**ASSIGNMENT -2**

**PROBLEMS ON CONTROL STATEMENTS**

**Number series:**

1.Write a Program to print series 0 2 6 12 20 30 42 ...N.

**CODE:**

n=int(input("Enter the range of number:"))

i=1

while i<=n:

print((i\*i)-i,end=" ")

i+=1

**OUTPUT:**

Enter the range of number:7

0 2 6 12 20 30 42

2.Write a Program to print series 0,2,8,14,24,34 ...N.

**CODE:**

n=int(input("Enter the range of number(Limit):"))

i=1

pr=0

while i<=n:

if(i%2==0):

pr=pow(i, 2) - 2

print(pr,end=" ")

else:

pr = pow(i, 2) - 1

print(pr, end=" ")

i+=1

**OUTPUT:**

Enter the range of number(Limit):7

0 2 8 14 24 34 48

3.Write a program to print Arithmetic series 1 4 7 10…

**CODE:**

print("Series:")

for i in range(1,10 , 3) :

print(i, end = ' ')

**OUTPUT:**

Series:

1 4 7

4.Write a Program to Find the sum of series 1³+2³+3³+4³.....+N³.

**CODE:**

n=int(input("Enter the range of number:"))

sum=0

for i in range(1,n+1):

sum+=(i\*i\*i)

print("The sum of the series = ",sum)

**OUTPUT:**

Enter the range of number:5

The sum of the series = 225

5.Write a Program to Find the sum of series 2+4+6+8.....+N.

**CODE:**

n=int(input("Enter the range of number:"))

sum=0

i=0

while i<=n:

sum+=i

i+=2

print("The sum of the series = ",sum)

**OUTPUT:**

Enter the range of number:8

The sum of the series = 20

6.Write a Program to Find the sum of series 1+11+111+1111.....+N.

**CODE:**

n = int(input("Enter number N: "))

print()

sum = 0

str = ''

for i in range(n):

str = str + '1'

sum = sum + int(str)

print(f'Sum: {sum}')

**OUTPUT:**

Enter number N: 5

Sum: 12345

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

**CODE:**

x = int(input("Enter the value of x: "))

sum = 0

m = 1

for i in range(1, 7) :

fact = 1

for j in range(1, i+1) :

fact \*= j

term = x \*\* i / fact

sum += term \* m

m = m \* -1

print("Sum =", sum)

**OUTPUT:**

Enter the value of x: 2

Sum = 0.8444444444444444

8.Write a Program to print the Fibonacci series.

**CODE:**

n = int(input("Enter the value of 'n': "))

a = 0

b = 1

sum = 0

count = 1

print("Fibonacci Series: ", end = " ")

while(count <= n):

print(sum, end = " ")

count += 1

a = b

b = sum

sum = a + b

**OUTPUT:**

Enter the value of 'n': 5

Fibonacci Series: 0 1 1 2 3

9.Write a program to find the sum of series 1+3+5+7..+N.

**CODE:**

print("Enter the range of number:")

n=int(input())

sum=0

i=1

while(i<=n):

sum+=i

i+=2

print("The sum of the series = ",sum)

**OUTPUT:**

Enter the range of number:

6

The sum of the series = 9

10.Write a program to find the sum of series 1+2+3..+N.

**CODE:**

n=int(input("Enter the value of 'n' = "))

sum = 0

for i in range(1,n+1):

sum+=i

print("Sum of the series is",sum)

**OUTPUT:**

Enter the value of 'n' = 7

Sum of the series is 28

11.Write a Program to find the sum of series 1!+2!+3!...+n!

**CODE:**

n = int(input("Enter n value:"))

fact = 1

if(n==0):

fact = 1

sum = 0

for i in range(1,n+1):

fact = fact\*i

sum = sum + fact

print(sum)

**OUTPUT:**

Enter n value:5

153

12.Write a Program to Find the sum of series 9+99+999+9999.....+N.

**CODE:**

n = int(input("Enter the range of number:"))

sum = 0

num = 9

for i in range(1,n+1):

sum = sum + num

num = (num\*10)+9

print("The sum of the series=", sum)

**OUTPUT:**

Enter the range of number:9

The sum of the series= 1111111101

Number Pattern:

13.Python program to print the following simple number pattern using a for loop.

