1. Write programs in Python to display following sequences for n terms (for loop):	2. Write programs in Python to find and display the sum of the following series for n terms (for loop):
(a) **1, 2, 3, ... N Terms**	(a) **1+ 2+ 3+ ... N Terms**
(b) **2, 4, 6, ... N Terms**	(b) **2+ 4+ 6+ ... N Terms**
(c) **1, 5, 9, ... N Terms**	(c) **1+ 5+ 9+ ... N Terms**
(d) **X, X^2, X^3, ... N Terms**	(d) **X+ X^2+ X^3+ ... N Terms**
(e) **X, X^2/2!, X^3/3!, ... N Terms**	(e) **X+ X^2/2! + X^3/3!+ ... N Terms**
(f) **X, -X^2/2!, X^3/3!, ... N Terms**	(f) **X-X^2/2!+ X^3/3! - ... N Terms**
(g) **1, (1+2), (1+2+3), ... N Terms**	(g) **1+(1+2)+(1+2+3)+ ... N Terms**
(h) **2, (2+4), (2+4+6), ... N Terms**	(h) **2+ (2+4)+ (2+4+6)+ ... N Terms**

Answer:

```
# ------------------------------------------------------------#
# List-Program No     : L2-P1
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------#
```

a.

```
N = int(input("Enter a number: "))

for i in range(1,N+1,1):
  print(i)
```

b.

```
N = int(input("Enter a number: "))

for i in range(2,(2*N)+1,2):
  print(i)
```

c.

```
N = int(input("Enter a number: "))

for i in range(1,(2*N)+1,2):
  print(i)
```

d.

```
X=int(input("enter the base value"))
N=int(input('enter the number of terms'))
for i in range(1,N+1,1):
  print(X**i)
```

e.

```
X = int(input("Enter the base X: "))
n = int(input("Enter the number of terms: "))
S = X
P = 1
for i in range(2, n+1):
    P *= i
    S = X**i / P
    print(S, end=' ')
```

f.
```
X = int(input("Enter the base X: "))
n = int(input("Enter the number of terms: "))

r = X
f = 1
s = 1

print(r, end=' ')
for i in range(2, n+1):
    f *= i
    r = (X**i / f) * s
    s *= -1
    print(r, end=' ')
```

g.
```
 n = int(input("Enter the number of terms: "))
c = 0
for i in range(1, n+1):
    c += i
    print(c)
```

h.
```
n = int(input("Enter the number of terms: "))
c = 0
for i in range(1, n+1):
    c += 2 * i
    print(c)
```

Answer 2:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P2
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
```

a.
```
n = int(input("Enter the number of terms for series: "))
s = 0
for i in range(1, n+1):
    s += i
```

b.
```
n = int(input("Enter the number of terms for series: "))
s = 0
for i in range(1, n+1):
    s += 2*i
print("Sum of the series :", s)
```

c.
```
n = int(input("Enter the number of terms for series : "))
s = 0
t = 1
for i in range(n):
    s += t
    t += 4
print("Sum of the series :", s)
```

d.
```
X = int(input("Enter the base X for series: "))
n = int(input("Enter the number of terms for series : "))
s = 0
p = 1
for i in range(1, n+1):
    p *= X
    s += p

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

e.
```
X = int(input("Enter the base X for series : "))
n = int(input("Enter the number of terms for series : "))
s = 0
f = 1
for i in range(1, n+1):
    f *= i
    s += X**i / f

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

f.
```
X = int(input("Enter the base X for series: "))
n = int(input("Enter the number of terms for series : "))
s = 0
f = 1
s = 1
for i in range(1, n+1):
    f *= i
    s += (X**i / f) * s
    s *= -1

print("Sum of the serie :", s)
```

g.
```
n = int(input("Enter the number of terms for series : "))
s = 0
c = 0
for i in range(1, n+1):
    c += i
    s += c

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

h.
```
n = int(input("Enter the number of terms for series (h): "))
s = 0
c = 0
for i in range(1, n+1):
    c += 2 * i
    s += c

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

3. Write a program in Python to check if a number (integer) entered by the user is PRIME or not.

Solution:

```
      # -----------------------------------------------------------------#
      # List-Program No     : L2-P3
      # Developed By        : Shesh Shiromani
      # Date                : 16-August-2024
      # -----------------------------------------------------------------#
      N=int(input("Enter a Number:"))
      for i in range(2,N//2+1):
        if N%i==0:
          print(N,"Is Not A Prime Number")
          break
      else:
        print(N, "is Prime")
```

Output:

```
      Enter a Number:17
      17 is Prime
```

---

4. Write a program in Python to check if a number (integer) entered by the user is COMPOSITE or not.

Solution:

```
      # -----------------------------------------------------------------#
      # List-Program No     : L2-P4
      # Developed By        : Shesh Shiromani
      # Date                : 16-August-2024
      # -----------------------------------------------------------------#

