Week2:

Study of Python Basic Libraries such as Statistics, Math, Numpy and Scipy

1. Statistics:

- The `statistics` module is part of the Python Standard Library and provides functions for calculating mathematical statistics of numeric data.
  - It includes functions for computing measures like mean, median, mode, variance, standard deviation, and more.
  - This module is useful for basic statistical analysis tasks and is easy to use for simple data sets.
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Example:

```
import statistics
    data = [1, 2, 3, 4, 5]
    mean_value = statistics.mean(data)
    median_value = statistics.median(data)
    mode_value = statistics.mode(data)
    print(mean_value)
    print(median_value)
    print(mode_value)
```

Output:

```
3
3
1
```

2. Math:

- The `math` module is also part of the Python Standard Library and provides mathematical functions for operations beyond basic arithmetic.
  - It includes functions for mathematical constants (e.g., pi, e), trigonometric functions, logarithmic functions, exponentiation, and more.
  - This module is useful for more complex mathematical calculations.
  - **Example:**

```
import math
```

```
x = math.sin(math.pi / 2)
y = math.log(10)
z = math.sqrt(25)
print(x)
print(y)
print(z)
```

Output:

```
1.0
2.302585092994046
5.0
```

3. NumPy:

- NumPy (Numerical Python) is a popular library for numerical computing in Python.
- It provides support for large, multi-dimensional arrays and matrices, along with a collection of mathematical functions to operate on these arrays.
- NumPy is widely used in scientific computing, data analysis, and machine learning tasks due to its efficient array operations and mathematical functions.

- Example:

```
import numpy as np
data = np.array([1, 2, 3, 4, 5])
mean_value = np.mean(data)
print(mean_value)
median_value = np.median(data)
print(median_value)
variance_value = np.var(data)
print(variance_value)
```

Output:

```
3.0
3.0
2.0
```