

Course Name: AIML

Course code: 21CSH316

Experiment 2.1

1. **Aim :** Implementation of Python basic Libraries such as Math, Numpy and Scipy
2. **Objective :** The objective of this experiment is to implement Python basic libraries such as Math, NumPy, and SciPy.
3. **Program Code :**

A) Math Library:

```
import math
x = 4.5
square_root = math.sqrt(x)
power = math.pow(x, 2)
sine = math.sin(x)
cosine = math.cos(x)

pi = math.pi
e = math.e

# Printing the results
print(f"Square root of {x} is: {square_root}")
print(f"{x} raised to the power of 2 is: {power}")
print(f"Sine of {x} radians is: {sine}")
print(f"Cosine of {x} radians is: {cosine}")
print(f"The value of Pi is approximately: {pi}")
print(f"The value of Euler's number is approximately: {e}")
```

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```
import numpy as np
arr1 = np.array([1, 2, 3, 4, 5])
arr2 = np.array([6, 7, 8, 9, 10])

sum_array = arr1 + arr2
product_array = arr1 * arr2
dot_product = np.dot(arr1, arr2)

# Printing the results
print("Array 1:", arr1)
print("Array 2:", arr2)
print("Element-wise Sum:", sum_array)
print("Element-wise Product:", product_array)
print("Dot Product:", dot_product)
```

c) Scipy :

```
import scipy

# Example: Calculating Factorial
from scipy.special import factorial

n = 5 # Calculate the factorial of 5
result = factorial(n)

print(f"The factorial of {n} is {result}")
```

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4. Output:

A)

```
Array 2: [ 6  7  8  9 10]
Element-wise Sum: [ 7  9 11 13 15]
Element-wise Product: [ 6 14 24 36 50]
Dot Product: 130

...Program finished with exit code 0
Press ENTER to exit console.
```

B)

```
Sine of 4.5 radians is: -0.977530117665097
Cosine of 4.5 radians is: -0.2107957994307797
The value of Pi is approximately: 3.141592653589793
The value of Euler's number is approximately: 2.718281828459045

...Program finished with exit code 0
Press ENTER to exit console.
```

C)

```
The factorial of 5 is 120.0

...Program finished with exit code 0
Press ENTER to exit console.
```

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