      N=int(input("Enter a Number:"))
      for i in range(2,N//2+1):
        if N%i==0:
          print(N,"Is Composite")
          break
      else:
        print(N, "is not Composite")
```

Output:

```
      Enter a Number:22
      22 Is Composite
```

5. Write a program in Python to print first N PRIME numbers, where the value of N to be entered by the user.

Answer:

```
# -----------------------------------------------------------------#
# List-Program No     : L2-P5
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# -----------------------------------------------------------------#
n = int(input("Enter the value of N: "))
s = 0
p = 2

while s < n:
    y = 0
    for i in range(2, p):
        if p % i == 0:
            y = 1
            break
    if y == 0:
        print(p)
        s += 1
    p += 1
```

Output:

```
Enter the value of N: 5
2
3
5
7
11
```

---

6. Write a program in Python to print PRIME numbers between 1 to N, where the value of N to be entered by the user.

Solution:

```
# -----------------------------------------------------------------#
# List-Program No     : L2-P6
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# -----------------------------------------------------------------#
n = int(input("Get all the primes between 1 and n "))
for j in range(2,n+1):
  for i in range(2, int(j**(1/2))+1):
    if j%i==0:
      break
  else:
    print(j, end = ",")
```

Output:

```
Get all the primes between 1 and n 20
2,3,5,7,11,13,17,19,
```

7. Write a program in Python to check if an integer N entered by the user is an **ARMSTRONG** number of not.

Note: The **ARMSTRONG** number is a number, whose sum of individual digits raised to the power of the digit count is equal to the original number itself . Examples: **0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 153, 370, 371, 407, 1634** etc. are armstrong numbers
As $1^1=1$, $9^1=9$, $1^3+5^3+3^3=153$, $1^4+6^4+3^4+4^4=1634$
There is no 2 digit ARMSTRONG number

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P7
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
n = int(input("Check if the number is armstrong or not "))
original = n
sum = 0
count = len(str(n))
while n>0:
  curr = n%10
  sum+=(curr**count)
  n//=10
if original == sum:
  print('It is an Armstrong Number')
else:
  print("It is not an Armstrong Number")
```

Output:

```
Check if the number is armstrong or not 13
It is not an Armstrong Number
```

---

8. Write a program to print all the **ARMSTRONG** numbers between 1 to N, where the value of N to be entered by the user.

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P8
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
n = int(input("Get all the armstrong numbers between 1 and n "))
for i in range(1,n+1):
  original = i
  sum = 0
  count = len(str(i))
  while i>0:
    curr = i%10
    sum+=(curr**count)
    i//=10
  if original == sum:
    print(sum, end=' ')
```

Output:

```
Get all the armstrong numbers between 1 and n 8
1 2 3 4 5 6 7 8
```

9. Write a program in Python to reverse digits of an integer N and display the digits in the reversed order in the same line with each digit ending with # .
Enter N:345

5 # 4 # 3 #

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P9
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
n = input("Enter N:")
r = n[::-1]
for d in r:
    print(d, end =' # ')
```

Output:

```
Enter N:998
8#9#9#
```

---

10. Write a program in Python to find a new number, which carries reversed digits of an integer N.

Enter N:345
M (Reversed content of N): 543

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P10
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
n = input("Enter N:")
m = n[::-1]
print("M (Reversed content of N):", m)
```

Output:

```
Enter N:1097
M (Reversed content of N): 7901
```

11. Write a program in Python to check if a new number N entered by the user is Palindrome or not. Palindrome is a number, which remains the same when its digits are reversed.

Enter N:345
345 is not a palindrome
More numbers to check (Y/N)? Y

Enter N: 12321
12321 is a Palindrome
More numbers to check (Y/N)?

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P11
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
N = int(input("Enter value of N:"))
TN = N
RN = 0
while N>0:
  RN=RN*10+N%10
  N//=10
if TN==RN:
  print(TN,"is a palindrome")
else:
  print(TN,"is not a palindrome")
```

Output:

```
Enter value of N:1298
1298 is not a palindrome
```

---

12. Write a program in Python to add those digits of an integer N, which are on odd positions.

Enter N:1834
Sum of odd positions:4
More numbers (Y/N):Y

Enter N: 24192
Sum of odd positions:5
More numbers (Y/N):N

Solution:

```
# ------------------------------------------------------------------#
# List-Program No     : L2-P12
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------------#
while True:

  N=int(input("Enter a number: "))
  S=str(N)
  c=0
  for i in range (0,len(S),2):
    c+=int(S[i])
  print("The sum of the digits at odd places are: ", c)
  R=str(input("Run Again?(Y/N)"))
  if R=='N':
    print("Thank You")
    break
```

Output:

```
Enter a number: 1274638
The sum of the digits at odd places are:  22
Run Again?(Y/N)N
Thank You
```

