Experiment: 3.1

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1. **AIM:** *Write a python program to compute Mean, Median, Mode, Variance and Standard Deviation using Datasets*

2. **Objective:**
The objective of this experiment is to evaluate the performance of an algorithm.

3. **Tools/Resource Used:**
1. *Python programming language.*
2. *Jupyter Notebook.*

4. **Algorithm:**

- *input: A list of data points, data.*
- *Import the statistics module*
- *Define a function compute_statistics(data):*
  - *Calculate the mean of the data using statistics.mean and store it in the variable mean.*
  - *Calculate the median of the data using statistics.median and store it in the variable median.*
  - *Calculate the mode of the data using statistics.mode and store it in the variable mode.*
  - *Calculate the variance of the data using statistics.variance and store it in the variable variance.*
  - *Calculate the standard deviation of the data using statistics.stdev and store it in the variable std_deviation.*
  - *Return mean, median, mode, variance, and std_deviation.*
  - *Define a sample dataset data as a list of integers.*
- *Call the compute_statistics function with the sample dataset data as an argument, and store the results in the variables mean, median, mode, variance, and std_deviation.*
- *Print the results:*
  - *Print "Dataset: " followed by the data list.*

- *Print "Mean: " followed by the mean value.*
- *Print "Median: " followed by the median value.*
- *Print "Mode: " followed by the mode value.*
- *Print "Variance: " followed by the variance value.*
- *Print "Standard Deviation: " followed by the std_deviation value.*

- *End of the algorithm.*

5. Program Code:

```
import statistics

def compute_statistics(data):
    mean = statistics.mean(data)
    median = statistics.median(data)
    mode = statistics.mode(data)
    variance = statistics.variance(data)
    std_deviation = statistics.stdev(data)

    return mean, median, mode, variance, std_deviation

# Sample dataset
data = [4, 2, 7, 1, 9, 6, 3, 6, 8, 5]

mean, median, mode, variance, std_deviation = compute_statistics(data)

print("Dataset: ", data)
print("Mean: ", mean)
print("Median: ", median)
print("Mode: ", mode)
print("Variance: ", variance)
print("Standard Deviation: ", std_deviation)
```

6. Output/Result:

```
Dataset:  [4, 2, 7, 1, 9, 6, 3, 6, 8, 5]
Mean:  5.1
Median:  5.5
Mode:  6
Variance:  6.766666666666667
Standard Deviation:  2.6012817353502227
```

7. Learning Outcomes:

1. *Implement to implement different python library.*
2. *Understand the concept of mean,median etc.*