**Experiment No. 4**

**Title: Program on Functions and Types**

**Batch: B1 Roll No: 1914078 Experiment No.:5**

### Aim: To implement a program using functions

**Resources needed:** Python IDE

### Theory:

A function is a block of reusable code that is used to perform a specific action. The advantages of using functions are:

* Reducing duplication of code
* Decomposing complex problems into simpler pieces
* Improving clarity of the code
* Reuse of code
* Information hiding

## Python function type

## There are two basic types of functions: built-in functions and user defined functions. The built-in functions are part of the Python language; for instance dir(), len(), or abs() etc.

### The user defined functions are functions created with the def keyword. The statements in the block of the function must be indented. The def keyword is followed by the function name with round brackets and a colon. The indented statements form a *body* of the function. The function is later executed when needed. We say that we *call* the function. If we call a function, the statements inside the function body are executed. They are not executed until the function is called.

### Functions can be assigned to variables, stored in collections, or passed as arguments. This brings additional flexibility to the language.

### #Syntax of Function

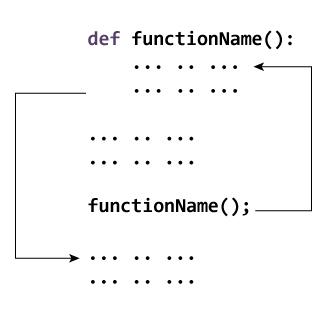
### def functionName(parameters):

### “””docstring”””

Statements(s)

#**Function calling**

functionName(parameters)



# Anonymous Function

# In Python, anonymous function means that a function is without a name. As we know that *def* keyword is used to define the normal functions and the *lambda* keyword is used to create anonymous functions.

**Syntax:**

Lamda arguments: expressions

This function can have any number of arguments but only one expression, which is evaluated and returned.

* One is free to use lambda functions wherever function objects are required.
* You need to keep in your knowledge that lambda functions are syntactically restricted to a single expression.
* It has various uses in particular fields of programming besides other types of expressions in functions.

### Activities:

### Define a module MyMath.py defining functions to perform following operations

1. power (x, y) – to compute xy
2. fact (x) – to compute x!(recursive)

Write a program to find the following series.

sin (x) = x – (x3/3!) + (x5/5!) – (x7/7!) + … upto n terms (n given by user).

(Do not make use of inbuilt functions. Use the user defined functions in MyMath.py module by using import.)

### Result:

### myMath.py

def power(x, y):

    return x\*\*y

def fact(x):

    if(0 < x < 3):

        return x

    else:

        return x\*fact(x-1)

### sinSeries.py

import myMath as m

n = int(input())

x = float(input())

x \*= 3.14/180

val = 0

num = 1

for i in range(1, n+1):

    if(i % 2 != 0):

        val += m.power(x, num) / m.fact(num)

    else:

        val -= m.power(x, num) / m.fact(num)

    num += 2

print("sin(", x, ") =", val)

### Output:-

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### Outcomes: Use of Different Decision Making Statements and Functions in Python

### Questions:

### a)Explain nested function with example?

Python supports the concept of a "nested function" or "inner function", which is simply a function defined inside another function.

def function1(): # outer function

    print ("Hello from outer function")

    def function2(): # inner function

        print ("Hello from inner function")

    function2()

function1()

### Output:-



In the above example, function2() has been defined inside function1(), making it an inner function. To call function2(), we must first call function1(). The function1() will then go ahead and call function2() as it has been defined inside it.

**Conclusion:** We implemented a program using user defined functions and executed the code.

**References:**

* 1. **Reema Thareja , “Python Programming: Using Problem Solving Approach”, Oxford University Press, First Edition 2017, India**
  2. **Sheetal Taneja and Naveen Kumar,” Python Programing: A Modular Approach”, Pearson India, Second Edition 2018, India**