

Introduction to Org Mode for ESS users

part of the ESS intro series

Greg Minshall

March 31, 2021

Outline

Org Mode

"If Emacs is the distribution, Org Mode is the entire desktop environment one runs on top of it."

Emacs Org Mode is an outline-structured file format and backing software that allows you to (among many other things)

- ▶ markup text via **asteriskizing**, equalizing, ~~plusizing~~, *slashizing*, tildeizing, underscorizing, etc.
- ▶ export a file, or a subtree of it, as, e.g., an .html or .pdf file
- ▶ take notes
- ▶ create agendas (items with date elements)
- ▶ organize your LIFE!
- ▶ do calculations – good support for math, \LaTeX , etc.
- ▶ table support for storing information (including support for formulae)


Babel – Org Mode support for programming

One can write source code in "source blocks". Source blocks have the following attributes:

- ▶ a name (optional)
- ▶ source code, one language per source block (though, if desired, multiple languages per file)
- ▶ "header arguments", parameters which define how a source block interacts with its environment

"To a source block", you can

- ▶ **evaluate** it (`[C-c C-c]`¹) to produce results, which, in turn, may be used as input to another source block. **NB:** there are security issues here: you will need to customize the Emacs variable `org-babel-load-languages`, and you will be prompted each time before a code block is evaluated.
- ▶ **export** it (`[C-c C-e]`), either the code, its results, or both, into a `.html`, `.pdf`, or other format file
- ▶ **tangle** it (`[C-c C-v t]`), that is, write the source code itself into a separate file, that might be used as input to a compilation or some other packaging step, or be a stand alone script (Rscript, say).
- ▶ **edit** it (`[C-c ']`), either in place in the Org buffer, or "stand alone" in an Org Source buffer, with the possibility of real-time syntax checking/linting, etc.

¹The key sequence `[C-c C-c]` is used extensively in Org mode; the specific action taken is determined by the buffer context in which it is executed. 

R source blocks

In particular, one can have a source block with R code

```
#+begin_src R :results value
  "here, the last value executed is the result"
#+end_src
```

```
#+begin_src R :results output
  cat("here, the output is the result\n")
#+end_src
```

To evaluate an entire source block in an Org buffer, type
[C-c C-c] or [C-c C-v e].

To edit this source block in an Org Src buffer, type [C-c ']. To
close the Org Source buffer and return to the Org buffer, type
[C-c '] again.

Header arguments

- `:noweb` allows code from another place in the org file to be inserted at a point in the current org file when evaluating or exporting.
- `:var` allows results of other computations in an org file to be used as input to this source block
- `:results` defines how results are collected after evaluation of the source block, and how (or whether) they are inserted into the org buffer
- `:tangle` name of file to which to *tangle* the contents of this source block
- `:session` normally, source blocks are evaluated in a "pristine" environment (a new R process, say); with this option, successive evaluations of source blocks can occur within a single process.

Org Src buffers for R

Again, [C-c '] to enter and to exit.

An Org Src buffer for R is an ESS[R] mode buffer.

Evaluating code is still initiated with [C-c C-c], but tends to send just the function at the current location to be evaluated (rather than the whole Org Src buffer), and moves the cursor ("point") to the start of the next function.

Other resources (I)

For Emacs:

- ▶ SystemCrafters' playlists include various introductory videos.

For Org Mode:

- ▶ The Org Mode web site.
- ▶ Rainer König has a series of videos (now also available as a course on Udemy).
- ▶ DT ("Distro Tube"?) has yet another introductory video.
- ▶ The Org Mode community site ("worg") has a section about Babel.

For Org mode with R:

- ▶ Erik Riverson many years ago produced a tutorial that, while dated in some places, is still very useful.
- ▶ XXX A copy of a longer exposition of this tutorial XXX

Other resources (II)

For everything:

- ▶ the Emacs, etc., "info pages" (`[C-h i]`), which include information on Emacs, Org Mode, etc. (even R, depending on your installation), provide very detailed information.

There are various ways to connect with other Org Mode users listed here. Similar information for ESS is here.

Farewell

Thank you for "attending" this tutorial. I hope it has given you a sense of Org Mode. This has been more of a teaser than an exhaustive introduction, but the resources we listed above should be enough to ease you into using R with Org Mode.