

Fundamentals of AI & ML  
Monsoon Semester V 2021-22

**Lab - 2**

Date: 23 September 2021

**Topic: Linear Algebra**

---

## AIM

- Write a python program to Add Two Matrices.
- Write a python program to Transpose a Matrix.

## THEORY

Matrix addition is the operation of adding two matrices by adding the corresponding entries together.

The transpose of a matrix is **obtained by changing its rows into columns and its columns into rows**. A rectangular array of numbers or functions that are arranged in the form of rows and columns is called a matrix. ... And this new matrix is denoted as  $A^T$ , which is the transpose of the given matrix A.

## PROGRAM CODE

```
# Program to add two matrices using nested loop

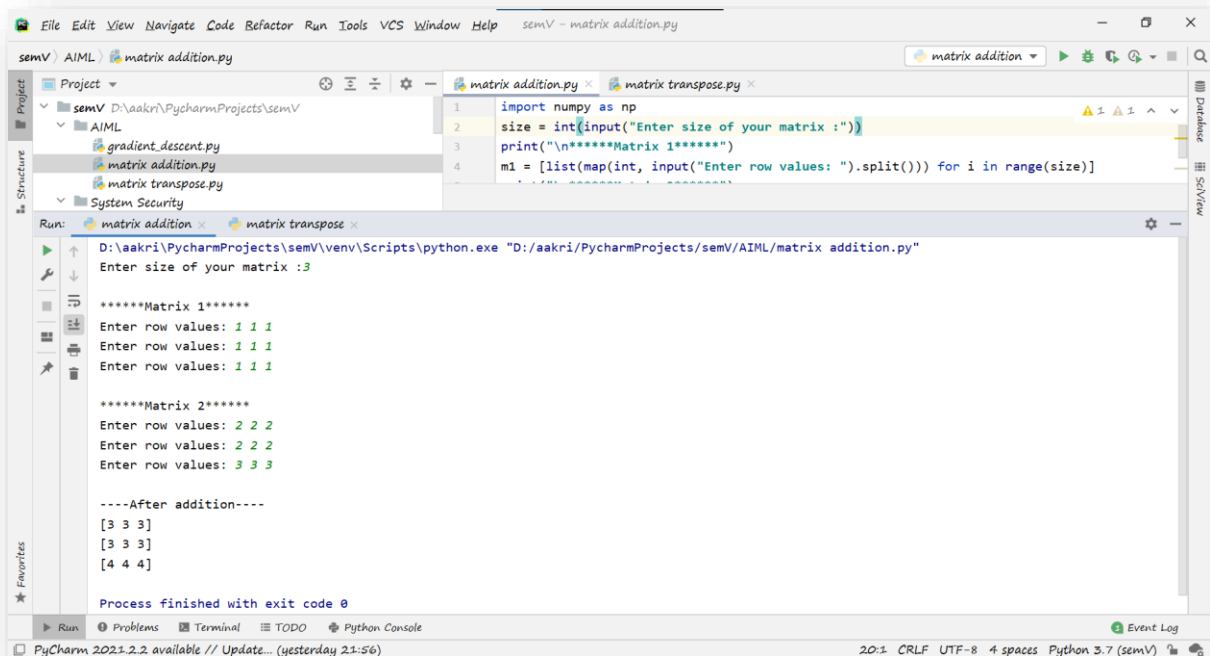
import numpy as np
size = int(input("Enter size of your matrix :"))
print("\n*****Matrix 1*****")
m1 = [list(map(int, input("Enter row values: ").split())) for i in range(size)]
print("\n*****Matrix 2*****")
m2 = [list(map(int, input("Enter row values: ").split())) for i in range(size)]
m1 = np.array(m1)
m2 = np.array(m2)
m3 = []
for i in range(size):
    temp = []
    for j in range(size):
        temp.append(m1[i][j]+m2[i][j])
    m3.append(np.array(temp))
m3 = np.array(m3)
print("\n-----After addition-----")
```

