`

`M-x rec-cmd-show-info`

> Show the number of records in the buffer categorized by type.

`#`

`M-x rec-cmd-count`

> Count the number of records in the buffer having the same type as the current record. With a numeric prefix N, ask for a selection expression and count the number of records in the buffer satisfying the expression.
>
> Note that rec-mode tries to guess a reasonable default for the selection expression, depending on the type of the field and its value. If the user press `RET` then the provided default selection expression is used.

`%`

`M-x rec-cmd-statistics`

> If the field under the cursor contains an enumerated value, show the percentages of records in the current record set having fields with each of the possible values of the enumerated type.

2.7 Data integrity

The integrity of the rec data stored in the file can be checked using the following commands.

`c`

`M-x rec-cmd-compile`

> Compile the buffer with `recfix` and open a compilation window showing the result of the command. In case some error or warning is reported, the user can jump to the location triggering the error by pressing `RET` in the compilation window.

3 Edition modes

The navigation mode described in a previous chapter is mainly intended for browsing recdata and doing changes at the record level: editing the contents of a field, adding or removing fields, etc. In order to perform broader changes, such as adding/deleting record descriptors, records or comment blocks, the user must enter into one of the "edition modes".

There are three edition modes, covering different areas of the recfile: record, record type and buffer. When an edition mode is entered the buffer is set in read/write mode, it is narrowed to the desired area and any embellishment used in navigation mode is removed[1]. As a general rule, the commands available in navigation mode are also available in the edition mode prefixed with `C-c` and with a control sequence `C-`. Thus, `n`, which in record navigation mode jumps to the next record, becomes `C-c C-n` in the record edition modes. The exceptions to this are the bindings `c` (`rec-cmd-compile`) which becomes `C-c C-k` and `h` (`rec-cmd-show-summary`) which becomes `C-c M-h`.

The following commands are used to enter into one of the available edition modes from the navigation mode.

`R`
`M-x rec-edit-record`
> Edit the record being navigated.

`T`
`M-x rec-edit-type`
> Edit the record set being navigated.

`B`
`M-x rec-edit-buffer`
> Edit the buffer.

After doing modifications in the buffer, the user can go back to navigation mode by using the following command.

`C-c C-c`
`M-x rec-finish-editing`
> Finish the current edition and return to navigation mode. If a syntactic error was introduced in the edition activity then the error is reported in the echo area and navigation mode is not entered.

---

[1] Exceptuating font-lock

4 Summary mode

Besides the standard viewing modes of buffers, there is also a third option called *summary mode*. Summary mode is a tabulated list of the record in which each record is a row in the table. The columns in the table are determined by user input, or alternatively, by special keys in the current file.

h
M-x rec-cmd-show-summary
> Creates a summary buffer from the current type being viewed in the recfile. The columns are based on user input (prompted), or if the record has either a `%summary` or `%key` in its descriptor, those fields are used.

The input for the summary query is a *field expression*, a comma-separated list of column names. Thus, if your recfile looks like the following:

```
Name: Ada Lovelace
Age: 36

Name: Peter the Great
Age: 53

Name: Matusalem
Age: 969
```

Then calling `rec-cmd-show-summary` and entering `Name,Age` would create a table of all records with those columns. If your record descriptor contains a `%summary` like below:

```
%summary: Age,Name
```

then this is used as the field expression instead. Similarly, if no `%summary` field is defined and a `%key` field exists, then that field is used.

Calling this command enters *record summary mode*, which a a major mode derived from *tabulated list mode* (see Section "Tabulated List mode" in `elisp`). In this mode, the following bindings are available:

n
M-x rec-summary-cmd-next
> Go to the next record in the summary.

Navigation inside the summary buffer maintains the position of the associated recfile buffer, and vice versa. The currently active record in the recfile is shown highlighted in the buffer. As a result, the summary can be thought of as a useful "overview" overview for any recfile buffer.

5 Selecting records

Sometimes it is useful to operate or inspect only a subset of all the records on the file. To this end, rec-mode provides several ways of using the searching facilities of recutils.

Selection can be done using two mechanisms:

- **selection expressions**, which are expressions that can be applied to a record. These offer a powerful query language for records. See Section "Selection Expressions" in *GNU Recutils manual*.

- **fast string searches**, which match records whose field values match a string.

For instance, you can create a new buffer out of the current buffer, so that only the records that match your search are copied. This way you can create new recfiles out of existing ones based on selections.

To help navigate the buffer based on a search, you can create a new navigation mode where the commands for moving between records only move to those matching a search. This is known as selection mode.

5.1 Buffer from selection

Creating new recfiles based on selections can be done by creating a wholly new buffer using the *buffer from selection* commands in rec-mode.

`x s`
`M-x rec-cmd-new-buffer-from-sex`

> Creates a new buffer from a *selection expression*. See Section "Selection Expressions" in *GNU Recutils Manual*. Prompts the user for a selection expression and then displays a new buffer containing records that match the expression.

`x q`
`M-x rec-cmd-new-buffer-from-fast-string`

> Creates a new buffer from a *fast string search*. Prompts the user for a *string* and then displays a new buffer which contains all records whose any field contains this string.

In both of these commands, if the recfile has a *record descriptor*, it is copied as well.

