Simulation Lab

<u>**Assignment-** 2</u>

Solve all the questions

Problem 1. $A = \begin{pmatrix} 3 & -2 & 1 \\ -1 & 4 & -2 \end{pmatrix}$ *and* $B = \begin{pmatrix} -7 & 4 \\ 9 & 5 \\ 2 & -1 \end{pmatrix}$

(i) *Find matrix-matrix multiplication* (AB)

(ii) *Find* $(AB)^t$ *and* $(AB)^{-1}$

(iii) *Find the mean, standard deviation for each column and row for the matrices* $A,B,AB,(AB)^t,(AB)^{-1}$.

   Description: *Here you are not supposed to use R packages. It means that for the calculation of matrix-matrix multiplication you cannot use* $\% * \%$. *Here you can use only* $*, +, -, /$. *So, write your own code for these computations and verify these with the solution of assignment 1 (question number 4). Better if you provide a* "*function*" *program for that.*

Problem 2. *Write a* "*function*" *program in R to find n!. Hence find* $13!, 32!$. *Do not name the function by* "*factorial*". *You can initialize that* $0! = 1$ *and* $1! = 1$.

Problem 3. *Write a* "*function*" *program in R to find maximum and minimum from a set of numbers. Do not name the function by* "*max*" *or* "*min*". *As an input you take* $(-4, 44.7, -2, 40, 54, 1, -3, 4)$

Problem 4. *Write a* "*function*" *program in R to sort for the above set in an increasing order . Do not name the function by* "*sort*".

Problem 5. *Write a* "*function*" *program in R to check whether a number prime or composite. Do not use any default function.*

Problem 6. *Write a* "*function*" *program in R to compute* Γ *function. Do not name the function by* "*gamma*". *As an input you take* $8, 2, 25, \frac{3}{2}$. *You can initialize* $\Gamma(\frac{1}{2}) = \sqrt{\pi}, \Gamma(1) = 1$. *You can use* $\Gamma(x+1) = x\Gamma(x)$

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