Assignment on Functions

1)

```
def non_recursive(n,a,b):
    for i in range(n):
        s=a+b
        a=b
        b=s
        print(s,end=" ")

def recursive(n,a,b):
    if n!=0:
        s=a+b
        print(s,end=" ")
        a=b
        b=s
        recursive(n-1,a,b)

print("...Fibonacci series upto nth term...")
n=int(input("Enter the value of n: "))
a=0
b=1
i=int(input("Type 1 for recursive and 2 for non recursive: "))
if i==1:
    print("Fibonacci Series (Recursive):")
    print(0," ",1)
    recursive(n,a,b)
elif i==2:
    print("Fibonacci Series (Non-Recursive):")
    print(0," ",1)
    non_recursive(n,a,b)
else:
    print("Wrong input!!")
```

Output:

```
... Fibonacci series upto n-th term…
Enter the value of n:7
Type 1 for recursive and 2 for non-recursive:1
Fibonacci series(Recursive):
0 1 1 2 3 5 8
```

2)

```
def printPascal(n):
    for line in range(1, n + 1):
        C = 1;
```

```
        for i in range(1, line + 1):
            print(C, end = " ");
            C = int(C * (line - i) / i);
        print("");
n = int(input("Enter number of rows:"))
print("The triangle is:")
pascal(n)
```

Output:

```
Enter number of rows:5
The triangle is:
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
```

3)

```
def gcd_n(n):   #gcd of n numbers
    a = int(input("Enter a number: "))
    b = int(input("Enter another number: "))
    ans = gcd(a, b)
    n = n-2
    while n>0:
        a=int(input("Enter another number: "))
        ans = gcd(a, ans)
        n = n-1
    return ans

def gcd(a,b):#gcd of 2 numbers
    if a < b:
        a=b
        b=a
    if a%b:
        return gcd(b, a%b)
    return b

n = int(input("Enter the number of numbers to calculate gcd : "))
ans = gcd_n(n)
print("GCD of these ", n, "numbers is ", ans)
```

Output:

```
Enter the number of numbers to calculate gcd: 5
Enter a number:4
```

```
Enter another number:8
Enter another number:12
Enter another number:16
Enter another number:20
GCD of these 5 numbers:4
```

4)

```
def add(n1,n2):
    return n1+n2
def subtract(n1,n2):
    return n1-n2
def multiply(n1,n2):
    return n1*n2
def divide(n1,n2):
    q=n1//n2
    print("Quotient is :",q)
    rem=n1%n2
    print("Remainder is :",rem)
def exponent(n1,n2):
    return n1**n2
print("...OPERATIONS...\n"
      "1. Add\n"
      "2. Subtract\n"
      "3. Multiply\n"
      "4. Divide\n"
      "5. Exponential\n"
      "6. EXIT")
while True:
    ch = int(input("Choose from 1, 2, 3, 4, 5, 6 :"))
    if select == 6:
        print("END OF OPERATIONS!!!")
        break
    elif select == 1:
        print("...ADDITION...\n")
        n1=int(input("Enter first number: "))
        n2=int(input("Enter second number:")
        a=add(n1,n2)
        print("The result:",a)
    elif select == 2:
        print("...SUBTRACTION...\n")
        n1=int(input("Enter first number: "))
        n2=int(input("Enter second number: "))
        s=subtract(n1,n2)
        print("The result:",s)
```

```
    elif select == 3:
        print("...MULTIPLICATION...\n")
        n1=int(input("Enter first number: "))
        n2=int(input("Enter second number: "))
        m=multiply(n1,n2)
        print("The result:",m)
    elif select == 4:
        print("...DIVISION...\n")
        n1=int(input("Enter dividend: "))
        n2=int(input("Enter divisor: "))
        divide(n1,n2)
    elif select == 5:
       print("...EXPONENTIATION...\n")
        n1=int(input("Enter base number: "))
        n2=int(input("Enter exponent number: "))
        e=exponent(n1,n2)
        print("The result:",e)
    else:
        print("INVALID INPUT!!")
```