5.2 Selection mode

In both navigation mode and the assorted edition modes, `rec-cmd-goto-next-rec` and `rec-cmd-goto-prev-rec` navigate to the next and previous record, respectively. On large files, finding a particular record using these commands only can be quite tedious. To this end, using selections, it is possible to jump to or restrict navigation to records matching selections.

Restricting the navigation commands, typically bound to `n` and `C-c C-n` (*mutatis mutandis* for backward movement), to records that match the current selection, can be done using what is called *record selection mode*.

Record selection mode is a buffer-local minor mode in which the commands for next and previous records as described above do not behave the usual way: they navigate records that only match the currently active selection.

When selection mode is entered, any associated summary buffer automatically updates its contents to match that of the current selection. Once selection mode is turned off, the summary buffer reverts back to the previous selection.

Record selection mode can be entered by the following commands:

`/ s`
`M-x rec-cmd-navigate-current-type-by-sex`
> Prompts the user for a selection expression, runs a query on the current buffer and the current type, and then enters record selection mode.

`/ q`
`M-x rec-cmd-navigate-current-type-by-fast-string`
> Same as above, but with a fast string search.

In record selection mode, besides the standard navigation bindings, the following additional bindings are defined:

`/ /`
`M-x rec-cmd-exit-selection`
> Exits record selection mode and restores the normal navigation keybindings.

6 Cross referencing

Besides navigation, edition and selection, rec-mode provides another powerful feature for recfiles, known as *cross referencing*. In short, cross referencing is an Emacs term for listing various kinds of search results for certain keywords an identifiers. For records, this could mean the following:

Finding the referred record of a foreign key. If a field is a key referring to another record, you can jump to that record.

1. Finding the *referents* of a record if it is a foreign key.

2. Finding records that match a certain selection expression or fast string search.

Emacs provides a unified interface for this called Xref, see See Section "Xref" in *GNU Emacs Manual*. rec-mode implements a custom xref backend for the purpose of easier navigating between records.

Regardless of functionality, if there are more than one search result, Xref searches present their results in a special `XREF` buffer. It is an ordered list of results, similar to compilation mode (see Section "Compilation Mode" in *GNU Emacs Manual*). Xref makes it easy to navigate between search results, as it binds the `next-error` functionality, letting you navigate the results even if you are *outside* the rec mode buffer.

6.1 Cross-referencing records using foreign keys

When a record field is a reference to another record, it is possible to use navigate from the referring field to that record. Consider the following record:

```
%rec: Book
%type: Published int
%type: Author rec Author

Title: Cat's Cradle
Published: 1963
Author: KurtVonnegut

Title: Breakfast of Champions
Published: 1973
Author: KurtVonnegut

Title: The Left Hand of Darkness
Published: 1969
Author: UrsulaKLeGuin

%rec: Author
%key: Id

Id: UrsulaKLeGuin
Name: Ursula K. Le Guin

Id: KurtVonnegut
Name: Kurt Vonnegut, Jr.
```

6.1.1 Navigating to referred records

Navigating to `Author` field of the `Book` records and hitting `M-.` (`xref-goto-definition`) will jump the editor to the corresponding `Author` record. The requirement is that the current field

is a valid foreign key, i.e. the field is a record reference and the referred record exists in the current buffer.

6.1.2 Finding record references

On the other hand, in the above example, navigating anywhere on an `Author` record, it is possible to list all the records referring *that* record using `M-?` (`xref-find-references`). This works on any field of the record, since we foreign keys *to* the record work on the record level.

6.1.3 Commands for cross-referencing

`M-.`
`M-x xref-goto-definition`

> Jump to the record referenced by this field, if possible. Use `M-.` and `C-M-,` to jump between the results.

`M-?`
`M-x xref-find-references`

> List all the records that reference this record. The record referenced must have a `%key` in its descriptor for this to work, and to get any results the referring records must have properly used foreign keys.

For more keybindings, See Section "Looking Up Identifiers" in *Gnu Emacs Manual*. For more info about foreign keys in recutils, See Section "Foreign Keys" in *Recutils Manual*.

6.2 Cross referencing by selection

Cross referencing *by selection* lets you perform a query and then list the results using the Xref buffer. Rec mode provides two such commands:

`X s`
`M-x rec-cmd-xref-sex`

> Query the current recfile using a selection expression and the current type and then list the results using Xref. Each results shows a small snippet of the matched record making it easier to identify which records matched the search.

`X q`
`M-x rec-cmd-xref-fast-string`

> Like above, but using a fast string. Instead of previewing the first three fields of a record, it shows each field where there was a match.

7 Configuration

rec-mode can be configured using the customization facilities of Emacs.

7.1 Finding the recutils

`rec-mode` makes use of the several utilities which are part of the recutils. The following variables tell the mode where to find the utilities. The default values of these variables must work if the recutils are installed system-wide in the system.

`rec-recsel`   [Variable]
    Name of the `recsel` utility from the GNU recutil.

`rec-recinf`   [Variable]
    Name of the `recinf` utility from the GNU recutils.

`rec-recfix`   [Variable]
    Name of the `recfix` utility from the GNU recutils.

7.2 Records appearance

The appearance of the records in navigation mode can be customised by tweaking the value of the following variables.

`rec-max-lines-in-fields`   [Variable]
    Values in fiels having more than the specified number of lines will be hidden by default in navigation mode. When hidden, an ellipsis is shown instead of the value of the field. Default is `15`.

Command and Function Index

Key (Character) Index

Variable and Concept Index

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