

## CHANDAN DHAMADE

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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.

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

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

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

Addition of matrices

$$\mathbf{A} + \mathbf{B} = \begin{bmatrix} 4 & 8 \\ 3 & 7 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 5 & 2 \end{bmatrix} \qquad \mathbf{A} = \begin{bmatrix} \mathbf{a} & \mathbf{b} & \mathbf{c} \\ \mathbf{d} & \mathbf{e} & \mathbf{f} \end{bmatrix}_{2 \times 3} \qquad \mathbf{A}^{\mathsf{T}} = \begin{bmatrix} \mathbf{a} & \mathsf{d} \\ \mathbf{b} & \mathbf{e} \\ \mathbf{c} & \mathbf{f} \end{bmatrix}_{3 \times 2}$$

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)
```

```
Enter the element: 34 ("Enter the number of columns: "))

Enter the element: 34 ("Enter the number of columns: "))

Enter the element: 2

Enter the element: 743

Enter the element: 324

Enter the element: 324

Enter the element: 324

Enter the element: 52

Enter the element: 634

Enter the element: 1234

Enter the number of columns: 3

Enter the number of columns: 3

Enter the element: 345

Enter the element: 123/0at(input("Enter the element: "))

Enter the element: 95 (element)

Enter the element: 95

Enter the element: 325

Enter the element: 394

Enter the element: 285

Enter the element: 932

Enter the element: 932

Enter the element: 02

[[33.0, 34.0, 2.0], [5.0, 743.0, 324.0], [324.0, 52.0, 234.0]]

[[345.0, 123.0, 5.0], [95.0, 325.0, 394.0], [285.0, 932.0, 2.0]]

[[368.0, 157.0, 7.0], [100.0, 1068.0, 718.0], [609.0, 984.0, 236.0]]

Enter the element: 71714 behalves as
```

## 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)
```

```
Enter the number of rows: 2
Enter the number of columns: 3 "Enter the element: ")
Enter the element: 2 ement
Enter the element: 4
Enter the element: 5
Enter the element: 6
Enter the element: 7
[[2.0, 3.0, 4.0], [5.0, 6.0, 7.0]]
[[2.0, 5.0], [3.0, 6.0], [4.0, 7.0]]
```

Addition of two matrices

## **Conclusion:**

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