1: Write a program (WAP) that will print following series up to Nth terms.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, ...

```
N = int(input("Enter the value of N: "))

count = 1

while count<N:
  print(count,end=',')
  count+=1
print(count)
```

```
Enter the value of N: 2
1,2
```

```
N = int(input("Enter the value of N: "))

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

```
Enter the value of N: 2
1, 2,
```

```
N = int(input("Enter the value of N: "))

for i in range(1, N):
    print(i, end=", ")

print(N)
```

```
Enter the value of N: 2
1, 2
```

```
N = int(input("Enter the value of N: "))

i = 1

while i <=N:
  print(i,end= ',')
  i+=1
```

```
Enter the value of N: 5
1,2,3,4,5,
```

2: Write a program (WAP) that will print following series upto Nth terms.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 .....

```
#Wrong

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

for i in range(1, N + 1,2):
    print(i, end=", ")
```

```
Enter the value of N: 11
1, 3, 5, 7, 9, 11,
```

```
N = int(input("Enter the value of N: "))

# Iterate from 1 to N with a step of 2
for i in range(1, N * 2, 2):
    print(i, end=", ")

# Output: 1, 3, 5, 7, 9, 11, ...
```

```
 Enter the value of N: 11
 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,
```

```
N = int(input("Enter the value of N: "))

# Iterate from 1 to N with a step of 2
for i in range(1, N * 2, 2):
    if i < N * 2 - 1:
        print(i, end=", ")
    else:
        print(i)
```

```
 Enter the value of N: 11
 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21
```

```
N = int(input("Enter the value of N: "))

i = 1
j = 1
while j <=N:
  print(i,end= ',')
  i+=2
  j+=1
```

```
 Enter the value of N: 11
 1,3,5,7,9,11,13,15,17,19,21,
```

3: Write a program (WAP) that will print following series upto Nth terms.

1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, ……

```
#Wrong

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

for i in range(1,N+1,2):
  print(1,end=',')
  for i in range(2,N+1,2):
    print(0)
```

```
#Wrong

N = int(input("Enter the value of N: "))
term = 1
while term <=N:
  print(1,0,end=',')
  term = term+1
```

```
 Enter the value of N: 2
 1 0,1 0,
```

```
N = int(input("Enter the value of N: "))

for i in range(N):
    if i % 2 == 0:
        print("1", end=", ")
    else:
        print("0", end=", ")
```

```
 Enter the value of N: 3
 1, 0, 1,
```

```
N = int(input("Enter the value of N: "))

for i in range(N):
    if i % 2 == 0:
        print("1", end="")
    else:
        print("0", end="")

    if i < N - 1:
        print(", ", end="")
```

```
 Enter the value of N: 5
 1, 0, 1, 0, 1
```

```
N = int(input("Enter the value of N: "))

i = 0
while i<N:
  if i%2==0:
    print(1,end=",")
  else:
    print(0,end=',')
  i+=1
```

```
 Enter the value of N: 2
 1,0,
```

4:Write a program (WAP) that will take N numbers as inputs and compute their average.

(Restriction: Without using any array)

```
N = int(input("Enter the value of N: "))
i = 1
total = 0
while i<=N:
  numbers = float(input())
  total = numbers+total
  i+=1
print(f"AVG of {N} inputs: {total/N}")
```

```
 Enter the value of N: 2
 22.4
 11.1
 AVG of 2 inputs: 16.75
```

```
N = int(input("Enter the value of N: "))
total = 0
for i in range(N):
  numbers = float(input())
  total = numbers+total
print(f"AVG of {N} inputs: {total/N}")
```

```
 Enter the value of N: 3
 10
 20
 30.5
 AVG of 3 inputs: 20.166666666666668
```

5:Write a program (WAP) that will take two numbers X and Y as inputs. Then it will print the square of X and increment (if X<Y) or decrement (if X>Y) X by 1, until X reaches Y. If and when X is equal to Y, the program prints “Reached!”

