Assignment - 22 More on Recursion

1. Write a recursive python function to calculate sum of first N natural numbers.

```
def naturalSum(n):
    if n<=0:
        return n
    else:
        return n+naturalSum(n-1)
num=int(input("Enter a number:"))
print(naturalSum(num))
```

Output:-

```
Enter a number:5
15
```

2. Write a recursive python function to calculate sum of first N odd natural numbers.

```
def naturalSum(n):
    if n<=0:
        return n
    else:
        return (2*n-1)+naturalSum(n-1)
num=int(input("Enter a number:"))
print(naturalSum(num))
```

Output:-

```
Enter a number:5
25
```

3. Write a recursive python function to calculate sum of first N even natural numbers.

```
def naturalSum(n):
    if n<=0:
        return n
    else:
        return (2*n)+naturalSum(n-1)
num=int(input("Enter a number:"))
print(naturalSum(num))
```

Output:-

```
Enter a number:5
30
```

4. Write a recursive python function to calculate sum of squares of first N natural numbers.

```
def naturalSum(n):
    if n<=0:
        return n
    else:
        return (n*n)+naturalSum(n-1)
num=int(input("Enter a number:"))
print(naturalSum(num))
```

Output:-

```
Enter a number:5
55
```

5. Write a recursive python function to calculate sum of cubes of first N natural numbers.

```
def naturalSum(n):
    if n<=0:
        return n
    else:
        return (n*n*n)+naturalSum(n-1)
num=int(input("Enter a number:"))
print(naturalSum(num))
```

Output:-

```
Enter a number:5
225
```

6. Write a recursive python function to calculate the factorial of a number.

```
def fact(n):
    if n==1:
        return n
    else:
        return n*fact(n-1)
x=fact(5)
if x<0:
    print("Sorry!,factorial is not exists.")
elif x==0:
    print("Factorial of 0 is not exists.")
else:
    print("Factorial is",x)
```

Output:-

Factorial is 120

7. Write a recursive python function to calculate sum of the digits of a given number.

```
def naturalSum(n,sum):
    if n==0:
        return sum
    else:
        return n%10+naturalSum(n//10,sum)
num=int(input("Enter a number:"))
print(naturalSum(num,0))
```

Output:-

Enter a number:451

10

8. Write a recursive python function to print binary of a given decimal number.

```
def bin_(n):
    if n>1:
        bin_(n//2)
    print(n%2,end='')
num=int(input("Enter a number:"))
print(bin_(num))
```

Output:-

Enter a number:6

110

9. Write a recursive python function to print octal of a given decimal number.

```
def bin_(n):
   if n>1:
      bin_(n//8)
   print(n%8,end='')
num=int(input("Enter a number:"))
print(bin_(num))
```

Output:-

```
Enter a number:10
12
```

10. Write a recursive python function to find the Nth term of the Fibonacci series.

```
def Fibonacci(n):
        if n<= 0:
           print("Incorrect input")
        elif n == 1:
           return  n
        elif n == 2:
           return 1
        else:
           return Fibonacci(n-1)+Fibonacci(n-2)


print(Fibonacci(10))
```

Output:-

```
55
```