

**STAT 40001/MA 59800   Statistical Computing/ Computational Statistics   Fall 2013**  
**Homework 1**

Due : September 5, 2013

Name:

PUID:

*Instruction: Please submit your R code along with a brief write-up of the solutions (do not submit raw output). Some of the questions below can be answered with very little or no programming. However, write code that outputs the final answer and does not require any additional paper calculations. For example, suppose I ask for how many numbers are greater than 5 in the vector,  $x=c(1,9,2,8,10,12)$ . Do not simply count the number of **TRUE**s by hand, instead let the R count the number of **TRUE**s by coding **sum** ( $x > 5$ ).*

**Q.N. 1)** Calculate the following numerical results to the three decimal places

- a)  $(7 - 8) + 5^3 - 5 \div 6 + \sqrt{62}$
- b)  $\ln 3 + \sqrt{2} \sin(\pi) - e^3$
- c)  $2 \times (5 + 3) - \sqrt{6} + 9^2$
- d)  $\ln 5 - \exp(2) + 2^3$
- e)  $(9 \div 2) \times 4 - \sqrt{10} + \ln 6 - \exp(1)$
- f)  $\log 14 + \ln 14$

**Q.N. 2)** Create the following vectors using **rep** function:

V1= 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5

V2= 1 1 1 1 2 2 2 2 3 3 3 3 4 4 4 4 5 5 5 5

V3= Math Math Biology Biology Biology Statistics Statistics Statistics Statistics

**Q.N. 3)** Test scores of Fifteen students in Test 1 and Test 2 are presented below

S.N.	Test 1	Test2
1	56	86
2	78	67
3	87	78
4	89	89
5	95	87
6	98	67
7	NA	94
8	78	78
9	87	81
10	98	83
11	54	78
12	89	NA
13	78	93
14	98	98
15	97	100

- a) How many students have their test 1 score greater than 80 ?
- b) How many students have their test 2 score greater than 85 ?

- c) Did all fifteen students take both tests?
- d) How many students did better in the second test than the first test?
- e) How many students have the same score in the first and second test?
- f) Calculate the class average of both test 1 and test 2.

**Q.N. 4)** Create the following matrix (M) with the column and row names (Note that the numbers are in sequence from 1 to 20)

```
>M
      column-1 column-2 column-3 column-4 column-5
Experimet.1      1      5      9     13     17
Experimet.2      2      6     10     14     18
Experimet.3      3      7     11     15     19
Experimet.4      4      8     12     16     20
```

- a) Determine the dimension of the matrix M
- b) Select the first two row of the matrix M
- c) Calculate the sum of all columns of the matrix M
- d) Calculate the sum of all rows of the matrix M
- e) Use “sample” to shuffle the elements of each row of the matrix M

**Q.N. 5)** Solve the system of equations

$$2x + 3y = 21$$

$$3x - 4y = 23$$