STA 108 Discussion 1: Course Setup

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1 R set up

1.1 Online approach

For students in UC Davis, it is recommend to use the Jupyterhub service after logging in using your UCD account. You don't need to download any packages to your local machine by using the online JupyterLab.

On JupyterLab, you can launch Terminals, Code Consoles, or Jupyter notebook. To create an R-backed jupyter notebook, just click the R kernel under "Notebook". The `Code` cells enable you to write and run R codes, and `Markdown` cells allow you to input text in Markdown style. Then you can export **PDF** file from the notebook to get codes embeded report. Markdown for Jupyter notebooks cheatsheet

1.2 Local approach

1.2.1 Install R:

- Go to http://cran.freestatistics.org/.
- Select the appropriate package based on your operating system.
- Follow the installers instruction.

1.2.2 Install RStudio:

- Go to https://rstudio.com/products/rstudio/download/.
- Select the "Desktop" version.
- Select the installer based on your operating system (usually the recommended for your system works just fine).

1.2.3 Starting RStudio

- Click RStudio icon to run this program, and R will be open automatically in the background at the same time. You should have 4 panels. A brief description of the four windows follows:

  - **Environment, History, Build, VCS**: This window lists all Data, Values Functions entered.
  - **Files, Plots, Packages, Help**: Should you use the help command (the ?) in R, the relevant help document will be opened here.Should you plot a figure, the relevant figure will be displayed.
  - **Console**: Where you type in your commands and retrieve your output.
  - **Source**: A convenient place to store your commands, which can then be sent to the console via keyboard shortcuts or with a button.

- Ways of typing commands in R:

  - Type code in Console

- – [**Recomended**]Create a new source file and type code in the file: click the green cross (+) in the topleft corner, choose "R script"/"R notebook"/"R markdown".
- Running R code:
  - – In R Console: hit *Enter* after the command line
  - – In R Source files: Highlight the part you need to run and hit the "run" button on the menu; or apply the shortcut: *Ctrl/command + Return*(MAC) or *Ctrl + Enter*(Windows)
- Save R Source files (Script, notebook, markdown):
  - – click the blue square button in the source window.
  - – click File > Save/ Save as.

1.2.4 Install the R Markdown packages (to generate codes/output embeded pdf):

R markdown is used within RStudio. You can compile a single R Markdown document to a report in different formats, such as PDF, HTML, or Word.

- Install Markdown package by typing this command in R **Console**:

```r
install.packages("rmarkdown")
```

- Install LaTeX (TinyTeX) for PDF reports by typing this command in R **Console**:

```r
install.packages("tinytex")
tinytex::install_tinytex()
```

1.2.5 Create a R markdown file

- Make sure you already have downloaded the required packages.

- In RStudio, click the green "+" in the top left> R markdown > write a title and choose output file format > OK

- Type text in the white space for your report, and only write R code in the grey R chunck, which can be created by click Insert>R or type ```{r} at the begining and ``` at the end.

- When you click the **Knit** button, a document will be generated that includes both content as well as the output of any embedded R code chunks within the document.

1.3 Tutorial Links

- R coding tutorial: https://www.w3schools.com/r/default.asp.
- R Markdown Basics: https://rmarkdown.rstudio.com/authoring_basics.html.