```
#Wrong

X = int(input("Enter the value of X: "))
Y = int(input("Enter the value of Y: "))
if X==Y:
  print('Reached!')
while X<=Y:
  if X==Y:
    print('Reached!')
    break
  elif X<Y:
    print(X**2,end=',')
    X+=1
while X>=Y:
  if X==Y:
    print('Reached!')
    break
  elif X>Y:
    print(X**2,end=',')
    X-=1
```

```
Enter the value of X: 10
Enter the value of Y: 10
Reached!
Reached!
```

```
#Wrong

X = int(input("Enter the value of X: "))   # X = 10
Y = int(input("Enter the value of Y: "))   # Y = 5
while X==Y:                   #False
  print('Reached!')
  break
while X<Y:          #false
    print(X**2,end=',')
    X+=1
print('Reached!')
while X>Y:
    print(X**2,end=',')
    X-=1
print('Reached!')
```

```
Enter the value of X: 10
Enter the value of Y: 5
Reached!
100,81,64,49,36,Reached!
```

```
# Input two numbers X and Y
X = int(input("Enter the value of X: "))
Y = int(input("Enter the value of Y: "))

# Square of X and increment/decrement until X reaches Y
while X != Y:
    print(X ** 2,end =',')
    if X < Y:
        X += 1
    else:
        X -= 1

# Print "Reached!" when X is equal to Y
print("Reached!")
```

```
Enter the value of X: 5
Enter the value of Y: 10
25,36,49,64,81,Reached!
```

6:Write a program (WAP) for the described scenario:

Player-1 picks a number X and Player-2 has to guess that number within N tries. For each wrong guess by Player-2, the program prints “Wrong, N-1 Choice(s) Left!” If Player-

2 at any time successfully guesses the number, the program prints “Right, Player-2 wins!” and terminates right away. Otherwise after the completion of N wrong tries, the program prints “Player-1 wins!” and halts.

(Hint: Use break/continue)

```
N = 3
flag = True

while flag:
  Player1 = int(input('picks a number(0-9): '))
  if 0<=Player1<=9:
    for i in range(100):
      print("Don't try to scroll up" )
    while N!=0:
      Player2 = int(input('Guess the number: '))
      if Player2 == Player1:
        print('Right,Player2 wins!')
        flag = False
        break
      elif Player2 != Player1:
        N-=1
        print(f'Wrong, {N} Choice(s) Left!')
    else:
      print('Player1 wins!')
      flag = False
      break
```

7: Write a program (WAP) that will run and show keyboard inputs until the user types an ’A’ at the keyboard.

```
valid = True

while valid:
  X = input("Enter the value of X: ")
  if X != "A":
    print(X)
  else:
    valid = False
```

```
Enter the value of X: a
a
Enter the value of X: 1
1
Enter the value of X: a
a
Enter the value of X: X
X
Enter the value of X: A
```

8:Write a program (WAP) that will reverse the digits of an input integer

```
X = input("Enter the value of X: ")

a = list(X)

a.reverse()

#print(a)

for i in a:
  print(i,end='')
```

```
Enter the value of X: 67458
85476
```

```
test_list = ['1', '4', '3', '6', '7']

# using loop
for i in range(0, len(test_list)):
    test_list[i] = int(test_list[i])

# Printing modified list
print("Modified list is : " + str(test_list))
```

```
Modified list is : [1, 4, 3, 6, 7]
```

```
# Input an integer
num = int(input("Enter an integer: "))

# Initialize variables
reversed_num = 0
original_num = num

# Reverse the digits
while num > 0:
    digit = num % 10
    reversed_num = (reversed_num * 10) + digit
    num //= 10

# Print the reversed number
print("Original number:", original_num)
print("Reversed number:", reversed_num)
```

Can't Understand

```
# Input an integer
num = int(input("Enter an integer: "))

# Convert the integer to a string and reverse it using slicing
reversed_num = int(str(num)[::-1])

# Print the reversed number
print("Original number:", num)
print("Reversed number:", reversed_num)
```

```
Enter an integer: 1234
Original number: 1234
Reversed number: 4321
```

9:

Write a program (WAP) that will find the grade of **N** students. For each student, it will take the marks of his/her the attendance (on 5 marks), assignment (on 10 marks), class test (on 15 marks), midterm (on 50 marks), term final (on 100 marks). Then based on the tables shown below, the program will output his grade.

Attendance (A)	5%
Assignments (HW)	10%
Class Tests (CT)	15%
Midterm (MT)	30%
Final (TF)	40%

Marks	Letter Grade	Marks	Letter Grade	Marks	Letter Grade
90-100	A	70-73	C+	Less than 55	F
86-89	A-	66-69	C		
82-85	B+	62-65	C-		
78-81	B	58-61	D+		
74-77	B-	55-57	D		

