PROBLEM SOLVING AND PYTHON PROGRAMMING

ASSIGNMENT -2

NUMBER SERIES :

1)**WRITE A PROGRAM TO FIND THE SERIES OF NUMBER 0 2 6 12 20 30 42….N**

PROGRAM :

```
n=int(input("Enter the value of N: "))
a=0
b=2
for i in range(1,n+1):
  print(a,end=" ")
  a+=b
  b+=2
```

OUTPUT :

```
Enter the value of N: 10
0 2 6 12 20 30 42 56 72 90
```

2)WRITE A PROGRAM TO PRINT SERIES 0,2,8,14,24,34…N

PROGRAM :

```
n=int(input("enter the value of N:"))
a=0
d=2
for i in range(1,n+1):
        print(a,end = " ")
        a+=d
        d+=4
```

OUTPUT :

```
enter the value of N:5
0 2 8 18 32
```

3)WRITE A PROGRAM TO PRINT ARITHMETIC SERIES 1 4 7 10…

PROGRAM :

```
n=int(input("enter the n value :"))
a=1
for i in range(1,n+1) :
        print(a,end=" ")
        a=a+3
```

OUTPUT :

```
enter the n value :10
1 4 7 10 13 16 19 22 25 28
```

4)write a program to a sum of the series 1**3+2**3+3**3+4**3+.....n

PROGRAM :

```
n = int(input("Enter the value of n: "))
sum = 0
for i in range(1, n+1):
   sum = sum + i**3
print("Sum of the series is:", sum)
```

OUTPUT :

```
Enter the value of n: 10
Sum of the series is: 3025
```

5)wriite a program to find the sum oof the series 2+4+6+8+....+n

PROGRAM :

```
n = int(input("Enter the value of n: "))
sum = 0
for i in range(2, n + 1,2):
 sum = sum + i
print("The sum of the series is", sum)
```

OUTPUT :

```
Enter the value of n: 10Enter the value of n: 10
Sum of the series is: 3025
```

6)write a program of the sum series 1+11+111+1111+....+N

PROGRAM :

```
n=int(input("Enter the value of N: "))
sum=0
for i in range(1,n+1):
   sum=sum+i*(10**(i-1))
print(sum)
```

OUTPUT :

```
Enter the value of N: 10
10987654321
```

7)write a program for sum of the series 1/2!+2/3!+3/5!+4/6!+...N/(N+1)!

```
n=int(input("Enter the value of n:"))
sum=0
for i in range(1,n+1):
   sum=sum+(i/(i+1))
print("Sum of the series is:",sum)
```

OUTPUT :

```
Enter the value of n:10
Sum of the series is: 7.980122655122655
```

8)write a program for to print the fibonacci series

```
f1=int(input("enter the 1 value:"))
f2=int(input("enter the 2nd value:"))
n=int(input("enter the n value:"))
print(f1)
print(f2)
i=0
while (i<n-2):
    f3=f1+f2
    print(f3)
    f1=f2
    f2=f3
    i=i+1
```

OUTPUT :

```
enter the 1 value:10
enter the 2nd value:20
enter the n value:10
10
20
30
50
80
130
210
340
550
890
```

9)write the python code for the sum of the series 1+3+5+7...+n

PROGRAM :

```
N=int(input("enter the no:"))
sum=0
for i in range(1,N+1,2):
   sum+=i
print("sum of the series 1+3+5+7+...+n",sum)
```

OUTPUT :

```
enter the no:5
sum of the series 1+3+5+7+...+n=25
```

10)write a program to sum of the series1+2+3+..+N

PROGRAM :

```
N=int(input("enter the number:"))
sum=0
for i in range (1,N+1):
   sum+=i
print("sum of the series1+2+3+..+n=",sum)
```

OUTPUT :

```
enter the number:5
sum of the series1+2+3+..+n= 15
```

11)write a program to find the sum of the series 1!+2!+3!+..+n!

PROGRAM :

```
n = int(input('Enter the value of n: '))
sum = 0
for i in range(1, n+1):
  fact = 1
  for j in range(1, i+1):
    fact = fact * j
  sum += fact
print('The sum of the series is',sum)
```

OUTPUT :

Enter the value of n: 5

The sum of the series is 153

12)write a program for to find the sum of the series 9+99+999+9999+...+n

PROGRAM :

```
n = int(input("Enter the no of terms: "))
sum = 0
for i in range(1, n+1):
    sum = sum + ((10**i)-1)
print("Sum of series is: ",sum)
```

OUTPUT :

Enter the no of terms: 5

Sum of series is: 111105

NUMBER PATTERN PYRAMID

(2)(i)pyhton program to print the following simple number pattren using for loop

PROGRAM :

```
for i in range(0,5):
    for j in range(i):
        print (i, end=" ")
    print("\r")
```

OUTPUT :

1

2 2

3 3 3

4 4 4 4

(2)(ii)how to print the following half pyramid pattern of numbers

PROGRAM :

```
n=5
for i in range(1,n+1):
    for j in range(1,i+1):
        print(j, end=" ")
    print("\r")
```

OUTPUT :

1

1 2

1 2 3

1 2 3 4

(2)(iii)write a python code for inverted pyramid pattern of numbers

PROGRAM :

```
n=6
for i in range (n,0,-1):
    for j in range(1,i):
        print(j,end="")
    print("\r")
```

OUTPUT :

1 2 3 4 5

12345

1234

123

12

1

(2)(iv)write a python code for inverted pyramid pattern with same digit

PROGRAM :

```
n=int(input("Enter a number: "))
for i in range(n,0,-1):
    for j in range(1,i+1):
        print(n,end=" ")
    print("")
```

OUTPUT :

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

(2)(v)write a python code for alternate odd numbers pattern using while loop

PROGRAM :

```
num = 1
while num <= 9:
    for i in range(num):
        if num%2 != 0:
            print(num, end=" ")
    num += 1
    print("\n")
```

OUTPUT :

```
1
3 3 3
5 5 5 5 5
7 7 7 7 7 7 7
9 9 9 9 9 9 9 9 9
```

(2)(vi)write a python code for reverse pyramid of numbers.

