

Discussion 1

*TA: Zhikuan Quan, zkquan@ucdavis.edu**Office Hour: Thursday 4:30 pm - 6:30 pm*

1 Discussion

The discussion section will provide additional help on **data analysis (in R)**, **concept understanding**, and **homework assignments/quizzes**. Discussion notes will be uploaded to the Home page on Canvas weekly.

2 Setting Up R

2.1 Installing R

One of the wonderful things about *R* is that it is free. This way, you may work on your homework in the comfort of your home. To download and install R, complete the following steps:

1. Go to <http://cran.freestatistics.org/>
2. If you have Linux, click "Download R for Linux" and select the appropriate platform.
3. If you have a Mac, click "Download R for (Mac) OS X", and select the appropriate package based on your operating system.
4. Follow the instructions of the installer.

Congratulations, you have now (hopefully) installed R.

2.2 Installing RStudio

To install RStudio, complete the following steps:

1. Go to <http://rstudio.org/>
2. Click on the "Download RStudio" button.
3. Select the "Desktop" option.
4. Select the appropriate link (usually the recommended one for your system works just fine).

2.3 Installing R Markdown packages

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

```
install.packages('rmarkdown')
```

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

```
install.packages ('tinytex')
```

- Once the installation has been completed, type

```
tinytex::install_tinytex()
```

3 Brief introduction to Rstudio and R Markdown

3.1 Rstudio

- Click the RStudio icon to run this program, and R will open automatically in the background at the same time. You should have 4 panels. A brief description of the four windows follows:
 1. **Environment, History, Build, VCS:** This window lists all Variables, Data, and Functions defined by us.
 2. **Files, Plots, Packages, Help:** We can use the help or ? command to get the documentation of any functions, and the relevant help document will be opened. Furthermore, if we plot a figure, it will be displayed in this panel as well.
 3. **Console:** The place we can type in commands and retrieve our output.
 4. **Source:** The place to store our commands.
- Ways of typing commands in R:
 1. Type code in Console
 2. **Recommended:** Create a new source file, type code in the file:
click the green cross (+) in the top left corner, and choose "R script".
- Running R code:
 1. In R Console: hit *Enter* after the command line
 2. In R Source files:
Place the cursor in the line or highlight the part you want to run and hit the "run" button on the menu, or apply the shortcut: **command + Return(MAC)** or **Ctrl + Enter(Windows)**
- Save R Source files (Script, notebook, markdown):
 1. click the blue square button in the source window.
 2. click File > Save/ Save as.

3.2 R Markdown

- Create an R markdown file:
 1. Click the green “+” in the top left in Rstudio > R markdown > write a title and choose output file format > OK
 2. Type text in the white space for your report
 3. Write R code in the grey R chunk, which can be created by typing ````\r{}```` at the beginning and ````\r{}```` at the end.
 4. Click the **Knit** button to generate your pdf/html file by R Markdown file.
- More details about R Markdown: https://rmarkdown.rstudio.com/authoring_basics.html
- An R Markdown Cookbook: <https://bookdown.org/yihui/rmarkdown-cookbook/>