Modern Education Society's

College of Engineering, Pune

NAME OF STUDENT: Sandesh Santosh Pabitwar CLASS: Comp A	
SEMESTER/YEAR: III sem	**ROLL NO: F20111040**
DATE OF PERFORMANCE:	**DATE OF SUBMISSION:19/11/2021**
EXAMINED BY:Prof.Amol Dhawale	**EXPERIMENT NO: DSL A-09**

TITLE : PERFORM VARIOUS OPERATIONS ON MATRICES

PROBLEM STATEMENT: Write a **Python** program to compute following computation on matrix:

a) Addition of two matrices B) Subtraction of two matrices

c) Multiplication of two matrices d) Transpose of a matrix

OBJECTIVES:

1. To understand structure of 2DArray.
2. To understand how to Create, Display and perform various operations on 2D array.

OUTCOMES:

1. To analyze the problems to apply suitable algorithm and data structure.
2. To understand concept of multi-dimensional array.

PRE-REQUISITES:

1. Knowledge of python programming
2. Knowledge of 2D array and matrix operations.

APPARATUS:

QUESTIONS:

1. What is sparse matrix? Explain with example.

2. Write algorithm to perform fast transpose on sparse matrix.

```python
# all operations are for 3*3 matrix
print('enter elements of matrix one')
a = list(map(int, input().split()))
b = list(map(int, input().split()))
c = list(map(int, input().split()))
print('enter elements of second matrix')
d = list(map(int, input().split()))
e = list(map(int, input().split()))
f = list(map(int, input().split()))
m1 = [a, b, c]
m2 = [d, e, f]
m3 = [[0, 0, 0], [0, 0, 0], [0, 0, 0]]  # empty matrix to hold output


def addition(m1, m2):
    for i in range(3):
        for j in range(3):
            m3[i][j] = m1[i][j] + m2[i][j]

    print('addition matrix')
    print(m3)


addition(m1, m2)


def substraction(m1, m2):
    for i in range(3):
        for j in range(3):
            m3[i][j] = m1[i][j] - m2[i][j]

    print(m3)
substraction(m1, m2)


def transpose(m1):
    for i in range(3):
        for j in range(3):
            m3[i][j] = m1[j][i]

    print('transpose of m1')
    print(m3)


transpose(m1)


def multiplication(m1, m2):
    # iterating by row of m1
    for i in range(3):

        # iterating by column by m2
        for j in range(3):

            # iterating by rows of m2
            for k in range(3):
                m3[i][j] += m1[i][k] * m2[k][j]
    print('multiplication of two matrix is:')
    print(m3)

multiplication(m1, m2)
```

Output:

```
C:\Users\sspab\PycharmProjects\new\venv\Scripts\python.exe
enter elements of matrix one
1 2 3
4 5 6
7 8 9
enter elements of second matrix
2 4 6
6 7 8
5 6 7
addition matrix
[[3, 6, 9], [10, 12, 14], [12, 14, 16]]
subtraction matrix
[[-1, -2, -3], [-2, -2, -2], [2, 2, 2]]
transpose of m1
[[1, 4, 7], [2, 5, 8], [3, 6, 9]]
multiplication of two matrix is:
[[30, 40, 50], [70, 92, 114], [110, 144, 178]]

Process finished with exit code 0
```