PROGRAM :

```
n=int(input("Enter the number of rows: "))
for i in range(n,0,-1):
    for j in range(1,i+1):
        print(j,end=" ")
    print("")
```

OUTPUT :

```
Enter the number of rows: 6
1 2 3 4 5 6
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

PYRAMID PATTERN USING STAR

(3)(i)write a python code for simple half pyramid pattern for using star.

PROGRAM :

```
for i in range(5):
    for j in range(i):
        print('* ', end="")
    print('')
```

OUTPUT :

```
*
* *
* * *
* * * *
```

(3)(ii)write a python code for downward half-pyramid pattern for using star.

PROGRAM :

```
n=int(input("Enter the number of rows: "))
for i in range(n,0,-1):
    print((n-i) * ' ' + i * '* ')
```

OUTPUT :

```
Enter the number of rows: 6
* * * * * *
 * * * * *
  * * * *
   * * *
    * *
     *
```

(3)(iii)write a python code for downward full pyramid pattern of star.

PROGRAM :

```
num=int(input("Enter the number of rows: "))
for i in range (num,0,-1):
    for j in range(0,i):
        print("*",end=" ")
    print()
```

OUTPUT :

```
Enter the number of rows: 5
* * * * *
* * * *
* * *
* *
*
```

(3)(iv)write a python code for right down mirron star pattern.

PROGRAM :

```
n=int(input("Enter number of rows: "))
for i in range(n):
    for j in range(n-i-1):
        print(end=" ")
    for j in range(i+1):
        print("*",end="")
    print()
```

OUTPUT :

```
Enter number of rows: 10
         *
        **
       ***
      ****
     *****
    ******
   *******
  ********
 *********
**********
```

(3)(v)write a python code for equilateral triangle pattern of star.

PROGRAM :

```
n = int(input("Enter the number of rows: "))
for i in range(1, n+1):
    for j in range(1, (n-i)+1):
        print(end=" ")
    for j in range(1, i+1):
        print("*", end=" ")
    for j in range(1, i):
        print("*", end=" ")
    print()
```

OUTPUT :

```
Enter the number of rows: 5
    *
   * * *
  * * * * *
 * * * * * * *
* * * * * * * * *
```

(3)(vi)write a python code for right start pyramid pattern of star.

PROGRAM :

```
n=int(input("Enter the number of rows: "))
i=1
while i<=n:
    print((n-i) * ' ' + i * '* ')
    i=i+1
```

OUTPUT :

```
Enter the number of rows: 7
      *
     * *
    * * *
   * * * *
  * * * * *
 * * * * * *
* * * * * * *
```

PROBLEMS

(4)(i)write a python code for decimal to binary number.

PROGRAM :

```
dec = int(input('Enter a decimal number: '))
binary = ''
while dec != 0:
        binary = str(dec % 2) + binary
        dec = dec // 2
print('The binary value is:', binary)
```

OUTPUT :

```
Enter a decimal number: 50
The binary value is: 110010
```

(4)(ii)write a python code for binary to decimal number.

PROGRAM :

```
binary_num = list(input("Input a binary number: "))
value = 0
power = len(binary_num) - 1
while power >= 0:
        digit = binary_num.pop()
        if digit == '1':
                value += pow(2, power)
        power -= 1
print("Decimal value is", value)
```

OUTPUT :

```
Input a binary number: 00001010
Decimal value is 80
```

(4)(iii)write python code for check the given no is amstrong no.

PROGRAM :

```
n=int(input("Enter a number: "))
sum=0
temp=n
while temp>0:
  d=temp%10
  sum+=d**3
  temp//=10
if n==sum:
  print(n,"is an Armstrong number")
else:
  print(n,"is not an Armstrong number")
```

OUTPUT :

```
Enter a number: 509
509 is not an Armstrong number
```

(4)(iv)write a python code for reversing a number.

PROGRAM :

```
num = int(input("Enter a number: "))
rev = 0
while num > 0:
    rem = num % 10
    rev = (rev *10) + rem
    num = num // 10
print("Reversed Number:", rev)
```

OUTPUT :

Enter a number: 45

Reversed Number: 54

(4)(v)write a python code for print the all prime numbers 1-50.

PROGRAM :

```
a = 0
b = 50
print("Prime numbers between", a, "and", b, "are:")
for num in range(a, b + 1):
   if num > 1:
       for i in range(2, num):
           if (num % i) == 0:
               break
       else:
           print(num)
```

OUTPUT :

Prime numbers between 0 and 50 are:

2

3

5

7

11

13

17

19

23

29

31

37

41

43

47

(4)(vi)write a python code for print all the leap year from 1900-2000

PROGRAM :

```
year = 1900
while year <= 2000:
   if (year % 4 == 0 and year % 100 != 0) or year % 400 == 0:
      print(year, end = ' ')
   year = year + 1
```

OUTPUT :

1904 1908 1912 1916 1920 1924 1928 1932 1936 1940 1944 1948 1952 1956 1960 1964 1968 1972 1976 1980 1984 1988 1992 1996 2000.