```
N = int(input("Enter the number of students: "))
i = 1
while i <=N:
  Attendance = int(input())
  Assignments = float(input())
  Class_Tests = float(input())
  Midterm = float(input())
  Final = float(input())
  total =  Attendance +Assignments+Class_Tests+Midterm+Final
  print(f'Total: {total}')
  if(total>=90 and total<=100 ):
    print(f'Student{i}: A')
  elif(total>=86 and total<=89):
    print(f"Student{i}:  A-")
  elif(total>=82 and total<=85):
    print(f"Student{i}:  B+")
  elif(total>=78 and total<=81):
    print(f"Student{i}:  B")
  elif(total>=74 and total<=77):
    print(f"Student{i}:  B-")
  elif(total>=70 and total<=73):
    print(f"Student{i}:  C+")
  elif(total>=66 and total<=69):
    print(f"Student{i}:  C")
  elif(total>=62 and total<=65):
    print(f"Student{i}:  C-")
  elif(total>=58 and total<=61):
    print(f"Student{i}:  D+")
  elif(total>=55 and total<=57):
    print(f"Student{i}:  D")
  else:
    print(f"Student{i}:  F")
  i+=1
```

```
Enter the number of students: 2
5
10
15
30
40
Total: 100.0
Student1: A
0
7.5
5
10
10
Total: 32.5
Student2:  F
```

10: Write a program (WAP) that will give the sum of first N th terms for the following series.

1, -2, 3, -4, 5, -6, 7, -8, 9, -10, 11, -12, 13,-14, …….

```
# Input the value of N
N = int(input("Enter the value of N: "))

# Initialize the sum
total_sum = 0

# Loop to calculate the sum of the series
for i in range(1, N + 1):
    if i % 2 == 0:
        total_sum -= i
    else:
        total_sum += i

# Print the sum of the series
print("Sum of the first", N, "terms of the series:", total_sum)
```

```
Enter the value of N: 3
Sum of the first 3 terms of the series: 2
```

```
N = int(input("Enter the number of term: "))      # N =3
total1 = 0
total2 = 0
for i in range(1,N+1,2):     # for i in range(1,4,2)
  total1 = total1 + i
  #i = i +2                   # i = i + 2             i =1+2 =3
for j in range(-2,-(N+1),-2):#for j in range(-2,-4,-2)
  total2 = total2 + j
  #j = j - 2                  # j = j - 2
print(f'Result: {total1+total2}')
```

```
Enter the number of term: 6
Result: -3
```

```
# Input the value of N
N = int(input("Enter the value of N: "))

# Initialize the sum
total_sum = 0

# Loop to calculate the sum of the series
for i in range(1, N + 1):
    if i % 2 == 0:
        total_sum -= i
    else:
        total_sum += i

# Print the sum of the series
print("Sum of the first", N, "terms of the series:", total_sum)
```

11:Write a program (WAP) that will calculate the result for the first Nth terms of the following series.

[In that series sum, dot sign (.) means multiplication]

1^2.2 + 2^2.3 + 3^2.4 + 4^2.5 + …….

```
N = int(input("Enter the number of term: "))
total = 0
for i in range(1,N+1):
  total = total + ((i**2)*(i+1))
print(total)
```

```
Enter the number of term: 7
924
```

```
N = int(input("Enter the number of term: "))
i = 1
total = 0
while i <= N:
  total = total + ((i**2)*(i+1))
  i+=1
print(total)
```

```
Enter the number of term: 7
924
```

12:Write a program (WAP) that will print Fibonacci series upto Nth terms.

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, …….

```
n_terms = int(input ("How many terms the user wants to print? "))


n_1 = 0
n_2 = 1



if n_terms <= 0:
    print ("Please enter a positive integer, the given number is not valid")

elif n_terms == 1:
    print ("The Fibonacci sequence of the numbers up to", n_terms, ": ")
    print(n_2)

for i in range(n_terms):        # for i in range(4)
        nth = n_1 + n_2         # nth = 0+1
        n_1 = n_2               # n_1 = n_2     n_1 = 1
        n_2 = nth               # n_2 = 1
        print(n_1,end=',')


     How many terms the user wants to print? 7
     1,1,2,3,5,8,13,


n_terms = int(input ("How many terms the user wants to print? "))

