CourseName: Advance Python Programming **Course code:** 22CSH-623

Experiment-1.4

A) Range Function

Aim: Write a python program to illustrate the concept of range() Function

Tools/Software Required: VS Code, Python

Description:
The range() function returns a sequence of numbers, starting from 0 by default, increments by 1 (by default), and stops before a specified number.

Syntax:

range*(start, stop, step*)

Parameters:

start: integer starting from which the sequence of integers is to be returned
stop: integer before which the sequence of integers is to be returned. The range of integers ends at stop - 1.
step: integer value which determines the increment between each integer in the sequence

Return Value: A sequence of numbers

Example:

range(10) returns 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
range(2, 10) returns 2, 3, 4, 5, 6, 7, 8, 9
range(2, 10, 2) returns 2, 4, 6, 8

CourseName: Advance Python Programming **Course code:** 22CSH-623

Implementation:

```
# Prints all the numbers from 0 to 5
for i in range(6):
    print(i, end=" ")
print()

for i in range(2, 6):
    print(i, end=" ")
print()

for i in range(2, 30, 3):
    print(i, end=" ")
print()
```

Output:

```
VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh U
$ python range.py
0 1 2 3 4 5
2 3 4 5
2 5 8 11 14 17 20 23 26 29
```

B) Calculator

Aim: Write a python program to implement a calculator.

Tools/Software Required: VS Code, Python

Description: A calculator is a device that performs arithmetic operations on numbers. The calculator can add, subtract, multiply, and divide two numbers.

Implementation:

```
def add(x, y):
    return x + y

def subtract(x, y):
    return x - y

def multiply(x, y):
    return x * y

def divide(x, y):
    return x / y

print("Select operation.")
print("1.Add")
print("2.Subtract")
print("3.Multiply")
print("4.Divide")

while True:
    choice = input("Enter choice(1/2/3/4): ")

        if choice in ('1', '2', '3', '4'):
            num1 = float(input("Enter first number: "))
            num2 = float(input("Enter second number: "))

            if choice == '1':
                print(num1, "+", num2, "=", add(num1, num2))
```

```
        elif choice == '2':
            print(num1, "-", num2, "=", subtract(num1,
num2))

        elif choice == '3':
            print(num1, "*", num2, "=", multiply(num1,
num2))

        elif choice == '4':
            print(num1, "/", num2, "=", divide(num1,
num2))
        break
    else:
        print("Invalid Input")
```

Output:

```
VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh
$ python calculator.py
Select operation.
1.Add
2.Subtract
3.Multiply
4.Divide
Enter choice(1/2/3/4): 1
Enter first number: 5
Enter second number: 2
5.0 + 2.0 = 7.0

VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh
$ python calculator.py
Select operation.
1.Add
2.Subtract
3.Multiply
4.Divide
Enter choice(1/2/3/4): 3
Enter first number: 5
Enter second number: 4
5.0 * 4.0 = 20.0
```

C) Factorial

Aim: Write a python program to calculate the factorial of a number.

Tools/Software Required: VS Code, Python

Description:

The factorial of a number is the product of all the integers from 1 to that number. For example, the factorial of 6 is 1*2*3*4*5*6 = 720.

Algorithm:

Step 1: Start
Step 2: Read the number
Step 3: Set factorial = 1
Step 4: If number is 0 or 1, then factorial = 1
Step 5: Else
  Step 5.1: Set i = 1
  Step 5.2: Repeat steps 5.3 to 5.5 while i <= number
    Step 5.3: Set factorial = factorial * i
    Step 5.4: Set i = i + 1
Step 6: Print factorial
Step 7: Stop

Implementation:

```
n = int(input("Enter a number: "))
output = 1
for i in range(1,n+1):
    output = output * i
print(output)
```

CourseName: Advance Python Programming **Course code:** 22CSH-623

Output:

```
VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh
$ python factorial.py
Enter a number: 0
1

VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh
$ python factorial.py
Enter a number: 1
1

VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh
$ python factorial.py
Enter a number: 5
120
```

D) Fibonacci Series

Aim: Write a python program to generate the Fibonacci series.

Tools/Software Required: VS Code, Python

Description:
Fibonacci series is a series of numbers in which each number is the sum of the two preceding numbers.

The simplest is the series 1, 1, 2, 3, 5, 8, etc.

Algorithm:

Step 1: Start
Step 2: Set n = 10
Step 3: Set a = 0
Step 4: Set b = 1
Step 5: Print a
Step 6: Print b
Step 7: Set i = 1
Step 8: Repeat steps 9 to 11 while i <= n
  Step 9: Set c = a + b
  Step 10: Print c
  Step 11: Set a = b
  Step 12: Set b = c
Step 13: Stop

Implementation:

```
n = int(input("Enter a number: "))
a,b = 0,1
print(a, b, end=" ")

for i in range(1,n+1):
```

CourseName: Advance Python Programming **Course code:** 22CSH-623

```
    c = a + b
    print(c, end=" ")
    a = b
    b = c
```

Output:

```
VEER@LAPTOP-STENK5RO MINGW64 ~/Documents/Chandigarh University/
$ python fibonacci.py
Enter a number: 10
0 1 1 2 3 5 8 13 21 34 55 89
```