Practical Ques. P11

#11. Perform vectorized implementation of simple matrix operation like finding the transpose of

#a matrix, adding, subtracting or multiplying two matrices.

```
import numpy as np

matrix1 = np.array([[1, 2, 3],
                    [4, 5, 6]])


matrix2 = np.array([[7, 8, 9],
                    [10, 11, 12]])
transpose_matrix1 = np.transpose(matrix1)


# Adding two matrices
sum_matrix = matrix1 + matrix2


# Subtracting two matrices
difference_matrix = matrix1 - matrix2


# Multiplying two matrices (element-wise multiplication)
product_matrix = matrix1 * matrix2


# Multiplying two matrices (matrix multiplication)
dot_product_matrix = np.dot(matrix1, np.transpose(matrix2))


# Printing the results
print("Original Matrix 1:")
```

```
print(matrix1)

print("\nTranspose of Matrix 1:")
print(transpose_matrix1)

print("\nMatrix 2:")
print(matrix2)

print("\nSum of Matrix 1 and Matrix 2:")
print(sum_matrix)

print("\nDifference of Matrix 1 and Matrix 2:")
print(difference_matrix)

print("\nElement-wise Product of Matrix 1 and Matrix 2:")
print(product_matrix)

print("\nMatrix Multiplication of Matrix 1 and Transpose of Matrix 2:")
print(dot_product_matrix)
```

```
Original Matrix 1:
[[1 2 3]
 [4 5 6]]

Transpose of Matrix 1:
[[1 4]
 [2 5]
 [3 6]]

Matrix 2:
[[ 7  8  9]
 [10 11 12]]

Sum of Matrix 1 and Matrix 2:
[[ 8 10 12]
 [14 16 18]]

Difference of Matrix 1 and Matrix 2:
[[-6 -6 -6]
 [-6 -6 -6]]

Element-wise Product of Matrix 1 and Matrix 2:
[[ 7 16 27]
 [40 55 72]]

Matrix Multiplication of Matrix 1 and Transpose of Matrix 2:
[[ 50  68]
 [122 167]]
```