**CODE:**

n=5

for num in range(n+1):

for i in range (num ):

print(num,end= " ")

print("\r")

**OUTPUT:**

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

14.print the following half pyramid pattern of numbers

**CODE:**

n = int(input("Enter number of rows: "))

for i in range(1,n+1):

for j in range(1, i+1):

print(j, end="")

print()

**OUTPUT:**

Enter number of rows: 5

1

12

123

1234

12345

15.Inverted pyramid pattern of numbers

**CODE:**

row=5

a=0

for i in range(row,0,-1):

a+=1

for j in range(1,i+1):

print(a,end=" ")

print('\r')

**OUTPUT:**

1 1 1 1 1

2 2 2 2

3 3 3

4 4

5

16.Inverted Pyramid pattern with the same digit

**CODE:**

rows = 5

num = rows

for i in range(rows, 0, -1):

for j in range(0, i):

print(num, end=' ')

print("\r")

**OUTPUT:**

5 5 5 5 5

5 5 5 5

5 5 5

5 5

5

17.Alternate numbers pattern using while loop

**CODE:**

rows = 5

i = 1

while i <= rows:

j = 1

while j <= i:

print((i \* 2 - 1), end=" ")

j = j + 1

i = i + 1

print('')

**OUTPUT:**

1

3 3

5 5 5

7 7 7 7

9 9 9 9 9

18.Reverse Pyramid of Numbers

**CODE:**

size= int(input("Enter the size of the series"))

i=1

while(i<=size):

j=i

while(j>=1):

print(j, end = ' ')

j=j-1

i=i+1

print("")

**OUTPUT:**

Enter the size of the series5

1

2 1

3 2 1

4 3 2 1

5 4 3 2 1

Pyramid Pattern:

19.Simple half pyramid pattern:

**CODE:**

for i in range(0,5):

print()

for j in range(0, i+1):

print("\* ",end="")

**OUTPUT:**

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

20.Downward half-Pyramid Pattern of Star

**CODE:**

rows = int(input("Enter number of rows: "))

for i in range(rows, 0, -1):

for j in range(0, i):

print("\* ", end=" ")

print("\n")

**OUTPUT:**

Enter number of rows: 5

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

21.Downward full Pyramid Pattern of star

**CODE:**

rows = int(input("Enter number of rows: "))

for i in range(rows, 1, -1):

for space in range(0, rows-i):

print(" ", end="")

for j in range(i, 2\*i-1):

print("\* ", end="")

for j in range(1, i-1):

print("\* ", end="")

print()

**OUTPUT:**

Enter number of rows: 6

\* \* \* \* \* \* \* \* \*

\* \* \* \* \* \* \*

\* \* \* \* \*

\* \* \*

\*

22.Right down mirror star Pattern

**CODE:**

rows = int(input("Please Enter the Total Number of Rows : "))

print("Reverse Mirrored Right Triangle Star Pattern")

for i in range(1, rows + 1):

for j in range(1, rows + 1):

if(j < i):

print(' ', end = ' ')

else:

print('\*', end = ' ')

print()

**OUTPUT:**

Please Enter the Total Number of Rows : 5

Reverse Mirrored Right Triangle Star Pattern

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

23.Equilateral triangle pattern of star

**CODE:**

n=5

for i in range(1, 6):

print(' '\*n, end='')

print('\* '\*(i))

n-=1

**OUTPUT:**

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

24.Right start pattern of star

**CODE:**

n = 5

for i in range(n):

for j in range(i + 1):

print('\*', end="")

print()

for i in range(n):

for j in range(n - i - 1):

print('\*', end="")

print()

**OUTPUT:**

\*

\*\*

\*\*\*

\*\*\*\*

\*\*\*\*\*

\*\*\*\*

\*\*\*

\*\*

\*

25.Convert decimal to binary number

**CODE:**

n=int(input("Enter a number: "))

a=[]

while(n>0):

d=n%2

a.append(d)

n=n//2

a.reverse()

print("Binary Equivalent is: ")

for i in a:

print(i,end=" ")

**OUTPUT:**

Enter a number: 15

Binary Equivalent is:

