

Practical Ques. P7

#7. Perform other matrix operations like converting matrix data to absolute values, taking the negative of matrix values, adding/removing rows/columns from a matrix, finding the maximum

#or minimum values in a matrix or in a row/column, and finding the sum of some/all

#elements in a matrix.

```
import numpy as np
```

```
# Define a matrix
```

```
matrix = np.array([[1, -2, 3],  
                  [-4, 5, -6],  
                  [7, 8, -9]])
```

```
# Convert matrix data to absolute values
```

```
absolute_matrix = np.abs(matrix)  
print("Absolute Values of Matrix:")  
print(absolute_matrix)
```

```
# Take the negative of matrix values
```

```
negative_matrix = -matrix  
print("\nNegative of Matrix Values:")  
print(negative_matrix)
```

```
# Add a row to the matrix
```

```
new_row = np.array([10, 11, 12])
```

```
matrix_with_new_row = np.vstack([matrix, new_row])
```

```
print("\nMatrix with Added Row:")
```

```
print(matrix_with_new_row)
```

```
# Remove a row from the matrix
```

```
matrix_with_removed_row = np.delete(matrix, 1, axis=0) # Remove row at  
index 1
```

```
print("\nMatrix with Removed Row:")
```

```
print(matrix_with_removed_row)
```

```
# Add a column to the matrix
```

```
new_column = np.array([10, 11, 12]).reshape(-1, 1)
```

```
matrix_with_new_column = np.hstack([matrix, new_column])
```

```
print("\nMatrix with Added Column:")
```

```
print(matrix_with_new_column)
```

```
# Remove a column from the matrix
```

```
matrix_with_removed_column = np.delete(matrix, 1, axis=1) # Remove  
column at index 1
```

```
print("\nMatrix with Removed Column:")
```

```
print(matrix_with_removed_column)
```

```
# Find the maximum value in the matrix  
max_value = np.max(matrix)  
print("\nMaximum Value in Matrix:", max_value)
```

```
# Find the minimum value in the matrix  
min_value = np.min(matrix)  
print("Minimum Value in Matrix:", min_value)
```

```
# Find the maximum value in each row  
max_values_in_rows = np.max(matrix, axis=1)  
print("\nMaximum Values in Each Row:")  
print(max_values_in_rows)
```

```
# Find the minimum value in each column  
min_values_in_columns = np.min(matrix, axis=0)  
print("Minimum Values in Each Column:")  
print(min_values_in_columns)
```

```
# Find the sum of all elements in the matrix  
total_sum = np.sum(matrix)  
print("\nSum of All Elements in Matrix:", total_sum)
```

```
# Find the sum of elements in each row  
sum_in_rows = np.sum(matrix, axis=1)
```

```
print("Sum of Elements in Each Row:")
```

```
print(sum_in_rows)
```

```
# Find the sum of elements in each column
```

```
sum_in_columns = np.sum(matrix, axis=0)
```

```
print("Sum of Elements in Each Column:")
```

```
print(sum_in_columns)
```

Absolute Values of Matrix:

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
```

Negative of Matrix Values:

```
[[ -1  -2  -3]
 [  4  -5   6]
 [ -7  -8   9]]
```

Matrix with Added Row:

```
[[ 1 -2  3]
 [-4  5 -6]
 [ 7  8 -9]
 [10 11 12]]
```

Matrix with Removed Row:

```
[[ 1 -2  3]
 [ 7  8 -9]]
```

Matrix with Added Column:

```
[[ 1 -2  3 10]
 [-4  5 -6 11]
 [ 7  8 -9 12]]
```

Matrix with Removed Column:

```
[[ 1  3]
 [-4 -6]
 [ 7 -9]]
```

Maximum Value in Matrix: 8

Minimum Value in Matrix: -9

Maximum Value in Matrix: 8
Minimum Value in Matrix: -9

Maximum Values in Each Row:
[3 5 8]
Minimum Values in Each Column:
[-4 -2 -9]

Sum of All Elements in Matrix: 3
Sum of Elements in Each Row:
[2 -5 6]
Sum of Elements in Each Column:
[4 11 -12]