Practical 2

Aim: Write a python program to perform 3x3 Matrix multiplication

Code:

```
x = [[1,2,3],[4,5,6],[7,8,9,]]
y = [[1,2,3],[4,5,6],[7,8,9,]]

result = [[0,0,0],[0,0,0],[0,0,0]]

for i in range(len(x)):
    for j in range(len(y[0])):
        for k in range(len(y)):
            result[i][j] += x[i][k] * y[k][j]

for r in result:
    print(r)
```

OR

```
def MatrixOutput(matrix):
    for row in matrix:
        print(row)

def Matrix():
    row = int(input("How many rows do you want: "))
    col = int(input("How many columns do you want: "))
    matrix = [[int(input(f"Enter value for [{i}][{j}] index: "))
    for j in range(col)] for i in range(row)]
    MatrixOutput(matrix)
    return matrix

def MatMultiplication(a, b):
    if len(a[0]) != len(b):
        print("Matrix multiplication not possible.")
        return None

    result = [[0 for _ in range(len(b[0]))] for _ in range(len(a))]

    for i in range(len(a)):
        for j in range(len(b[0])):
            for k in range(len(b)):
                result[i][j] += a[i][k] * b[k][j]
```

```
        return result

    print("Matrix multiplication")
    print("\nFor 1st matrix: ")
    a = Matrix()
    print("\nFor 2nd matrix: ")
    b = Matrix()

    result = MatMultiplication(a, b)
    if result:
        print("\nResultant matrix:")
        MatrixOutput(result)
```

1st code output:

```
[30, 36, 42]
[66, 81, 96]
[102, 126, 150]
```

AND

2nd code output:

```
Matrix multiplication

For 1st matrix:
How many rows do you want: 3
How many columns do you want: 3
Enter value for [0][0] index: 1
Enter value for [0][1] index: 2
Enter value for [0][2] index: 3
Enter value for [1][0] index: 4
Enter value for [1][1] index: 5
Enter value for [1][2] index: 6
Enter value for [2][0] index: 7
Enter value for [2][1] index: 8
Enter value for [2][2] index: 9
[1, 2, 3]
[4, 5, 6]
[7, 8, 9]

For 2nd matrix:
How many rows do you want: 3
```

```
How many columns do you want: 3
Enter value for [0][0] index: 1
Enter value for [0][1] index: 2
Enter value for [0][2] index: 3
Enter value for [1][0] index: 4
Enter value for [1][1] index: 5
Enter value for [1][2] index: 6
Enter value for [2][0] index: 7
Enter value for [2][1] index: 8
Enter value for [2][2] index: 9
[1, 2, 3]
[4, 5, 6]
[7, 8, 9]

Resultant matrix:
[30, 36, 42]
[66, 81, 96]
[102, 126, 150]
```