**1.ODD OR EVEN:**

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

if n%2==0:

print(n, "is an even number.")

else:

print(n, "is an odd number.")

**OUTPUT:**

Enter the number:15

15 is an odd number.

Enter the number:12

12 is an even number.

**2.POSITIVE OR NEGATIVE:**

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

if n<0:

print(n, "is a negative number.")

elif n>0:

print(n, "is a positive number.")

else:

print("0 is neither positive nor negative.")

**OUTPUT:**

Enter the number:12

12 is a positive number.

Enter the number:-21

-21 is a negative number.

Enter the number:0

0 is neither positive nor negative.

**3.Smallest of three numbers:**

a=int(input("Enter the first number:"))

b=int(input("Enter the second number:"))

c=int(input("Enter the third number:"))

if a<b and a<c:

print(a, "is the smallest number.")

elif b<a and b<c:

print(b, "is the smallest number.")

else:

print(c, "is the smallest number.")

**OUTPUT:**

Enter the first number:12

Enter the second number:23

Enter the third number:5

5 is the smallest number.

**4.GRADE:**

m=int(input("Enter the mark:"))

if m>90 and m<=100:

print("You have got A.")

elif m>80 and m<90:

print("You have got B.")

elif m>70 and m<80:

print("You have got C.")

else:

print("You have got D.")

**OUTPUT:**

Enter the mark:78

You have got C.

Enter the mark:89

You have got B.

Enter the mark:100

You have got A.

Enter the mark:50

You have got D.

**5.Fibonacci series:**

n=int(input("Enter the nth term:"))

f=0

s=1

print(f, end=" ")

print(s, end=" ")

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

t=f+s

print(t, end=" ")

f,s=s,t

**OUTPUT:**

Enter the nth term:4

0 1 1 2 3 5

**6.SUM OF n NATURAL NUMBERS:**

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

s=0

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

s+=i

print("The sum of", n, "is", s)

**OUTPUT:**

Enter the number of terms:10

The sum of 10 is 55

**7.i)Sum of series:**

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

n=int(input("Enter the value of n(for x\*\*n):"))

s=0

for i in range(n+1):

s+=x\*\*i

print("Sum of first", n, "terms is", s)

**OUTPUT:**

Enter the value of x:2

Enter the value of n(for x\*\*n):10

Sum of first 10 terms is 2047.0

**ii)Difference of series:**

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

n=int(input("Enter the value of n(for x\*\*n):"))

s=0

for i in range(n+1):

s-=x\*\*i

print("Difference of first", n, "terms is", s)

**OUTPUT:**

Enter the value of x:2

Enter the value of n(for x\*\*n):10

Difference of first 10 terms is -2047.0

**8.Number pattern:**

print("Enter 0 for general number pattern.")

print("Enter 1 for odd number pattern.")

print("Enter 2 for even number pattern.")

a=int(input("Enter the number pattern you desire:"))

if a==0:

n=int(input("Enter the nth term:"))

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

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

print(j, end=" ")

print()

elif a==1:

n=int(input("Enter the nth term:"))

for i in range(1,n+1,2):

for j in range(1,i+1,2):

print(j, end=" ")

print()

else:

n=int(input("Enter the nth term:"))

for i in range(2,n+1,2):

for j in range(2,i+1,2):

print(j, end=" ")

print()

**OUTPUT:**

Enter 0 for general number pattern.

Enter 1 for odd number pattern.

Enter 2 for even number pattern.

Enter the number pattern you desire:0

Enter the nth term:5

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

Enter 0 for general number pattern.

Enter 1 for odd number pattern.

Enter 2 for even number pattern.

Enter the number pattern you desire:1

Enter the nth term:7

1

1 3

1 3 5

1 3 5 7

Enter 0 for general number pattern.

Enter 1 for odd number pattern.

Enter 2 for even number pattern.

