**Stat 6045 Home Work 1**

1. Generate the following sequences and matrices

(a) 1*,* 3*,* 5*,* 7*, . . .,* 21.

(b) 50*,* 47*,* 44*, . . .,* 14*,* 11.

(c) 1*,* 2*,* 4*,* 8*, . . . ,*1024.

(d)

1. a. Create a 10 *×* 11 matrix of any numbers; call it *A.*
2. How would you find the maximum entry in each row of *A*?
3. Calculate the standard deviation of each column of A (the command you need is sd()).
4. Select the last column of A, and call it b. Then remove the last column from the original A. Do this using the function ncol().
5. Solve the system of linear equations *Ax* = *b*.
6. Find a vector containing the sums of each row of A.

Can you think of (or find) any other ways of achieving this?

1. Create a second matrix B, where the *i*th column of B is the sum of the first *i* columns of A.
2. Create a diagonal matrix whose diagonal entries 1, ½, 1/3…, 1/10.
3. R has a built-in character vector of US State names, state.name. Use this character vector and R’s character functions to answer the following questions.
4. List all the US State names that are more than one word. How many are there?
5. What is the longest US State name(s) (including spaces) and how long is it?
6. What is the longest single word US State name and how long is it?
7. List all the US State names, where all of the upper and lower case “a”s are replaced with a capital “Z”.
8. Mrs. Smith is participating in a clinical trial. She started treatment on March 3, 1999 and is expected to have a follow-up visit every 6-months for the next three years.
9. Create a vector of the dates when Mrs. Smith is expected to show up for her follow-up visit.
10. Mrs. Smith showed up on the following dates, enter these dates into R as Date objects.

9/10/1999, 2/10/2000, 9/16/2000, 2/23/2001, 9/9/2001 3/28/2002

1. It is unrealistic to expect Mrs. Smith to show up on the dates from part (a).

However, did Mrs. Smith have a follow-up appointment within three weeks of each expected follow-up date?