Title of the Assignment: Write a program non-recursive and recursive program to calculate Fibonacci numbers and analyze their time and space complexity.

Code: (non-recursion)

```
# Program to display the Fibonacci sequence up to n-th term
nterms = int(input("How many terms? "))
# first two terms
n1, n2 = 0, 1
count = 0
# check if the number of terms is valid
if nterms <= 0:
        print("Please enter a positive integer")
# if there is only one term, return n1
elif nterms == 1:
                print("Fibonacci sequence upto",nterms,":")
print(n1)
# generate fibonacci sequenceelse:
        print("Fibonacci sequence:")
        while count < nterms:
                print(n1)
                nth = n1 + n2
# update values
n1 = n2
n2 = nth
count += 1
```

Output :

```
How many terms? 7
Fibonacci sequence:
0
1
1
2
3
5
8
```

Code : (recursion)

```
# Python program to display the Fibonacci sequence
def recur_fibo(n):
if n <= 1:
        return n
else:
        return(recur_fibo(n-1) + recur_fibo(n-2))
nterms = 7
# check if the number of terms is valid
if nterms <= 0:
        print("Plese enter a positive integer")
else:
        print("Fibonacci sequence:")
        for i in range(nterms):
                print(recur_fibo(i))
```

Output :

```
Fibonacci sequence:
0
1
1
2
3
5
8
```