# First two terms
n_1 = 0
n_2 = 1
count = 0

# Now, we will check if the number of terms is valid or not
if n_terms <= 0:
    print ("Please enter a positive integer, the given number is not valid")
# if there is only one term, it will return n_1
elif n_terms == 1:
    print ("The Fibonacci sequence of the numbers up to", n_terms, ": ")
    print(n_2)
# Then we will generate Fibonacci sequence of number
else:
    print ("The fibonacci sequence of the numbers is:")
    while count < n_terms:
        nth = n_1 + n_2
        n_1 = n_2
        n_2 = nth
        print(n_1,end=',')

       # At last, we will update values


        count += 1

     How many terms the user wants to print? 11
     The fibonacci sequence of the numbers is:
     1,1,2,3,5,8,13,21,34,55,89,
```

13: Write a program (WAP) that will print the factorial (N!) of a given number N. Please see the sample input output.

```
N = int(input("Enter the number of term: "))
fact = 1

for i in range(1,N+1):
  #total = 1*i
  fact = i*fact
print(fact)

     Enter the number of term: 4
     24
```

```
N = int(input("Enter the number of term: "))
i = 1
fact = 1

while i <=N:
  fact = fact*i
  i+=1
print(fact)
```

```
Enter the number of term: 4
24
```

Difference between permutation and combination

PERMUTATION	COMBINATION
Permutation refers to the different ways of arranging a set of objects in a sequential order.	Combination refers to several ways of choosing items from a large set of objects, such that their order does not matters.
Relevant	Irrelevant
Arrangement	Selection
Ordered elements	Unordered sets
How many different arrangement can be created from a given set of objects?	How many different groups can be chosen from a larger group of objects?
Multiple permutation from a single combination.	Single combination from a single permutation.

2. Write a C program that will take as input two integers n and r, and calculate ${}^{n}P_{r}$.

Sample input	Sample output
6 2	30
8 3	336

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

d = n-r

n_factorial = 1
d_factorial = 1

for x in range(1,n+1):
  n_factorial = n_factorial*x
for x in range(1,d+1):
  d_factorial = d_factorial*x
print(n_factorial/d_factorial)
```

14:

Write a program (WAP) that will find ${}^{n}C_{r}$ where **n >= r**; **n** and **r** are integers.

Sample input	*Sample output*
5 2	10
10 3	120
7 7	1
6 1	6

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

d = n-r

n_factorial = 1
d_factorial = 1
r_factorial = 1

if n>=r:
    for x in range(1,n+1):
      n_factorial = n_factorial*x
    for x in range(1,d+1):
      d_factorial = d_factorial*x
    for x in range(1,r+1):
      r_factorial = r_factorial*x
    permutation= n_factorial/d_factorial
    print(permutation/r_factorial)
```

```
 Enter the value of n: 7
 Enter the value of n: 7
 1.0
```

15:Write a program (WAP) that will find x^y (x to the power y) where x, y are positive integers.

```
X = int(input("Enter the value of X: "))
Y = int(input("Enter the value of Y: "))
total = 1

for i in range(Y):
  total = total*X
print(total)
```

```
 Enter the value of X: 5
 Enter the value of Y: 2
 25
```

16:WAP that will find the GCD (greatest common divisor) and LCM (least common multiple) of two positive integers.

G.C.D (greatest common divisor)

```
a = int(input())
b = int(input())
GCD_a = []
GCD_b = []
GCD = []
for i in range(1,a+1):
  if a%i == 0:
    GCD_a.append(i)
for i in range(1,b+1):
  if b%i == 0:
    GCD_b.append(i)
print(GCD_a)
print(GCD_b)
for i in GCD_a:
  for j in GCD_b:
    if  i == j:
      GCD.append(j)
print(max(GCD))
```

```
 24
 30
 [1, 2, 3, 4, 6, 8, 12, 24]
 [1, 2, 3, 5, 6, 10, 15, 30]
 6
```

```
a = int(input())
b = int(input())
a1 = a
b1 = b
LCM_a = []
LCM_b = []
LCM = []
for i in range(1,11):
  a1+=a
  LCM_a.append(a1)
for i in range(1,11):
    b1+=b
    LCM_b.append(b1)
print(LCM_a)
print(LCM_b)
for i in LCM_a:
  for j in LCM_b:
    if  i == j:
      LCM.append(j)
print(min(LCM))
```

```
4
5
[8, 12, 16, 20, 24, 28, 32, 36, 40, 44]
[10, 15, 20, 25, 30, 35, 40, 45, 50, 55]
20
```

17:WAP that will determine whether a number is prime or not.

