

Practical 3

Aim: - Open the python idle editor and run simple Python scripts such as to print Fibonacci numbers, string functions. Learn how to install modules using Pip and write functions

pip is a *de facto* standard package-management system used to install and manage software packages written in Python. Many packages can be found in the default source for packages and their dependencies — Python Package Index (PyPI).

Most distributions of Python come with pip preinstalled. Python 2.7.9 and later (on the python2 series), and Python 3.4 and later include pip (pip3 for Python 3) by default.

| print | add | functions | pip

```
pip --version

pip install 'SomeProject'

pip install 'SomeProject==1.4'

pip install --upgrade SomeProject

pip install --index-url http://my.package.repo/simple/ SomeProject
```

In mathematics, the **Fibonacci numbers**, commonly denoted F_n , form a sequence, called the Fibonacci sequence, such that each number is the sum of the two preceding ones, starting from 0 and 1. That is,

0 1 1 2 3 5 8 13 21 34 55 89 144

Fibonacci Series program with loop

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```
import time as _time
def fib(n):
    a,b = 0,1
    for i in range(n):
        a,b = b, a+b
        #print ("%d term is = %d" %(i+1, a))
    return a

current_millis = lambda: int(round(_time.time() * 1000))
input = int(input("Input term = "))
starttime = current_millis()
x = fib(input)
endtime = current_millis()
print("The term value is %d Time taken is %f" %(x,(endtime - starttime)))
```

```
Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
===== RESTART: C:/Users/AMRIT/Desktop/iotpract3.1.py
Input term : 20
1 term is = 1
2 term is = 1
3 term is = 2
4 term is = 3
5 term is = 5
6 term is = 8
7 term is = 13
8 term is = 21
9 term is = 34
10 term is = 55
11 term is = 89
12 term is = 144
13 term is = 233
14 term is = 377
15 term is = 610
16 term is = 987
17 term is = 1597
18 term is = 2584
19 term is = 4181
20 term is = 6765
Term value is 6765 and time taken is 61.000000
```

Fibonacci Series program with Recursion

```
import time as _time
def fibR(n):
    a, i = 0, 1
    if n==1 or n == 2:
        return 1
    return fibR(n-1)+fibR(n-2)

current_millis = lambda: int(round(_time.time() * 1000))
input = int(input("Input term = "))
starttime = current_millis()
x = fibR(input)
endtime = current_millis()
print("The term value is %f Time taken is %f" %(x, (endtime - starttime)))
```

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```
===== RESTART: C:/Users/AMRIT/Desktop/iotpract3.2.py =====  
Input term : 20  
Term value is 6765.000000 and time taken is 2.000000
```

Updated recursion program: -

#Using Recursion

```
import time as _time
```

```
def fibR(n):
```

```
    if n <= 1:
```

```
        return n
```

```
    return fibR(n-1)+fibR(n-2)
```

```
current_millis = lambda : int(round(_time.time() * 1000))
```

```
input = int(input("Input term = "))
```

```
starttime = current_millis()
```

```
for i in range(input):
```

```
    print(i+1," term is ",fibR(i+1))
```

```
endtime = current_millis()
```

```
print("Time taken by Recursion is %f"%(endtime-starttime))
```

Output:

```
===== RESTART: C:/Users/Harsh Pandey/Desktop/FibonacciRecursion.py =====  
Input term = 20  
1 term is 1  
2 term is 1  
3 term is 2  
4 term is 3  
5 term is 5  
6 term is 8  
7 term is 13  
8 term is 21  
9 term is 34  
10 term is 55  
11 term is 89  
12 term is 144  
13 term is 233  
14 term is 377  
15 term is 610  
16 term is 987  
17 term is 1597  
18 term is 2584  
19 term is 4181  
20 term is 6765  
Time taken by Recursion is 442.000000
```