Enter the number pattern you desire:2

Enter the nth term:10

2

2 4

2 4 6

2 4 6 8

2 4 6 8 10

**9.Diamond pattern:**

rows = int(input("Enter the limit:"))

k = 0

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

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

print(end = " ")

while k != (2 \* i - 1):

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

k = k + 1

k = 0

print()

k = 2

m = 1

for i in range(1, rows):

for j in range (1, k):

print(end = " ")

k = k + 1

while m <= (2 \* (rows - i) - 1):

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

m = m + 1

m = 1

print()

**OUTPUT:**

Enter the limit:5

\*

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\*

**10.String pattern:**

**i)General:**

n=input("Enter the string:")

l=len(n)

for i in range(l):

for j in range(i+1):

print(n[j], end=" ")

print()

**OUTPUT:**

Enter the string:COMPUTER

C

C O

C O M

C O M P

C O M P U

C O M P U T

C O M P U T E

C O M P U T E R

**ii)Reverse:**

n=input("Enter the string:")

l=len(n)

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

for j in range(i):

print(n[j], end=" ")

print()

**OUTPUT:**

Enter the string:COMPUTER

C O M P U T E R

C O M P U T E

C O M P U T

C O M P U

C O M P

C O M

C O

C

**11.Factorial of a number:**

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

f=1

if n < 0:

print("Sorry, factorial does not exist for negative numbers")

elif n == 0:

print("The factorial of 0 is 1")

else:

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

f = f\*i

print("The factorial of",n,"is",f)

**OUTPUT:**

Enter the number:15

The factorial of 15 is 1307674368000

Enter the number:0

The factorial of 0 is 1

Enter the number:-4

Sorry, factorial does not exist for negative numbers

**12.GCD and LCM:**

a=int(input("Enter the first number:"))

b=int(input("Enter the second number:"))

if a>b:

s=b

else:

s=a

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

if a%i==0 and b%i==0:

hcf=i

lcm=(a\*b)/hcf

print("The H.C.F. of", a, "and", b, "is", hcf)

print("The L.C.M. of", a, "and", b, "is", lcm)

**OUTPUT:**

Enter the first number:25

Enter the second number:4

The H.C.F. of 25 and 4 is 1

The L.C.M. of 25 and 4 is 100.0

**13.Armstrong number:**

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

s=0

a=n

while a>0:

d=a%10

s=s+d\*\*3

a//=10

if n==s:

print(n, "is a armstrong number.")

else:

print(n, "is not a armstrong number.")

**OUTPUT:**

Enter the number:371

371 is aarmstrong number.

Enter the number:14

14 is not aarmstrong number.

**14.Test for prime numbers:**

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

if n>1:

for i in range(2,n):

if n%i== 0:

print(n,"is not a prime number")

print(i,"times",n//i,"is",n)

break

else:

print(n,"is a prime number")

else:

print(n,"is not a prime number")

**OUTPUT:**

Enter the number: 12

12 is not a prime number

2 times 6 is 12

Enter the number: 17

17 is a prime number

**15.Smallest,largest and third largest number in list:**

n=eval(input("Enter the numbers:"))

l=len(n)

n.sort()

print(n[0], "is the smallest number.")

print(n[l-1], "is the largest number.")

print(n[l-3], "is the third largest number.")

**OUTPUT:**

Enter the numbers:[3,5,54,7,89,2]

2 is the smallest number.

89 is the largest number.

7 is the third largest number.

**16.Palindrome:**

string=input(("Enter a string:"))

if(string==string[::-1]):

print(string, "is a palindrome string.")

else:

print(string, "is not a palindrome string.")

**OUTPUT:**

Enter a string:nursesrun

nursesrun is a palindrom string.

Enter a string:abc

abc is not a palindrom string.

**17.Insertion sorting:**

n=eval(input("Enter the numbers:"))

a=list(n)

l=len(a)

for i in range(l):

k=a[i]

j=i-1

while j>=0 and k<a[j]:

a[j+1]=a[j]

j=j-1

else:

a[j+1]=k

print("The list after sorting is", a)

**OUTPUT:**

Enter the numbers:12,3,45,64,20,2,5

The list after sorting is [2, 3, 5, 12, 20, 45, 64]

**18.Bubble sorting:**

n=eval(input("Enter the numbers:"))

a=list(n)

l=len(a)

for i in range(l):

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

if a[j]>a[j+1]:

a[j],a[j+1]=a[j+1],a[j]

print("The list after sorting is", a)

**OUTPUT:**

Enter the numbers:12,3,45,64,20,2

The list after sorting is [2, 3, 12, 20, 45, 64]

**19.To count the number of odd and even numbers in the list:**

n=eval(input("Enter the numbers:"))

l=list(a)

n\_e=0

n\_o=0

for n in l:

if n % 2 == 0:

n\_e += 1

else:

n\_o += 1

print("Even numbers in the list: ", n\_e)

print("Odd numbers in the list: ", n\_o)

**OUTPUT:**

Enter the numbers:12,3,45,64,20,2,5

Even numbers in the list: 4

Odd numbers in the list: 3