Output:

```
...OPERATIONS…
```

1. Add
2. Subtract
3. Multiply
4. Divide
5. Exponential
6. Exit

```
Choose from 1,2,3,4,5,6:4
...DIVISION…
Enter dividend:12
Enter divisor:5
Quotient is:2
Remainder is:2
Choose from 1,2,3,4,5,6:6
END OF OPERATIONS!!!
```

5)

```
def boxvol(l=1,w=1,h=1):
    return l*w*h
print("Default box volume:",boxvol())
l = int(input("Enter length:"))
print("Volume with length:",boxvol(l))
w = int(input("Enter width:"))
```

```
print("Volume with length and width:",boxvol(l,w))
h = int(input("Enter height:"))
print("Volume with length, width and height:",boxvol(l,w,h))
```

Output:

```
Default box volume:1
Enter length:3
Volume with length:3
Enter width:4
Volume with length and width:12
Enter height:6
Volume with length, width and height:72
```

6)

```
def study(name,*fav):
    print(name,"likes to read")
    for sub in fav:
        print(sub)
study("Moitrish","C programming")
study("Moitrish","C programming","DSA","Python")
study("Moitrish","C programming","DSA","Python","DBMS")
```

Output:

```
Moitrish likes to read C programming
Moitrish likes to read C programming DSA Python
Moitrish likes to read C programming DSA Python DBMS
```

7)

```
def si(p, t, a):
    if a >= 60:
        return p*0.12*t
    return p*0.1*t

p = int(input("Enter the amount to deposit: "))
t = int(input("Enter the number of years: "))
a = int(input("Enter your age: "))
interest = si(p, t, a)
print("The amount of interest you will gain is: ", interest)
print("So, the total amount will be: ", interest + p)
```

Output:

```
Enter the amount to deposit:10000
Enter the number of years:5
Enter your age:65
```

The amount of interest you will gain is:6000
So, the total amount will be:16000

8)

```
def fact(n):
    if(n==0):
        return 1
    else:
        return n * fact(n-1)
def perm(a,b):
    p=a/b
    return p

n=int(input("Enter the value of n: "))
r=int(input("Enter the value of r: "))
a=fact(n)
b=fact(n-r)
p=perm(a,b)
print("The answer:",p)
```

Output:

```
Enter the value of n:5
Enter the value of r:3
The answer:60
```

9)

```
def combination(n, r):
    ans = permutation(n, r)//factorial(r)
    for i in range (1, r+1):
        ans = ans/i
    return ans

def permutation(n, r):
    ans = 1
    for i in range(n-r+1, n+1):
        ans = ans*i
    return ans

def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n-1)
```

```
n = int(input("Enter the value of n:"))
r = int(input('Enter the valie of r:"))
comb = combination(n,r)
print("The answer:",comb)
```

Output:

```
Enter the value of n:5
Enter the value of r:3
The answer:10
```

10)

```
def maxm(a,b,c):
    if a>= b and a>=c:
        return a
    if b>=c and b>=a:
        return b
    if c>=a and c>=b:
        return c

def minm(a,b,c):
    if a<= b and a<=c:
        return a
    if b<=c and c<=a:
        return b
    if c<=b and b<=a:
        return c

a = int(input("Enter first number: "))
b = int(input("Enter second number: "))
c = int(input("Enter third number: "))
print("Maximum: ", maxm(a, b, c))
print("Minimum: ", minm(a, b, c))
```

Output:

```
Enter first number:4
Enter second number:7
Enter third number:1
Maximum:7
Minimum:1
```

11)

```
import sys
print("Program name:",sys.argv[0])
args = sys.argv[1:]
```

```
print("No. of arguments:",len(args))
if len(args)>0:
    print("The arguments:")
    for i in args:
        print(args[i])
```

Output:

```
Program name:f11.py
No. of arguments:0
```