Lab 1: Intro to R

January 17-18, 2017

Disclaimer: YOU DO NOT ACTUALLY NEED R FOR THIS COURSE.

It's just free/convenient and handy. So we're teaching you how to use it.

Interface: What you're looking at

Look for RStudio in the start menu, and go ahead and open it up.
The first thing you'll want to do is go to File -> New File -> RScript.
This will open a window on the top left of your screen in RStudio where you'll be doing all of your work.
You'll now have four windows open in RStudio:
1. Script (top left)
2. Console (bottom left)
3. Variables (top right)
4. Graphs/Help/Stuff (bottom right)

Note: To actually run code, type it in the script, then highlight it and hit Ctrl-Enter to send it to the console to run.

Basics: R is a really fancy calculator.

```
4 + 6 - (24/6)
```

```
## [1] 6
```

```
(6 - 4) * 3
```

```
## [1] 6
```

```
5 ^ 2
```

```
## [1] 25
```

Functions you actually have to type in:

```
exp(2) # This is the number e (think natural logs) raised to the power inside the parentheses
```

```
## [1] 7.389056
```

```
sqrt(4)
```

```
## [1] 2
```

```r
log(10) # This is log base e. For log base 10, the function is log10().
```

```
## [1] 2.302585
```

```r
abs(-5) # Absolute value
```

```
## [1] 5
```

Sequences

Creating a sequence:

```r
1:5 # Creates a sequence from 1 to 5
```

```
## [1] 1 2 3 4 5
```

```r
seq(from=1,to=5,by=1) # Does the exact same thing
```

```
## [1] 1 2 3 4 5
```

Math with sequences:

```r
1:5 + 5
```

```
## [1]  6  7  8  9 10
```

```r
1:5 * 2
```

```
## [1]  2  4  6  8 10
```

Storing Variables

Watch this:

```r
x <- 5 # I just told R that x is now 5.
# Now when I say x, R substitutes in 5.
x
```

```
## [1] 5
```

```r
# This is handy for things like
log(5) + 3/2 -> y # Note that the arrow goes both ways and assigns in the direction of the arrow.
y
```

```
## [1] 3.109438
```

Also note that R is case-sensitive, so X would be different from x.
You can store sequences as variables too. These types of variables are called *vectors*.

Reading in Data

All of the datasets for this class will be on the class website, and can be read in using the URL:

```
todays.data<-read.delim("http://myweb.uiowa.edu/pbreheny/data/titanic.txt")
```

Some basic things you can do with datasets:
(To be elaborated upon as needed throughout the semester)

```
head(todays.data)
```

```
##   Class  Sex   Age Survived
## 1   3rd Male Child     Died
## 2   3rd Male Child     Died
## 3   3rd Male Child     Died
## 4   3rd Male Child     Died
## 5   3rd Male Child     Died
## 6   3rd Male Child     Died
```

```
summary(todays.data)
```

```
##   Class         Sex          Age           Survived
##  1st :325   Female: 470   Adult:2092   Died    :1490
##  2nd :285   Male  :1731   Child: 109   Survived: 711
##  3rd :706
##  Crew:885
```

Help

To access the help documentation on a function you're not sure about, type a question mark before the function. For example, try typing ?seq

Practice questions (Not for any sort of grade)

Problem 1

Part a
Create a sequence from 25 to 425 in increments of 25.

Part b
Set Part a to variable named partB.

Part c
Divide the sequence by 25 using the variable created in Part b.

Part d
Take the square root of the sequence using the variable created in Part b.

What you should get upon running your code:

```
Part a
 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425
Part b
 Stores internally, doesn't print
Part c
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Part d
 5 7.071068 8.660254 10 11.18034 12.24745 13.22876 14.14214 15 15.81139 16.58312 17.32051 18.02776 18.7
```