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https://github.com/nitrogen404/Semester-5/blob/master/TC1/Labs/Lab%202/additionMatrix.py
https://github.com/nitrogen404/Semester-5/blob/master/TC1/Labs/Lab%202/transpose.py

Track Elevative
Lab - 2

Aim: To find the sum of two matrices and transpose of a matrix

Tools: Python

Theory: As long as the dimensions of two matrices are the same, we can add and subtract them much like we add and subtract numbers.

The transpose of a matrix is obtained by changing its rows into columns and its columns into rows.

$$\mathbf{A}+\mathbf{B}=\begin{bmatrix}4 & 8\\ 3 & 7\end{bmatrix}+\begin{bmatrix}1 & 0\\ 5 & 2\end{bmatrix}$$

$$=\begin{bmatrix}4+1 & 8+0\\ 3+5 & 7+2\end{bmatrix}$$

$$=\begin{bmatrix}5 & 8\\ 8 & 9\end{bmatrix}$$

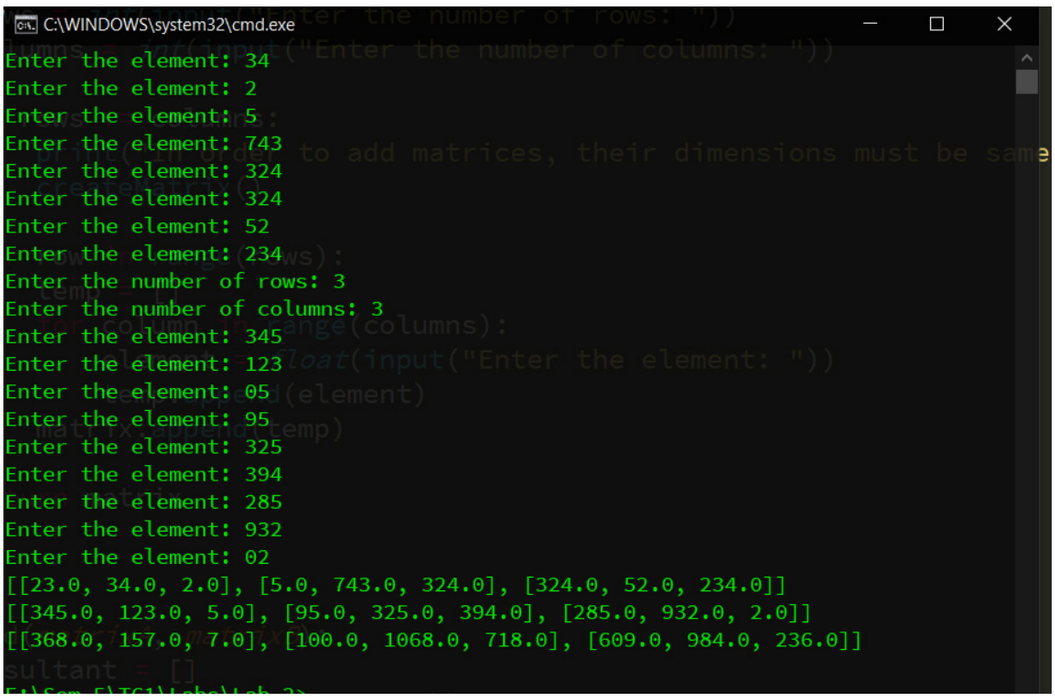
Addition of matrices

$$A=\begin{bmatrix}a & b & c\\ d & e & f\end{bmatrix}_{2\times 3} \qquad A^{T}=\begin{bmatrix}a & d\\ b & e\\ c & f\end{bmatrix}_{3\times 2}$$

Transpose of a matrix

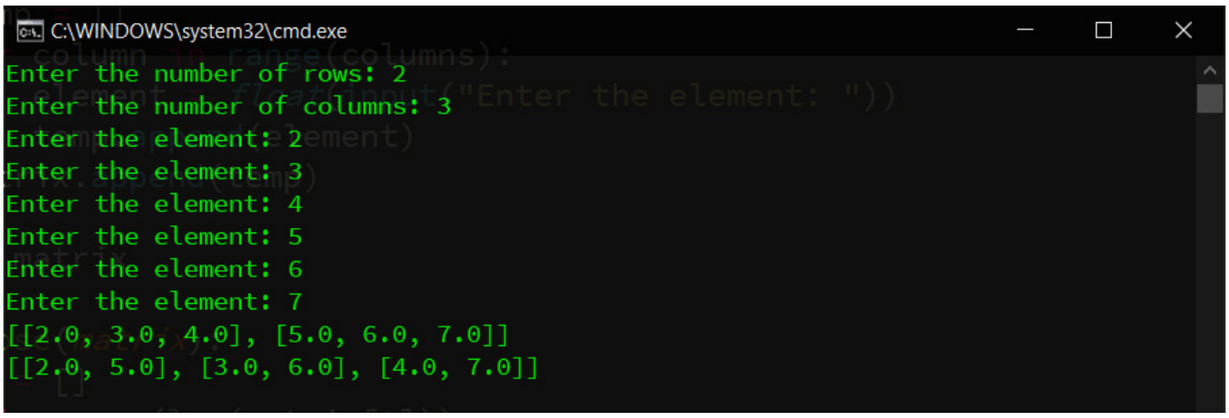
Code:

```
# addition of two matrices
import pprint
pp = pprint.PrettyPrinter(indent=4)

def createMatrix():
    matrix = []
    rows = int(input(“Enter the number of rows: “))
    columns = int(input(“Enter the number of columns: “))

    if rows != columns:
        print(“In order to add matrices, their dimensions
              must be same”)
        createMatrix()

    for row in range(rows):
        temp = []
        for column in range(columns):
            element = float(input(“Enter the element: “))
            temp.append(element)
        matrix.append(temp)

    return matrix



def add(matrixA, matrixB):
    resultant = []
    for row in range(len(matrixA)):
        temp = []
        for i in range(len(matrixA[row])):
            temp.append(matrixA[row][i] + matrixB[row][i])
        resultant.append(temp)

    return resultant

matrixA = createMatrix()
matrixB = createMatrix()
pp.pprint(matrixA)
pp.pprint(matrixB)
```



Addition of two matrices

```
# transpose of a matrix
def createMatrix():
    matrix = []
    rows = int(input(“Enter the number of rows: “))
    columns = int(input(“Enter the number of columns: “))

    for row in range(rows):
        temp = []
        for column in range(columns):
            element = float(input(“Enter the element: “))
            temp.append(element)
        matrix.append(temp)

    return matrix

def transpose(matrix):
    result = []
    for i in range(len(matrix[0])):
        temp = [0] * len(matrix)
        result.append(temp)

    for i in range(len(matrix)):
        for j in range(len(matrix[0])):
            result[j][i] = matrix[i][j]

    return result


matrix = createMatrix()
print(matrix)
transpose = transpose(matrix)
print(transpose)
```



Addition of two matrices

Conclusion:

Studied the addition and transpose properties and rules of a matrix. Implemented the same in python.