

Introduction to Org Mode for ESS users

part of the ESS intro series

Greg Minshall

April 7, 2021

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, L^AT_EX, 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** (`[C-c C-e]`) the code, its results, or both, with other parts of the .org file, 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, either in place in the Org buffer, or "stand alone" in an *OrgSrc* buffer (`[C-c ']`¹), with the possibility of real-time syntax checking/linting, etc.

¹with point in the source block

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 OrgSrc 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

:session outlined on next slide

:tangle name of file to which to *tangle* the contents of this source block

:session header argument

- ▶ Normally, Org Mode evaluates a source block by forking a new R subprocess, passing it the code (and any variables to be used as input), letting the code run, capturing the results, and then disposing of the R subprocess. This ensures that code runs in a fresh environment.
- ▶ Often, especially when doing statistical analysis, we would like to build up state over time, by executing various code blocks, and/or by poking in the environment.
- ▶ Also, we may want to debug our code in a convenient way.

For these reasons, the `:session` header argument is very useful. All source code blocks specifying the same session name in the `:session` header argument run in the same inferior ESS (`iESS`) process.

A style of working

In Emacs, I find that I spend time bouncing between three buffers:

- ▶ the .org file, often doing minor in-line edits in a source block
- ▶ an OrgSrc edit buffer, for more major edits (and get font lock, etc.); this buffer comes and goes, as needed
- ▶ the R :session buffer to run code, examine results, and debug as needed

Other resources

- ▶ the official [Quick Start](#) guide, a very good introduction to Org Mode
- ▶ the [Org Mode](#) web page
- ▶ the Org Mode [worg](#) site
- ▶ the other presentations in this [ESS intro series](#)
- ▶ the beamer slides for this tutorial are [here](#) (pdf)
- ▶ a [.org file](#) for experimenting (an HTML version [here](#) and a PDF one [here](#))

Tutorials, Videos

There are some nice tutorials:

- ▶ a somewhat older one is from Erik Iverson, org-mode-R-tutorial.org
- ▶ a more recent one from Vikas Rawal, orgpapers.org

And, some videos, including:

- ▶ Rainer König's [screencasts](#) about Org Mode (also available as a [course on Udemy](#))
- ▶ DT ("Distro Tube"?) has yet another [introductory video](#).

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.