1 1 1 1

26.Convert binary to decimal number

**CODE:**

print("Enter the Binary Number: ")

b= int(input())

d = 0

i = 1

while b!=0:

rem = b%10

d = d + (rem\*i)

i = i\*2

b= int(b/10)

print("\nEquivalent Decimal Value = ", d)

**OUTPUT:**

Enter the Binary Number:

1011

Equivalent Decimal Value = 11

27.Check the given number is Armstrong number

**CODE:**

n=int(input("enter the number:"))

num=n

sum=0

while(n>0):

rem=n%10

sum=sum+(rem\*\*3)

n=n//10

if(sum==num):

print("armstrong no")

else:

print("not a armstrong no")

**OUTPUT:**

enter the number:153

armstrong no

28.Reversing a Number

**CODE:**

number = int(input("Enter the integer number: "))

revs\_number = 0

while (number > 0):

remainder = number % 10

revs\_number = (revs\_number \* 10) + remainder

number = number // 10

print("The reverse number is : {}".format(revs\_number))

**OUTPUT:**

Enter the integer number: 123

The reverse number is : 3

The reverse number is : 32

The reverse number is : 321

29.Print all the prime numbers from 1 -50

**CODE:**

lower\_value = int(input ("Enter the Lowest Range Value: "))

upper\_value = int(input ("Enter the Upper Range Value: "))

print ("The Prime Numbers in the range are: ")

for number in range (lower\_value, upper\_value + 1):

if number > 1:

for i in range (2, number):

if (number % i) == 0:

break

else:

print (number,end=",")

**OUTPUT:**

Enter the Lowest Range Value: 1

Enter the Upper Range Value: 50

The Prime Numbers in the range are:

2,3,5,7,11,13,17,19,23,29,31,37,41,43,47

30.Print all the leap year from 1900 – 2000

**CODE:**

startYear = int(input("Enter start year:"))

endYear = int(input("Enter end year:"))

for year in range(startYear,endYear):

if(year%4==0) and (year%100!=0) or (year%400==0):

print(year,end=" ")

**OUTPUT:**

Enter start year:1900

Enter end year:2001

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

**EXPLANATION OF PROGRAMS**:

1. The sequence is 1×2,2×3,3×4,4×5,5×6,6×7,......
2. The sequence is

1\*1 -1=0

2\*2 -2=2

3\*3 -1=8

4\*4 -2=14

5\*5 -1=24

6\*6 -2=34

1. a(first term)=1 and

d(common difference)=3

Sum of n elements of series = n\*(2a + (n-1)\*d)/2

4. 1\*1\*1=1=1\*1  
 1\*1\*1+2\*2\*2 = 9=3\*3  
 1\*1\*1+2\*2\*2+3\*3\*3=36=6\*6  
 1\*1\*1+2\*2\*2+3\*3\*3+4\*4\*4=100=10\*10

5. WKT formula for sum of continuous series that is n(n+1)2

2(n(n+1)2)

n(n+1)

50(51)

50×51=2550

Sum of this series is 2550

6.1o^n+i-10-9n/81

7. 1/2! = 1/2 = 0.5

2/3!= 2/(3\*2\*1) = 1/3 = 0.33

So the series becomes =0.5+0.33+0.125+0.033+0.006944…

8 .Fn=Fn-1+Fn-2

F0=0 and F1=1

Fibinocci series is 0,1,1,2,3,5,8

9. The sum of n terms of the series 1, 3, 5, 7, …… is n2

10.Sum of 1,2,3…n is n(n+1)/2

11. 1! + 2! + 3! + 4! + 5! = 1 + 2 + 6 + 24 + 120 = 153.

12. 9+99+999+9999+99999=10(105−1)−9(5)9=111105

25. Divide the number by 2.

Get the integer quotient for the next iteration.

Get the remainder for the binary digit.

Repeat the steps until the quotient is equal to 0

26.decimal = *d*0×2^o + *d*1×2^1 + *d*2×22^2+ ...

27. 153,370,371 and 407 are examples of Armstrong numbers

For 153, the operation is 1^3 5^3 3^3=153

For 370 the operation is 3^3 7^3 0^3=370

For 371 the operation is 3^3 7^3 1^3=371

For 407 the operation is 4^3 0^3 7^3=407

28. lastdigit = number % 10

reverse = (reverse \* 10) + lastdigit

number = number / 10

while (number > 0)