**VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY, MADURAI-625 009**

(An Autonomous Institution)

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**Year/Sem/Sec :** I / I / B

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**Date** : 06.01.2023

**Due Date :** 11.01.2023

**PROBLEM SOLVING AND PYTHON PROGRAMMING**

**ASSIGNMENT II**

**Rubrics for Evalution**

|  |  |  |  |
| --- | --- | --- | --- |
| Problem / Concept  Identification(5) | Program &  Explanation(10) | Timely Submission  (3) | Web reference  (2) |
|  |  |  |  |

**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

1. write the program for arithmetic series 1 4 7 10..…

**CODE:**

series = [1, 4, 7]

for i in range(3,30):

series.append(series[i-1] + 3)

print(series)

**OUTPUT:**

[1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 88]

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

**CODE:**

n=int(input("enter n value"))

i=0

sum=0

while(i<=n):

print(i)

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

i=i+1

print("the sum is:",sum)

**OUTPUT**

enter n value5

0

the sum is: 0

1

the sum is: 1

2

the sum is: 9

3

the sum is: 36

4

the sum is: 100

5

the sum is: 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:6

the sum of the series= 12

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

**CODE:**

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: 5

54321

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

**CODE:**

n=int(input("enter number of terms"))

f=1

s=0

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

f=f\*(i+1)

s=s\*(i/f)

print("sum:",s)

**OUTPUT**

enter number of terms4

sum: 0.0

8. Write a Program to print the Fibonacci series.

**CODE:**

f1=int(input("enter first value"))

f2=int(input("enter second value"))

n=int(input("enter 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 first value0

enter second value1

enter n value8

0

1

1

2

3

5

8

13

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

**CODE:**

n=int(input("enter n value"))

i=1

sum=0

while(i<=n):

print(i)

sum=sum+i

i=i+2

print("the sum is:",sum)

**OUTPUT:**

enter n value5

1

the sum is: 1

3

the sum is: 4

5

the sum is: 9

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

**CODE:**

n=int(input("enter n value"))

i=0

sum=0

while(i<=n):

print(i)

sum=sum+i

i=i+1

print("the sum is:",sum)

**OUTPUT**

enter n value5

0

the sum is: 0

1

the sum is: 1

2

the sum is: 3

3

the sum is: 6

4

the sum is: 10

5

the sum is: 15

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

**CODE:**

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: 7

The sum of the series is 5913

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

**CODE:**

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**

1. 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

2.how to print the following half pyramid pattern of numbers

n=5

**CODE:**

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

1 2 3 4 5

3. 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

4. Inverted Pyramid pattern with the same digit

**CODE:**

rows=int(input("enter the number of rows"))

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

for j in range (0,i):

print("5",end=" ")

print(" ")

**OUTPUT:**

5 5 5 5 5

5 5 5 5

5 5 5

5 5

5

5. Alternate numbers pattern using while loop

**CODE:**

n=5

x=1

for i in range(1,6):

for j in range(i):

print(x,end=" ")

x+=2

print()

**OUTPUT:**

1

3 3

5 5 5

7 7 7 7

9 9 9 9 9

6.write a python code for reverse pyramid of numbers.

**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

**PYRAMID PATTERN**

1. Simple half pyramid pattern:

**CODE:**

for i in range(0,5):

print()

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

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

**OUTPUT:**

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

2.write a python code for downward half-pyramid pattern for using star.

**CODE:**

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: 5

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

3. Downward full Pyramid Pattern of star

**CODE:**

rows=int(input("enter a no"))

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

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

print(end=" ")

for k in range(0,i):

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

print()

**OUTPUT:**

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

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

4. Right down mirror star Pattern

**CODE:**

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

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

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

print(end=" ")

for j in range(0,i):

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

print()

**OUTPUT:**

Enter number of rows:5

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

5. Equilateral triangle pattern of star

**CODE:**

num\_rows = int(input("Enter the number of rows"));

for i in range(0, num\_rows):

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

print(end=" ")

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

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

print()

**OUTPUT:**

Enter the number of rows4

\*

\* \*

\* \* \*

\* \* \* \*

6. Right start pattern of star

**CODE:**

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

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:**

Enter range value:5

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

**PROBLEMS:**

1. 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

2.write a python code for binary to decimal number.

**CODE:**

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

3) CHECK THE GIVEN NUMBER IS ARMSTRONG OR NOT

**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

4. Reversing a Number

**CODE:**

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

num=n

sum=0

while(n>0):

rem=n%10

sum=(sum\*10)+rem

n=n//10

print("reverse of a number:",sum)

**OUTPUT**

enter the number651

reverse of a number: 1

reverse of a number: 15

reverse of a number: 156

5. Print all the prime numbers from 1 -50

5.write a python code for print the all prime numbers 1-50.

**CODE:**

n=1

while(n<=50):

count=0

i=2

while(i<=n//2):

if(n%i==0):

count=count+1

break

i=i+1

if(count==0 and n!=1):

print("%d"%n,end=" ")

n=n+1

**OUTPUT:**

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

6. 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

**REFERENCE:**

* Geeksforgeeks
* Pythonprogramming.net
* pythonguides.com
* [www.sanfoundry.com](http://www.sanfoundry.com)
* www.tutsmake.com