```
X = int(input("Enter the value of X: "))
valid = False

if X==1:
  print('not prime')

for i in range(2,X):
  if X%i == 0:
    valid = True
if valid:
  print('not Prime')
else:
  print('prime')
```

```
Enter the value of X: 2
prime
```

```
number = int(input('Enter any number: '))             # number = 6
f = 0                                                 # f = 0
if number == 1 or number ==0:                         # False because number is not equal to 1 or 0
  f = 1                                               # not happening
for i in range(2,number):                             # if the any divisor before the number return a 0 remainder it is not a prime
  if number%i == 0:
    f=1
if f==1:
  print('Number is not prime')
else:
  print('number is prime')
```

```
Enter any number: 2
number is prime
```

18: WAP that will determine whether an integer is palindrome number or not.

palindrome number is a number that reads the same forward and backward. In other words, if you reverse the digits of a palindrome number, you get the same number. For example, 121 is a palindrome number because if you read it backward, it is still 121.

```
number = input('Enter any integer number: ')
total = '0'
b=list(number)
print(b)
b.reverse()
print(b)
for i in b:
  total = total + i
if int(total) == int(number):
  print('yes')
else:
  print('No')
```

```
Enter any integer number: 91
['9', '1']
['1', '9']
No
```

```
# Input an integer from the user
number = int(input("Enter an integer: "))

# Convert the integer to a string for easier comparison
num_str = str(number)

# Check if the string is equal to its reverse
if num_str == num_str[::-1]:
    print(number, "is a palindrome number.")
else:
    print(number, "is not a palindrome number.")
```

19:

WAP that will calculate following mathematical function for the input of x. Use only the series to solve the problem.

$$Sinx = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots \ldots \ldots \infty$$

Sample input	*Sample output*
1	0.841
2	0.909
3	0.141

```
X = int(input("Enter the number of term: "))
N = int(input("Enter the number of term: "))
fact = 1

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

  fact = i*fact
print(fact)
```

```
# Input the value of x and the number of terms from the user
x = float(input("Enter the value of x: "))
terms = int(input("Enter the number of terms: "))

result = 0
sign = 1
factorial = 1

# Calculate the result for the given mathematical function
for i in range(terms):
    # Calculate factorial
    for j in range(1, 2 * i + 2):
        factorial *= j

    # Calculate term and update result
    term = sign * (x ** (2 * i + 1)) / factorial
    result += term

    # Alternate the sign for each term
    sign *= -1
    factorial = 1  # Reset factorial for next iteration

# Print the result
print("Result for x =", x, "with", terms, "terms:", result)
```

```
Enter the value of x: 1
Enter the number of terms: 2
Result for x = 1.0 with 2 terms: 0.8333333333333334
```

```
x = int(input("Enter the value of x: "))     # x = 1


result = 0       # result = 0
sign = 1         # sign = 1
factorial = 1    # factorial = 1


for i in range(x+1):           # for i in range(2):                    # 0 1
    # Calculate factorial
    for j in range(1, 2 * i + 2):      #    for j in range(1,2*1+2):  for j in range(1,4)
        factorial *= j                 #  factorial = 1*1*2*3

    # Calculate term and update result
    term = sign * (x ** (2 * i + 1)) / factorial        #   term = sign*(x**(2*i+1))/factorial   = -1*(1**(2*1+1))/3!
    result += term                    # result = 0 + term

    # Alternate the sign for each term
    sign *= -1                              # sign = sign*-1  =-1
    factorial = 1  # Reset factorial for next iteration

# Print the result
print("Result for x =", x, "with", terms, "terms:", result)
```

```
Enter the value of x: 3
Result for x = 3 with 2 terms: 0.09107142857142847
```

20:Write a program that takes an integer number n as input and find out the sum of the

following series up to n terms.

1 + 12 + 123 + 1234 + …….

```
n = int(input())
total = 0
j = '0'
for i in range(1,n+1):
  j = j + str(i)
#print(j)

a = int(j)

for i in range(n):
```