**Practical No: 15**

**Aim:** Functions : Write a program to: To calculate average, mean, median, and standard deviation of numbers in a list

**Course Outcome: Develop/ Use functions in Python programs for modular programming approach.**

**Requirements: Computer, Python 3.3.34, Vs Code.**

**Theory:**

## What is a function in Python?

In Python, a function is a group of related statements that performs a specific task.

Functions help break our program into smaller and modular chunks. As our program grows larger and larger, functions make it more organized and manageable.

Furthermore, it avoids repetition and makes the code reusable.

### Syntax of Function

def function\_name(parameters):

"""docstring"""

statement(s)

Above shown is a function definition that consists of the following components.

1. Keyword def that marks the start of the function header.
2. A function name to uniquely identify the function. Function naming follows the same [rules of writing identifiers in Python](https://www.programiz.com/python-programming/keywords-identifier#rules).
3. Parameters (arguments) through which we pass values to a function. They are optional.
4. A colon (:) to mark the end of the function header.
5. Optional documentation string (docstring) to describe what the function does.
6. One or more valid python statements that make up the function body. Statements must have the same indentation level (usually 4 spaces).
7. An optional return statement to return a value from the function.

**Flowchart:**

**Program:**#Aim: Functions: Write a program to: To  calculate average, mean, median, and standard deviation of  numbers in  a list

def Avg(Li):

    average = sum(Li)/NE

    print("The Average of the given List: ",round(average,2))

def Median(li):

    li.sort()

    mid = len(li) // 2

    res = (li[mid] + li[~mid]) / 2

    print("Median of the given List: ", res)

def StandardDeviation(li):

    mean = sum(li) / len(li)

    variance = sum([((x - mean) \*\* 2) for x in li]) / len(li)

    res = variance \*\* 0.5

    print("The standard Deviation the list: ", round(res,2))

NumList = []

NE = int(input("Enter the number of elements: "))

for i in range(0, NE):

    Elem = int(input("Enter the Elemnt: "))

    NumList.append(Elem)

    print(NumList)

Avg(NumList)

Median(NumList)

StandardDeviation(NumList)

**Output/Result:**

**Enter the number of elements: 3**

**Enter the Elemnt: 4**

**[4]**

**Enter the Elemnt: 97**

**[4, 97]**

**Enter the Elemnt: 65**

**[4, 97, 65]**

**The Average of the given List: 55.33**

**Median of the given List: 65.0**

**The standard Deviation the list: 38.58**

**Conclusion: hence we have used functions to calculate the average/mean, median, and standard deviation.**