DA 320 Project 10 M. Blanco

**Part 1**: Install R and complete the tutorials in ***R Installation Guide*** file.

**Part 2**: Complete the tutorial lab [https://web.stanford.edu/class/stats101/intro/introlab01.html](https://web.stanford.edu/class/stats101/intro/intro-lab01.html) Attach your R commands and results.

**Part 3**: Reproduce the memory usage information as in Code Listing 11.1. Specifically:

1. What’s the largest integer value supported using the .Machine variable on your local machine?

> .Machine$integer.max

[1] 2147483647

1. Print the garbage collector report on your R environment using verbose mode.

> gc(verbose = T)

Garbage collection 94 = 59+17+18 (level 2) ...

177.3 Mbytes of cons cells used (58%)

42.6 Mbytes of vectors used (66%)

used (Mb) gc trigger (Mb) max used (Mb)

Ncells 3319518 177.3 5684620 303.6 4703850 251.3

Vcells 5579683 42.6 8415273 64.3 8403528 64.2

1. Initialize a 5x5 matrix in R. Use object.size to report the number of bytes used by the matrix object you created.

> example\_matrix <- matrix(1:25, nrow = 5, ncol = 5)

> object.size(example\_matrix)

328 bytes

> example\_matrix <- matrix(1:10000000, nrow = 1000, ncol = 1000)

> object.size(example\_matrix)

4000200 bytes

1. Multiply the matrix you created by itself using R. Use system.time to report the time it takes to run this manipulation.

> system.time(example\_matrix %\*% example\_matrix)

user system elapsed

0 0 0

> system.time(example\_matrix %\*% example\_matrix %\*% example\_matrix)

user system elapsed

0 0 0

> system.time(example\_matrix %\*% example\_matrix %\*% example\_matrix %\*% example\_matrix)

user system elapsed

0 0 0

> system.time(example\_matrix %\*% example\_matrix)

user system elapsed

0.45 0.00 0.46

> system.time(example\_matrix %\*% example\_matrix %\*% example\_matrix)

user system elapsed

1.02 0.03 1.03

> system.time(example\_matrix %\*% example\_matrix %\*% example\_matrix %\*% example\_matrix)

user system elapsed

1.44 0.02 1.45

Attach your R commands and results.