ExperimentNo.:-1

Write a program non-recursive and recursive program to calculate Fibonacci numbers and analyze their time and space complexity.

1)Non-RecursiveProgram

Source Code:-

In[1]:
```
nterms=int(input("Howmanyterms?"))

#firsttwoterms
n1,n2=0,1
count=0

#checkifthenumberoftermsisvalid
ifnterms<=0:
   print("Pleaseenterapositiveinteger")
#ifthereisonlyoneterm,returnn1
elifnterms==1:
   print("Fibonacci sequence upto",nterms,":")
   print(n1)
#generatefibonaccisequence
else:
   print("Fibonaccisequence:")
   while count < nterms:
       print(n1)
       nth=n1+n2#
       update values
       n1 = n2
       n2=nth
       count+=1
```

```
Howmanyterms?7
Fibonaccisequence:
0
1
1
2
3
5
8
```

1.RecursiveProgram Source

Code:-

In[2]:

```
deffibonacci(n):
    ifn<=0:
        return[]
    elifn==1:
        return[0]
    elifn==2:
        return[0,1]
    else:
        seq=fibonacci(n-1)
        seq.append(seq[-1]+seq[-2])
        returnseq

nterms=int(input("Howmanyterms?"))

#checkifthenumberoftermsisvalid
ifnterms<=0:
    print("Pleaseenterapositiveinteger")
else:
    print("Fibonaccisequence:")
    fib_sequence=fibonacci(nterms)
    for num in fib_sequence:
        print(num)
```

```
Howmanyterms?7
Fibonaccisequence:
0
1
1
2
3
5
8
```

In[]: