An Introduction to the R Software for Stat 371

R is powerful software for interacting with data. With R, you can create sophisticated graphs, carryout statistical analyses, and create and run simulations. R is also a programming language with an extensive set of built-in functions so you can write your own code to build your own statistical tools. Advanced users can even incorporate functions written in other languages, such as C, C++, and Fortran.

Accessing R

I will assume that you will be using R with WINDOWS. (It can also be used with MACs and UNIX machines.)

(a) Download: Advisable only if you have a fast internet connection (a direct campus connection, cable modem, or DSL). Go the R homepage at **http://cran.us.r-project.org/** . Click on the link **Windows (95 and later)**, then click on the link **base/**, and then click on **rw1062.exe** which begins the download. After the download is complete, double click on the downloaded file and follow the installation instructions.

(b) The CALS Computer Lab: The CALS Lab is in the basement of the Animal Sciences Building and has its own entrance on the south side of the building. There is always a student consultant on duty. Managers, Peter Crump and Tom Tabone, can be found in Room 148 and Room 152, respectively, between 8am and 4:30pm. Do not hesitate to ask any of these individuals for assistance. Although some of the consultants will not know much about the details of R, all will be able to help you use the machines, print results, etc.
The CALS Computer Lab is open: M-Th: 8am-10pm, Fri: 8am-5pm, Sat: 10am-5pm, Sun: 12pm-9pm

A First Session with R

Once R is launched, it will open with a command window with a prompt (>) that awaits your first command. R is a command line program. You interact with the software by typing in commands. We will demonstrate a few key R commands using the milk yield data from class. In this case, you will need to enter the data. You need to give the file a working name; for purposes here, let us choose myield. Then type:

myield <- c(44, 55, 37, 32, 37, 26, 23, 41, 34, 19, 30, 39, 46, 44)

The symbol `<-', a less than sign followed immediately without a space by a hyphen, looks like an arrow. It is the assignment operator and creates an object with the name on the left of the <- whose value is the evaluation of the remainder of the command.   [[Warning: if you type a '(' and then do not complete the command by typing a ')', R will continue to wait for the command to be completed and show a string of `+' prompts even if you continue to press [Enter]. If you get in trouble, press [Esc], to get back to the prompt.]]

Now you can perform some manipulations. To see the list of data, just type **myield**. To see a stem-leaf display of the data, type **stem (myield)**. To obtain the mean, type **mean(myield)** and to obtain the standard deviation, type **sd(myield)**. Remember to quit your session when you are done. You can quit from the **File menu** or by typing q() in the command window at the prompt >.

Getting Help with R

You can access the help by typing the command help.start(). In addition, the Windows version has a Help menu. You can get help on a specific function by typing **?function-name** at the prompt. For example, **?hist** provides many more details on how to use hist using all of its available options.

Printing

The easiest way to get hard copy is to cut-and-paste that portion of the R output of interest into an editor of some kind. A Word document will work just fine for this.

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