Digital image processing Lab

CEL 444

Lab Journal 1

Name: Zeeshan Ali
Enrollment: 01-134212-197
BSCS – 6B

Department of Computer Science
BAHRIA UNIVERSITY, ISLAMABAD

Task # 1:

Matrix Addition

Write a Python program that adds two matrices provided by the user. The program should ask for the dimensions of the matrices and ensure that they have the same dimensions before performing the addition.

Code:

```python
# Code By Zeeshan Ali
import numpy as np

rows = int(input("Enter the number of rows: "))
cols = int(input("Enter the number of columns: "))

print("Enter the entries for the first matrix:")
matrix1 = np.array([ [int(x) for x in input().split()] for _ in range(rows) ])

print("Enter the entries for the second matrix:")
matrix2 = np.array([ [int(x) for x in input().split()] for _ in range(rows) ])

result = matrix1 + matrix2
print("Resultant Matrix:")
print(result)
```

Output:

```
Enter the number of rows: 2
Enter the number of columns: 2
Enter the entries for the first matrix:
1 2
3 4
Enter the entries for the second matrix:
5 6
6 8
Resultant Matrix:
[[ 6  8]
 [ 9 12]]
```

Task # 2:

Matrix Multiplication

Write a Python program to multiply two matrices provided by the user. The program should check if the number of columns in the first matrix is equal to the number of rows in the second matrix.

Code:

```python
import numpy as np

rows1 = int(input("Enter the number of rows for the first matrix: "))
cols1 = int(input("Enter the number of columns for the first matrix: "))

print("Enter the entries for the first matrix (row-wise):")
matrix1 = np.array([ [int(x) for x in input().split()] for _ in range(rows1) ])

rows2 = int(input("Enter the number of rows for the second matrix: "))
cols2 = int(input("Enter the number of columns for the second matrix: "))

if cols1 != rows2:
    print("Not possible. The number of cols in 1st matrix must be equal to number of rows in 2nd matrix")
else:
    print("Enter the entries for the second matrix (row-wise):")
    matrix2 = np.array([ [int(x) for x in input().split()] for _ in range(rows2) ])

    result = np.dot(matrix1, matrix2)
    print("Resultant Matrix after multiplication:")
    print(result)
```

Output:

```
Enter the number of rows for the first matrix: 2
Enter the number of columns for the first matrix: 2
Enter the entries for the first matrix (row-wise):
1 2
3 4
Enter the number of rows for the second matrix: 2
Enter the number of columns for the second matrix: 2
Enter the entries for the second matrix (row-wise):
1 2
3 4
Resultant Matrix after multiplication:
[[ 7 10]
 [15 22]]
```