MATHS ASSIGNMENT SET2 QUESTION2

AIM:

- DEFINE A MATRIX
- ADD,SUBTRACT,DIVIDE,PRODUCT OF MATRIX

PROGRAM (ADDITON OF 2 VECTORS)

```
# Initialize two 2x2 matrices
arr1 = [[0 for _ in range(2)] for _ in range(2)]
arr2 = [[0 for _ in range(2)] for _ in range(2)]

# Input values for the first matrix
print("Matrix 1 elements:")
for i in range(2):
    for j in range(2):
        while True:
            try:
                arr1[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Input values for the second matrix
print("Matrix 2 elements:")
for i in range(2):
    for j in range(2):
        while True:
            try:
                arr2[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Initialize the result matrix with zeros
arr3 = [[0 for _ in range(2)] for _ in range(2)]

# Perform matrix addition
for i in range(2):
    for j in range(2):
```

```
      arr3[i][j] = arr1[i][j] + arr2[i][j]

# Print the result matrix (matrix addition)
print("Matrix addition result:")
for i in range(2):
   for j in range(2):
      print(arr3[i][j], end="\t")
   print()  # Move to the next row
```
RESULT:

THE PROGRAM HAS RUN AND OUTPUT OBTAINED SUCCESSFULLY

OUTPUT:

```
Matrix 1 elements:
Enter element at row 1, column 1: 1
Enter element at row 1, column 2: 2
Enter element at row 2, column 1: 3
Enter element at row 2, column 2: 4
Matrix 2 elements:
Enter element at row 1, column 1: 5
Enter element at row 1, column 2: 6
Enter element at row 2, column 1: 7
Enter element at row 2, column 2: 8
Matrix addition result:
6       8
10      12
```

PROGRAM(SUBTRACTION OF 2 VECTORS)

```
# Initialize two 2x2 matrices
arr1 = [[0 for _ in range(2)] for _ in range(2)]
arr2 = [[0 for _ in range(2)] for _ in range(2)]

# Input values for the first matrix
print("Matrix 1 elements:")
for i in range(2):
   for j in range(2):
```

```
        while True:
            try:
                arr1[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Input values for the second matrix
print("Matrix 2 elements:")
for i in range(2):
    for j in range(2):
        while True:
            try:
                arr2[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Initialize the result matrix with zeros
arr3 = [[0 for _ in range(2)] for _ in range(2)]

# Perform matrix addition
for i in range(2):
    for j in range(2):
        arr3[i][j] = arr1[i][j]-arr2[i][j]


# Print the result matrix (matrix addition)
print("Matrix subtraction result:")
for i in range(2):
    for j in range(2):
        print(arr3[i][j], end="\t")
    print()  # Move to the next row
```

OUTPUT:

```
Matrix 1 elements:
Enter element at row 1, column 1: 1
Enter element at row 1, column 2: 2
Enter element at row 2, column 1: 3
Enter element at row 2, column 2: 4
Matrix 2 elements:
```

```
Enter element at row 1, column 1: 5
Enter element at row 1, column 2: 6
Enter element at row 2, column 1: 7
Enter element at row 2, column 2: 8
Matrix subtraction result:
-4      -4
-4      -4
```

PROGRAM(DIVISION OF 2 VECTORS):

```
# Initialize two 2x2 matrices
arr1 = [[0 for _ in range(2)] for _ in range(2)]
arr2 = [[0 for _ in range(2)] for _ in range(2)]

# Input values for the first matrix
print("Matrix 1 elements:")
for i in range(2):
    for j in range(2):
        while True:
            try:
                arr1[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Input values for the second matrix
print("Matrix 2 elements:")
for i in range(2):
    for j in range(2):
        while True:
            try:
                arr2[i][j] = int(input(f"Enter element at row {i + 1}, column {j + 1}: "))
                break  # Break out of the loop if input is a valid integer
            except ValueError:
                print("Invalid input. Please enter a valid integer.")

# Initialize the result matrix with zeros
arr3 = [[0 for _ in range(2)] for _ in range(2)]
```

```
# Perform matrix DIVISION
for i in range(2):
    for j in range(2):
        arr3[i][j] = (arr1[i][j] //arr2[i][j])

# Print the result matrix (matrix DIVSION)
print("Matrix division result:")
for i in range(2):
    for j in range(2):
        print(arr3[i][j], end="\t")
    print()  # Move to the next row
```

OUTPUT:

```
Matrix 1 elements:
Enter element at row 1, column 1: 1
Enter element at row 1, column 2: 1
Enter element at row 2, column 1: 1
Enter element at row 2, column 2: 1
Matrix 2 elements:
Enter element at row 1, column 1: 1
Enter element at row 1, column 2: 1
Enter element at row 2, column 1: 1
Enter element at row 2, column 2: 1
Matrix division result:
1       1
1       1
```

PROGRAM(MULTIPLY 2 MATRIX):

```
import numpy as np
 matrix1 = np.array([[1, 2, 3],
                     [4, 5, 6],
                     [7, 8, 9]])
 matrix2 = np.array([[1, 2, 3],
                     [4, 5, 6],
                     [7, 8, 9]])
result = np.dot(matrix1 ,matrix2)
```

```
 # Print the result
print("Result of Scalar Matrix Multiplication:")
print(result)
```

OUTPUT:

Result of Matrix Multiplication:

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