STAT2008/6038 Regression Modelling Worksheet 1

1 Introduction

You should read and work through this entire worksheet prior to attending your first R tutorial. This worksheet will introduce you to the R Environment. This worksheet assumes R has been installed on a PC.

Before reviewing R commands, it is important for you to set up a working directory for all the work you will be doing during this course.

1. Determine where you would like to save your work. For example, will you be saving it to an external thumb drive or to your home folder found on the H : drive.. I prefer to use an external drive and I have created a folder called "Working" which can be found at the path: F:\STAT2008\2013. Your path will be different. If you are having problems setting your working directory or locating files please ask your tutor or me!

2. Open $R \rightarrow$ Start $\rightarrow$ All Programs $\rightarrow$ Statistics and Data Analysis $\rightarrow$ $R \rightarrow$ R for Windows 2.14.0

You will notice the R does have a few pull-down menus, but mostly commands in R are entered on the command line:

>

1.1 Setting your working directory

1. In R go to File $\rightarrow$ Change dir and then locate your working directory $\rightarrow$ OK

2. We are now going to save the current Workspace. Go to File → Save Workspace... →ṘData → Save

3. In the R Console type
   $> q()$

4. You will be asked if you want to save your workspace image to which you should answer "yes".

5. Now we will re open the workspace we have just saved to our working directory. Locate the file .RData that you have just saved and double click on it. You will see that the workspace you have just saved opens up in R.

1.2 Editing Commands in a text file and R

Now we will practise opening a text file with some R commands in it and pasting those commands into R to run.

1. Locate the file "Hello World.txt" on Wattle. Click on the link and open it up.

2. Now copy the contents of the file and paste it into the R window

3. Now type `"hello()"` at the command prompt >

Now, you're probably saying to yourself, "Hello, world!" is pretty boring, so now we will attempt to change the output in two different ways. The first by editing the text in "Hello World.txt" and the second by editing in the R window.

It's easier to edit commands in a text file than in the R window. While one can type R commands one line at a time directly into the R console this is time consuming and very prone to errors and pulling your hair out in frustration. So instead most users type R commands into a text editor, and save the text file. The commands can be easily copied and pasted from the saved text file into R. We will be using notepad in this example.

We want to copy and paste the line `hello<-function() cat("Hello, world!")` into a new text file so that we can edit it.

1. Open up notepad by going to Start → All Programs → Accessories → Notepad
2. Copy and paste the line `hello<-function() cat("Hello, world!")` into the notepad window
3. Save the text file as: `"Hello Me.txt"` to your working directory
4. Edit the line `hello<-function() cat("Hello, world!")` by replacing the word "world" with your name. Copy the text and past it into *R*.
5. Now type `"hello()"` at the command prompt >

You can use the arrow keys on the keyboard to scroll back to previous commands. You can also edit commands this way.

1. In *R*, press the up arrow once.
2. Use the left arrow to move back through the command 5 spaces. Then delete your name. Now type whatever you feel like typing
3. Press Enter
4. Now type `"hello()"` at the command prompt >

1.3 Printing and Saving

1. Locate the file "Worksheet1.txt" on Wattle. Click on the link and open it up.
2. Now copy the contents of of the first five lines of the file and paste it into the *R* window

A new window should have appeared with a graphical display in it. This is a plot of two variables. Second, the raw data and a statistical summary should have appeared in the *R* window. The output from the *R* functions is longer than the *R* window and is therefore partly obscured. To view the rest of the output either resize the window or use the scrollbar.

You will often want to save both text and graphical displays and produce hardcopy output.

The different types of output can be best done in the following way:

1.3.1 Graphics

1. Click in the graph window.
2. Go to `File` and choose `print`. This will print your plot to the printer connected to the PC you are currently working on
3. if you need to copy and paste your plot directly into a word document, you can right click in the graph window, select "copy as bitmap" and then paste directly into your word document.

1.3.2 Saving commands and output from the R-Console

Now attempt to execute line 7 from the file *worksheet1.s*, by copying it from the file "worksheet1.txt" that you should have open and pasting it into the R window (the Console).

A syntax error occurs, The correct line should be `plot(x*x,y)`

The problem is that there is an extra "(" in line 7 of the file that is causing this error. To fix it we will:

· edit the file to correct it by removing the extra "(".

· save the file.

· copy and paste the correct line to the R window. Syntax errors occur regularly in computing, so it is convenient if you type commands into a text file and then copy them to *R*. Errors can then be easily fixed, and there is no need to retype long commands.

You may wish to save the commands and output in the R-window with the commands in it (the Console) for use at a later date.

1. Open *R* → Start → All Programs → Accessories → Notepad
2. Select the output you wish to save or print and copy and paste it to the empty text document
3. Save the file to your working directory by selecting `File` → `Save As`. Name the file "worksheet1"

1.3.3 Deleting objects from the memory

To see what data, variables etc. are loaded in R type a simple command: $> ls()$

This lists the variables in memory. R holds all objects in memory, and there are limits based on the amount of memory that can be used by all objects. If we don't need to use this memory we should delete the objects we no longer need.

In Windows you can list all the "objects" in memory from the Misc menu on the GUI toolbar.

To delete objects in memory, we use the function rm: $rm(x)$ deletes the object x, $rm(x, y)$ deletes both the objects x et y, $rm(list = ls())$ deletes all the objects in memory

1. Type $rm(list = ls())$ to remove all the objects you have created during this worksheet from the memory

You have now finished your first worksheet. Before you leave you should quit R by using the R function `q()`. Don't forget to log out!