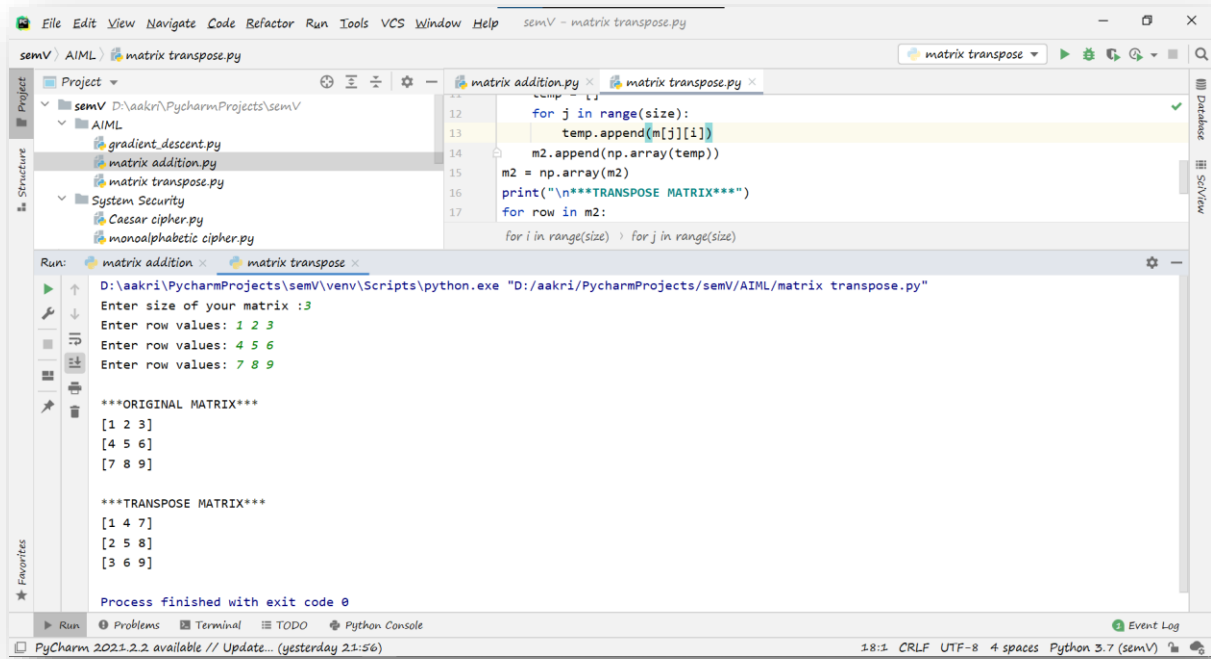
```
for row in m3:  
    print(row)
```

# Program to find transpose of a matrix

```
import numpy as np  
size = int(input("Enter size of your matrix :"))  
mat = [list(map(int, input("Enter row values: ").split())) for i in  
range(size)]  
m = np.array(mat) # NUMPY ARRAY  
print("\n***ORIGINAL MATRIX***")  
for row in m:  
    print(row)  
m2 = []  
for i in range(size):  
    temp = []  
    for j in range(size):  
        temp.append(m[j][i])  
    m2.append(np.array(temp))  
m2 = np.array(m2)  
print("\n***TRANPOSE MATRIX***")  
for row in m2:  
    print(row)
```

## OUTPUT





```
File Edit View Navigate Code Refactor Run Tools VCS Window Help semV - matrix transpose.py
semV AIML matrix transpose.py
Project
  semV D:\aakri\PycharmProjects\semV
  AIML
    gradient_descent.py
    matrix addition.py
    matrix transpose.py
  System Security
    Caesar cipher.py
    monoalphabetic cipher.py
Structure
  matrix addition.py
  matrix transpose.py
Run: matrix addition matrix transpose
D:\aakri\PycharmProjects\semV\venv\Scripts\python.exe "D:/aakri/PycharmProjects/semV/AIML/matrix transpose.py"
Enter size of your matrix :3
Enter row values: 1 2 3
Enter row values: 4 5 6
Enter row values: 7 8 9

***ORIGINAL MATRIX***
[1 2 3]
[4 5 6]
[7 8 9]

***TRANSPOSE MATRIX***
[1 4 7]
[2 5 8]
[3 6 9]

Process finished with exit code 0
PyCharm 2021.2.2 available // Update... (yesterday 21:56) 18:1 CRLF UTF-8 4 spaces Python 3.7 (semV) Event Log
```

## CONCLUSION

Matrix addition and transpose was performed using Python.