PS630 R Lab Session Quick Guide

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R

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

RStudio

RStudio is an integrated development environment (IDE) for R. It includes a console, syntax-highlighting editor that supports direct code execution, as well as tools for plotting, history, debugging and workspace management.

R Markdown

R Markdown provides an authoring framework for data science. You can use a single R Markdown file to both

- save and execute code
- generate high quality reports that can be shared with an audience

R Markdown documents are fully reproducible and support dozens of static and dynamic output formats. R Markdown has the following features:

- Fully reproducible reports
- Simple markdown syntax for text
- Code goes in chunks

Tip: Keep the Markdown cheat sheet handy, we'll refer to it often as the course progresses. Check the cheat sheet: https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf

Installation

Please install R and RStudio from the following websites before the first lab session. You should first install R and then install RStudio. In this lab session, we use the R version of 3.6.0 (or later) and RStudio Desktop. Both are free :).

Installing R

- Open an internet browser and go to www.r-project.org.
- Click the "download R" link in the middle of the page under "Getting Started."
- Select a CRAN location (a mirror site) and click the corresponding link.
- Click on the "Download R for Windows" or "Download R for (Mac) OS X". You could also use Linux if you are a Linux User.
- Click on the file containing the latest version of R under "Files."
- Save the file, double-click it to open, and follow the installation instructions.

Installing RStudio

- Go to https://www.rstudio.com/products/rstudio/download/
- Click on "Download RStudio Desktop."
- Click on the version recommended for your system, save the downloaded file on your computer, double-click it to open, and follow the installation instructions.

Using RStudio

This is a quick guide of RStudio Interface: https://dss.princeton.edu/training/RStudio101.pdf. Highly recommended for R beginners.

Installing Packages in R or RStudio

- After installing R and RStudio, open RStudio
- In the `console`, enter the following codes

```
# install packages
install.packages("tidyverse")
install.packages("rmarkdown")
```

Installing R Markdown in RStudio

In this class, we primarily use R Markdown to present our work and do problem sets.

You could check this quick tour of R Markdown: https://rmarkdown.rstudio.com/authoring_quick_tour.html

Here is the cheat sheet :))

https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf

Good Programming Habits

Nice programming style helps exchange ideas with other R users. You could read http://adv-r.had.co.nz/Style.html for advice on writing readable code.

Reference

- R Project: https://www.r-project.org/
- R Studio: https://www.rstudio.com/
- R Markdown: https://rmarkdown.rstudio.com/lesson-1.html
- Advanced R: http://adv-r.had.co.nz/