

Programming Fundamentals LAB – BSDSF21

(Both Morning and Afternoon)

Lab 10 – 14-04-2022

YOU may USE Command Prompt to interpret and execute all the PYTHON programs. Use of any IDE, except **Mu Editor** is not allowed for this LAB, despite you are expert. Unless and until you convinced me in personal capacity.

You are provided reasonably sufficient code for Matrices manipulation. It is using a 2D Array to store the matrix data. The UDT Matrix class and following companion functions are provided in the code along with the main function. The main function logic demonstrates the creation of Matrices and some basic manipulation.

```
def createMatrix(rows, cols): # return a null matrix of order rows X cols
def inputMatrix(m):          # populate matrix m with data taken from user, in a way
def printMatrix(m):          # output matrix in parameter m
def transposeMatrix(m):      # create and return transpose of matrix m
def addMatrices(m1, m2):     # create and return sum of two matrices m1 and m2
def isSymmetric(m):          # return true or false for matrix m is symmetric or not
```

1. You have write your own code to test the above functions in the main functions. If in a function there is an error, correct it.
2. Write the code for the following functions related to the matrix class and test the code.

```
def isSquareMatrix(m):       # return true or false for matrix m is square or not
def createIdentityMatrix(rows, cols): # return an IDENTITY matrix of order rows X cols
def subtractMatrices(m1, m2):    # create and return matrix as m1 - m2
def multiplyMatrices(m1, m2):    # create and return matrix as m1 · m2
```

3. Import a function named **randint** from module named **random**. The call **randint(a, b)** returns a random number between integers **a** and **b**, provided **a < b**. Write the code to create a 3D array of size 4 X 9 X 7. Later using three nested loops, populate the whole array with random numbers between 11 and 99. Later output the data in above array in the form of 4 stacked 2D arrays of size 9 X 7.

Thanks, for your patience