228.371 Computer Lab: Using R

Semester One 2015 - Week 1

Instructions: In this lab we will get used to using R and RStudio.

This practical assumes that you have read the R tutorial from the corse Stream site, or that you have a copy of it nearby for reference.

Remember that R does have a built-in help facility: to get information about a specific procedure use the "?" symbol. For example, to get help on the `plot()` command type `?plot` at the R console. This will often show the many options each command has, together with their default values.

1 Using R

Open R by selecting it from the Start menu and set the working directory to the directory of your choice in your `My Documents` directory (`File → Change dir...`).

1. Perform the following basic calculations using R.

   - $(1 + 3^2)/(27 - 22)$
   - π^3 (use the constant `pi`)
   - e^{10} (use the `exp()` function)

   (*Answers:* $2, 31.00628, 22026.47$)

2. Create variables, `x`, and `y`, containing values 100, and 200 respectively.

3. Set a third variable, `z`, to be the sum of `x` and `y`.

4. Save your workspace in an `.RData` file called `Work.RData` in the working directory you selected previously (`File → Save Workspace...`).

5. Quit R without saving the workspace by selecting `Exit` from the `File` menu and choosing `No` when prompted to save the workspace image.

6. Restart R and load your saved workspace (`File → Load Workspace...`) Type `ls()` to list the objects in R and you should see the three objects (`x`, `y` and `z`) that you saved before. Type the name of each variable and check that it still has the correct value.

7. When you have finished quit from R without saving as before.

2   Using RStudio

1. Start RStudio.

2. Open a new file - File → New File → R Script.

3. Save the file as Test.R somewhere on your network drive.

4. Set the working directory to the source file location - Session → Set Working Directory → To Source File Location.

5. Type the following R code into the text editor.
   ```
   x <- rnorm(n=100, mean=10, sd=3)
   mean(x)
   ```
   ```
   [1] 9.713575
   ```
   ```
   sd(x)
   ```
   ```
   [1] 3.162262
   ```
   ```
   hist (x)
   ```

6. Hightlight the code and press the Run button.

7. Save the resulting plot - Plots → Save as PDF.

8. Save the script file and quit - File → Quit RStudio (Save Selected).