**PSPP ASSIGNMENT – 2**

**PROBLEMS ON CONTROL STATEMENTS**

**NUMBER SERIES:**

1. Write a program to print series 0,2,6,12,20,30,42,…,N

**SOURCE CODE:**

n = int(input("Enter no of terms : "))

i = 0

s = 0

while i<=n:

i = i+s

s = s+2

print(i, end = ', ')

**OUTPUT:**

Enter no of terms : 30

0, 2, 6, 12, 20, 30, 42,

1. Write a program to print series 0,2,8,14,24,34,…,N

**SOURCE CODE:**

n = int(input("Enter no of terms : "))

i =1

s =0

while i<= n:

if i%2==0:

s = (i\*\*2)-2

print(s,end = ', ')

else:

s = (i\*\*2)-1

print(s,end = ', ')

i = i+1

**OUTPUT:**

Enter no of terms : 8

0, 2, 8, 14, 24, 34, 48, 62,

1. Write a program to print Arithmetic Series 1,4,7,10…

**SOURCE CODE:**

n = int(input("Enter range of terms : "))

i = 1

print(i, end = ', ')

while i<=n:

i = i+3

print(i, end = ', ')

**OUTPUT:**

Enter range of terms : 30

1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31,

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

**SOURCE CODE:**

n = int(input("Enter no of terms : "))

s =0

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

s += i\*\*3

print(s)

**OUTPUT:**

Enter no of terms : 3

36

1. Write a program to find the sum of series 2+4+6+8…+N

**SOURCE CODE:**

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

sum = 0

i = 0

while i<=n:

sum+=i

i+=2

print("The Sum of Series: ",sum)

**OUTPUT:**

Enter the range: 8

The Sum of Series: 20

1. Write a program to find the sum of series 1+11+111+1111+….

**SOURCE CODE:**

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

sum = 0

j =1

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

sum =sum+j

j = (j\*10)+1

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

**OUTPUT:**

Enter value of n: 5

The sum of the series: 12345

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

**SOURCE CODE:**

n = int(input("Enter no of terms: "))

f =1

s =0

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

f = f\*(i+1)

s =s+(i/f)

print("Sum of the series : ",s)

**OUTPUT:**

Enter no of terms: 4

Sum of the series : 0.9916666666666666

1. Write a program to print Fibonacci series

**SOURCE CODE:**

f1 = int(input("Enter First term:"))

f2 = int(input("Enter Second term:"))

n = int(input("Enter no of terms:"))

print(f1)

print(f2)

i = 0

while i<n-2:

f3 = f1+f2

print(f3)

f1 = f2

f2 = f3

i = i+1

**OUTPUT:**

Enter First term:0

Enter Second term:1

Enter no of terms:8

0

1

1

2

3

5

8

13

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

**SOURCE CODE:**

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

sum = 0

i = 1

while i<=n:

sum+=i

i+=2

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

**OUTPUT:**

Enter the range : 51

Sum of the series: 676

1. Write a program to find the sum of series 1+2+3+4+5+…+N

**SOURCE CODE:**

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

sum = 0

i = 1

while i<=n:

sum+=i

i+=1

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

**OUTPUT:**

Enter the range : 28

Sum of the series: 406

1. Write a program to find the sum of series 1! + 2! +3! +4! +…+N!

**SOURCE CODE:**

n = int(input("Enter no of terms: "))

t =0

fact = 1

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

fact \*= i

t = t+fact

print("Sum of the series: ",t)

**OUTPUT:**

Enter no of terms: 5

Sum of the series: 153

1. Write a program to find the sum of series 9+99+999+9999+…

**SOURCE CODE:**

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

sum = 0

j =9

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

sum =sum+j

j = (j\*10)+9

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

**OUTPUT:**

Enter value of n: 2

The sum of the series: 108

**NUMBER PATTERNS**

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

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

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

for j in range(i):

print (i, end=" ")

print()

OUTPUT:

Enter no of rows:6

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

6 6 6 6 6 6

1. Pyramid pattern of numbers

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

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

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

print (j, end=" ")

print()

**OUTPUT:**

Enter no of rows:4

1

1 2

1 2 3

1 2 3 4

1. Inverted Pyramid pattern of numbers

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

for i in range(n+1,0,-1):

for j in range(1, i):

print (j, end=" ")

print()

**OUTPUT:**

Enter no of rows:6

1 2 3 4 5 6

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

1. Inverted Pyramid pattern with same digit

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

for i in range(n+1,0,-1):

for j in range(1, i):

print (n, end=" ")

print()

**OUTPUT:**

Enter no of rows:5

5 5 5 5 5

5 5 5 5

5 5 5

5 5

5

1. Alternate Number Pattern using while loop:

**SOURCE CODE:**

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

num = 1

while num <= n:

for i in range(num):

if num%2 != 0:

print(num, end=" ")

num += 1

print()

**OUTPUT:**

Enter value:10

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

1. Reverse Pyramid of numbers

**SOURCE CODE:**

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: 5

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

**PYRAMID PATTERN:**

1. Simple half pyramid pattern

**SOURCE CODE:**

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

for i in range(n+1):

for j in range(i):

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

print('')

**OUTPUT:**

Enter value of n:6

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

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

1. Downward half pyramid pattern

**SOURCE CODE:**

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

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

for j in range(0,i):

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

print()

**OUTPUT:**

Enter value of n:6

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

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

1. Downward full pyramid pattern

**SOURCE CODE:**

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

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

for s in range(0,n-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 the number of rows: 5

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

\* \* \* \* \*

\* \* \*

\*

1. Right down mirror star pattern

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

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

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

if j<i:

print(' ',end = ' ')

else:

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

print()

**OUTPUT:**

Enter no of rows:5

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

1. Equilateral triangle pattern

**SOURCE CODE:**

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: 4

\*

\* \* \*

\* \* \* \* \*

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

1. Right star pattern

**SOURCE CODE:**

n = int(input("Enter no of rows:"))

for i in range(0,n):

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

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

print()

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

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

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

print()

**OUTPUT:**

Enter no of rows:5

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

**PROBLEMS:**

1. Convert decimal to binary

**SOURCE CODE:**

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: 24

The binary value is: 11000

1. Convert binary to decimal

**SOURCE CODE:**

binary= int(input("Input a binary number: "))

decimal,i = 0,0

while (binary !=0):

dec = binary%10

decimal = decimal+dec\*pow(2,i)

binary = binary//10

i+=1

print(decimal)

**OUTPUT:**

Input a binary number: 11000

24

1. Check the given number is Armstrong number

**SOURCE CODE:**

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

sum=0

t=n

while t>0:

d=t%10

sum+=d\*\*3

t//=10

if n==sum:

print(n,"is an Armstrong number")

else:

print(n,"is not an Armstrong number")

**OUTPUT:**

Enter a number: 153

153 is an Armstrong number

1. Reversing a number

**SOURCE CODE:**

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: 568

Reversed Number: 865

1. Print all prime numbers from 1-50

**SOURCE CODE:**

a = 0

b = 50

for num in range(a, b + 1):

if num > 1:

for i in range(2, num):

if (num % i) == 0:

break

else:

print(num,end = ' ')

**OUTPUT:**

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

1. Print all the leap year from 1900-2000

**SOURCE CODE:**

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