

BIOS 545 “Introduction to R programming” lab: R package II

This lab focuses on writing R function helps and vignette. We will also practice writing \LaTeX .

1 System setup

One needs to install necessary software and setup system environment in order to use command line to build R packages. In additions, LaTeX needs to be installed in order to use Sweave. Before the lab please set everything up so that we can focus on R packages.

Install \LaTeX :

- **On Windows**, download and install **MiKTeX** (<http://miktex.org/>).
- **On Mac**, download and install **MacTeX** (<http://www.tug.org/mactex/>, the full installation package is ridiculously 2.4Gb).
- **On Linux**, it's preinstalled so you don't need to do anything.

Install an editor for \LaTeX :

It's completely fine to use a **simple text editor** to write latex files (NEVER use word processor software such as MS Word for that purpose). For example you can use **Rstudio**, **TextEdit** on Mac or **notepad** on Windows. However it'll be easier to use a GUI. I recommend **TexShop** (<http://pages.uoregon.edu/koch/texshop/>) on Mac, and **WinEdt** (<http://www.winedt.com>) on PC. WinEdt is a commercial software and one needs to pay (with one month free trial). Google “latex editor windows” to find other options.

2 Write R function help

In last lecture, you have created the **median** package without writing a help for your powerful **mymedian** function. In this lab, follow the steps below to create a function help.

1. In R, after loading in **median** package, type `prompt(mymedian)`. This will create a file called `mymedian.Rd`, which is the template of an R function help file.
2. Outside R, open `mymedian.Rd` in text editor and fill in necessary fields.
3. Copy `mymedian.Rd` file to the `man` directory in your package source, then rebuild/reinstall the package.
4. Load in the new R library, and type `?mymedian` to see your function help. You probably need to restart R to see that.

Congratulations. You know how to build a real R package now!

3 Simple latex

Follow the steps below to create a pdf file using latex.

1. Create a file called `coolpkg.tex`.
2. Copy/paste the latex content in the lecture slide to the file.
3. Compile the latex file and obtain the pdf.

4 Write R document with Sweave

1. Create a file called `median.Rnw`, and copy the simple LaTeX example on class note to it.
2. Modify the Result section to add following lines:

```
<<echo=TRUE, eval=TRUE>>=  
mymedian(rnorm(100))  
@
```

3. Type `Sweave("median.Rnw")` in R. This will result in a new file `median.tex` under current directory.
4. Compile the tex file to get a pdf. Note you need `Sweavy.sty` in current work space. The file is available on class website.

If the above work fine, e.g., the pdf looks good, create a new directory `vignettes` under your package directory and copy the Rnw file over. Rebuild and reinstall the package. It'll contain a vignette now. Load the newly built/installed package in R. Type `vignette("median")`, and you'll see the vignette.

Time permitting, you can add some figures in the package vignette, following the instructions on the class notes.