Python Programming

Lab:- 16(Numpy)

Student Id:- AF0417098

Student Name:- Ankush

Numpy:- NumPy (Numerical Python) is a powerful library in Python that provides support for large, multi-dimensional arrays and matrices, along with a collection of mathematical functions to operate on these arrays. It is fundamental for scientific computing and serves as the foundation for many other libraries, such as Pandas and Matplotlib.

Example:

lab16.py > ...

```
39
40  import numpy as np
41
42  # Create a NumPy array from a list
43  array = np.array([1, 2, 3, 4, 5])
44
45  # Display the original array
46  print("Original Array:", array)
47
48  # Perform some operations
49  # 1. Add 10 to each element
50  array_addition = array + 10
51  print("After adding 10:", array_addition)
52
53  # 2. Square each element
54  array_squared = array ** 2
55  print("Squared Array:", array_squared)
56
57  # 3. Calculate the mean of the array
58  mean_value = np.mean(array)
59  print("Mean of the Array:", mean_value)
60
61  # 4. Find the maximum and minimum values
62  max_value = np.max(array)
63  min_value = np.min(array)
64  print("Maximum Value:", max_value)
65  print("Minimum Value:", min_value)
```

1.Convert the below list into numpy array then display the array

Input: my_list = [1, 2, 3, 4, 5]

Program :-

```python
# 1. Convert the below list into numpy array then display the array
# Input: my_list = [1, 2, 3, 4, 5]
import numpy as np

# Input list
my_list = [1, 2, 3, 4, 5]

# Convert to NumPy array
array1 = np.array(my_list)

# Display the array
print("Array:", array1)

```

Output:-

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  TEST RESULTS  PORTS

PS C:\Users\Raj Kumar\Desktop\python programming> & "C:/Users/Raj Kumar/AppData/Local/Programs/Python/Python312/python.exe" "c:/Users/Raj Kumar/Desktop/python programming/lab16.py"
Array: [1 2 3 4 5]
PS C:\Users\Raj Kumar\Desktop\python programming>
```

2. Convert the below list into a numpy array then display the array then display the first and last index and then multiply each element by 2 and display the result.

Input: my_list = [1, 2, 3, 4, 5]

Program:-

```python
lab16.py > ...
    and then multiply each element by 2 and display the result.
#  Input: my_list = [1, 2, 3, 4, 5]

import numpy as np
# Input list
my_list = [1, 2, 3, 4, 5]

# Convert to NumPy array
array2 = np.array(my_list)

# Display the array
print("Array:", array2)

# Display the first and last index
print("First index:", array2[0])
print("Last index:", array2[-1])

# Multiply each element by 2
result = array2 * 2

# Display the result
print("Result after multiplication by 2:", result)
```

Output:-

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  TEST RESULTS  PORTS

PS C:\Users\Raj Kumar\Desktop\python programming> & "C:/Users/Raj Kumar/AppData/Local/Programs/Python/Python312/python.exe" "c:/Users/Raj Kumar/Desktop/python programming/lab16.py"
Array: [1 2 3 4 5]
First index: 1
Last index: 5
Result after multiplication by 2: [ 2  4  6  8 10]
PS C:\Users\Raj Kumar\Desktop\python programming>
```