13. Write a program in Python to find all the factors of a given number (integer).

```
      Enter N:18                              Enter N: 24
1,2,3,6,9,18                          1,2,3,4,6,8,12,24
Factors required for More(Y/N)? Y  Factors required for More(Y/N)? N
```

Solution:

```
# ------------------------------------------------------------#
# List-Program No     : L2-P13
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------#
while True:
  more = input('\nGet factors of numbers ')
  if not more.upper()=='Y':
    break
  n = int(input("Enter the numbers you want factors of "))
  print('factors are', end=': ')
  for i in range(1,n+1):
    if n%i==0:
      print(i, end='  ')
```

---

14. Write a program in Python to find all the HCF of two given numbers (integers).

```
      Enter N:12                              Enter N: 24
      Enter M:18                              Enter M: 16
HCF    :6                               HCF    : 8
HCF required for More(Y/N)? Y       HCF required for More(Y/N)? N
```

Solution:

```
# ------------------------------------------------------------#
# List-Program No     : L2-P14
# Developed By        : Shesh Shiromani
# Date                : 16-August-2024
# ------------------------------------------------------------#
A=int(input("A:"))
B=int(input("B:"))
HCF=1
MIN=min(A,B)
for I in range(1,MIN+1):
  if A%I==0 and B%I==0:
    HCF=I
print("HCF of",A,"and",B,"is",HCF)
```

Output:

```
A:100
B:7264
HCF of 100 and 7264 is 4
```

15. Write a program in Python to find the LCM of two given numbers (integers).

```
      Enter N:12                          Enter N: 24
      Enter M:18                          Enter M: 16
LCM    :36                          HCF    : 48
LCM required for More(Y/N)? Y       LCM required for More(Y/N)? N
```

Solution:

```
      # ------------------------------------------------------------#
      # List-Program No     : L2-P15
      # Developed By        : Shesh Shiromani
      # Date                : 16-August-2024
      # ------------------------------------------------------------#
A=int(input("A:"))
B=int(input("B:"))
HCF=1
MIN=min(A,B)
for I in range(1,MIN+1):
  if A%I==0 and B%I==0:
    HCF=I
print("LCM of",A,"and",B,"is",A*B//HCF)
```

Output:

```
      A:18373
      B:22
      LCM of 18373 and 22 is 404206
```

---

16. Write a program in Python to perform operations (Addition, Subtraction, Multiplication, Division) on several sets of two integers.

```
      Enter A:12                          Enter A:120
      Enter B:18                          Enter B:30
Operation +,-,*,/ :+                Operation +,-,*,/ :*
Result: 30                          Result: 3600
More Operations (Y/N)? Y            More Operations (Y/N)? N
```

Solution:

```
while True:
  A = int(input("Enter A: "))
  B = int(input("Enter B: "))
  O = input("Operation +,-,*,/ :
")
  if O=="+":
    print("Result=",A+B)
  elif O=="-":
    print("Result=",A-B)
  elif O=="*":
    print("Result=",A*B)
  elif O=="/":
    print("Result=",A/B)
  else:
    print("Error")
  ch = input('More
Operations?(Y/N)')
  if(ch=='N'):
    break
```

Output:

```
Enter A: 123
Enter B: 2
Operation +,-,*,/ : +
Result= 125
More Operations?(Y/N)N
```

17. Write a program in Python to find the area of various 2D objects as per the user's choice.

```
      Object Shape [S:Square R:Rectangle C:Circle Q:Quit]:S
Enter Side:12
      Area of Square:144
      Object Shape [S:Square R:Rectangle C:Circle Q:Quit]:R
Enter Length:12
Enter Breadth:8
      Area of Rectangle:96
      Object Shape [S:Square R:Rectangle C:Circle Q:Quit]:C
Enter Radius:5
      Area of Circle:78.54
      Object Shape [S:Square R:Rectangle C:Circle Q:Quit]:Q
      Thanks
```

Solution:

```
while True:
  X=str(input("Object Shape[S:Square R:Rectangle C:Circle Q:Quit]: "))
  if X=="S":
    A=int(input("Enter Side: "))
    print("Area of Square: ",A*A)
  elif X=="R":
    A=int(input("Enter Length: "))
    B=int(input("Enter Breadth: "))
    print("Area of Rectangle: ",A*B)
  elif X=="C":
    A=int(input("Enter Radius: "))
    print("Area of Circle: ",(3.14)*A*A)
  elif X=="Q":
    print("Thanks For Using!")
    break
  else:
    print("Invalid Input")
```

Output:

```
Object Shape[S:Square R:Rectangle C:Circle Q:Quit]: R
Enter Length: 24
Enter Breadth: 3
Area of Rectangle:  72
Object Shape[S:Square R:Rectangle C:Circle Q:Quit]: Q
Thanks For Using!
```

ntation **2 Character** only.