

Python



LOOP

for loop

Syntax:

```
for <variable> in <sequence>:  
    <block of codes>
```

```
for each item in a set (or in a sequence, or in a collection):  
    do something with the item
```

Example

Ex-1

```
str = '123456789'
```

```
sum = 0
```

```
for ch in str:
```

```
    sum += int(ch)
```

```
print(sum)
```



**GUESS THE OUTPUT
???**

Ex-2

```
words = [ 'got ' , 'me' , ' looking ' , 'so ' , 'crazy ' , ' right ' , 'now' ]
```

```
for w in words:
```

```
    print (w)
```

Ex-3

phrase = 'Silicon Institute Of Technology, Bhubaneswar'

for w in phrase:

print (w)



GUESS THE OUTPUT
???

Ex-4

Program to find the sum of all numbers stored in a list

numbers = [6, 5, 3, 8, 4, 2, 5, 4, 11]

sum = 0

for val in numbers:

sum = sum + val

print("The sum is", sum)



GUESS THE OUTPUT
???

Iterating Over tuples and lists

for i in [1, 2, 3]:

print(2 * i, ',')

for word in ['Hello!', 'Ciao!', 'Hi!']:

print(word.upper(), ',')



GUESS THE OUTPUT
???

range()

- Since we often want to range a variable over some numbers, we can use the **range()** function which gives us a list of numbers from 0 up to but not including the number we pass to it.
- range(5) returns [0,1,2,3,4] So we could say:

```
print(list(range(10)))  
list(range(42,-12,-7))  
[42, 35, 28, 21, 14, 7, 0, -7]  
start, end, step = 13, 2, -3  
print(list(range(start, end, step)))  
for x in range(5):  
    print x  
for x in range(3, 6):  
    print(x)           # Prints out 3, 4, 5  
for x in range(3, 8, 2):  
    print(x)
```

while loop

While loop repeats as long as certain boolean condition is met

Ex. 1 :

```
count = 0
while count < 5:
    print(count)
    count+=1
```



GUESS THE OUTPUT
???

Ex. 2 :

```
n = 10
i = 1
sum = 0
while i <= n:
    sum = sum + i
    i = i + 1          # update counter
print("The sum is", sum)
```



GUESS THE OUTPUT
???

break and continue

- **break** is used to exit a for loop or a while loop
- **continue** is used to skip current block, and return to "for" or "while" statement.

Ex-1

```
count = 0
while True:
    print(count)
    count += 1
    if count >= 5:
        break
```



**GUESS THE OUTPUT
???**

Ex-2

```
for x in range(10):
    if x % 2 == 0:
        continue
    print(x)
```

Check if x is even

for loop with else

The else part is executed if the items in the sequence used in for loop exhausts. break statement can be used to stop a for loop. In such case, the else part is ignored. Hence, a for loop's else part runs if no break occurs.

Ex :

```
digits = [0, 1, 5]
```

```
for i in digits:
```

```
    print(i)
```

```
else:
```

```
    print("No items left.")
```

Sample Program

Problem: WAP to find the sum of digits of a number.

Solution:

```
#Sum of digits of a number
```

```
num = int(input("Enter the value"))
```

```
sum = 0
```

```
while num!= 0:
```

```
    digit = num % 10
```

```
    sum = sum + digit
```

```
    num = num // 10
```

```
print("Sum of digits of a number is ",sum)
```

Sample Program

Problem: WAP to reverse a number.

Solution:

#Reverse of a number

```
num = int(input("Enter the value"))
```

```
rev = 0
```

```
temp = num
```

```
while num != 0:
```

```
    digit = num % 10
```

```
    rev = rev*10 + digit
```

```
    num = num // 10
```

```
print("Reverse of number ",temp," is ",rev)
```

Sample Program

Problem: WAP to check a number is palindrome or not?

Solution:

#WAP to check a number is Palindrome or not

```
num = int(input("Enter the value"))
```

```
rev = 0
```

```
temp = num
```

```
while num != 0:
```

```
    digit = num % 10
```

```
    rev = rev*10 + digit
```

```
    num = num // 10
```

```
print("Reverse of number ",temp," is ",rev)
```

```
if(rev == temp):
```

```
    print("Number ",temp," is palindrome")
```

```
else:
```

```
    print("Number ",temp," is not palindrome")
```

Sample Program

Problem: WAP to find factorial of a number.

Solution:

#Find the factorial of a number

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

```
factorial = 1
```

```
if num < 0:
```

```
    print("Sorry, factorial does not exist for
```

```
negative numbers")
```

```
elif num == 0:
```

```
    print("The factorial of 0 is 1")
```

```
else:
```

```
    for i in range(1,num + 1):
```

```
        factorial = factorial*i
```

```
    print("The factorial of",num,"is",factorial)
```

Sample Program

Problem: Find a number is Armstrong or not?

Solution:

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

```
sum = 0
```

```
temp = num
```

```
while temp > 0:
```

```
    digit = temp % 10
```

```
    sum += digit ** 3
```

```
    temp /= 10
```

```
if num == sum:
```

```
    print(num,"is an Armstrong number")
```

```
else:
```

```
    print(num,"is not an Armstrong number")
```

Sample Program

- **Problem:** WAP to find GCD and LCM of two numbers.

- **Solution:**

#WAP to find GCD and LCM of two numbers

```
num1 = int(input("Enter first number"))
```

```
num2 = int(input("Enter second number"))
```

```
temp1 = num1
```

```
temp2 = num2
```

```
while temp1 != temp2 :
```

```
    if temp1 > temp2:
```

```
        temp1 = temp1 - temp2
```

```
    else:
```

```
        temp2 = temp2 - temp1
```

```
print("GCD = ",temp1)
```

```
lcm = (num1 * num2)//temp1
```

```
print("\nLCM= ",lcm)
```

Sample Program

- **Problem:** WAP to find sum of the natural numbers.

- **Solution:**

```
#Sum of natural numbers
```

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

```
if num < 0:
```

```
    print("Enter a positive number")
```

```
else:
```

```
    sum = 0
```

```
# use while loop to iterate untill zero
```

```
while(num > 0):
```

```
    sum += num
```

```
    num -= 1
```

```
print("The sum is",sum)
```


Sample Program

- **Problem:** WAP to print the Fibonacci series up to given term.

- **Solution:**

```
#WAP to print the fibonacci series up to nth term
```

```
nterms = int(input("How many terms you want? "))
```

```
# first two terms
```

```
n1 = 0
```

```
n2 = 1
```

```
count = 2
```

```
# check if the number of terms is valid or not?
```

```
if nterms <= 0:
```

```
    print("Plese enter a positive integer")
```

```
elif nterms == 1:
```

```
    print("Fibonacci sequence:")
```

```
    print(n1)
```

```
else:
```

```
    print("Fibonacci sequence:")
```

```
    print(n1,",",n2,end=', ')
```

```
    while count < nterms:
```

```
        nth = n1 + n2
```

```
        print(nth,end=', ')
```

```
        # update values
```

```
        n1 = n2
```

```
        n2 = nth
```

```
        count += 1
```

Sample Program

- **Problem:** WAP to print the multiplication table of a given number.
- **Solution:**

```
#WAP to generate the multiplication table  
of any number
```

```
num = int(input("Show the multiplication  
table of? "))
```

```
# using for loop to iterate multiplication 10  
times
```

```
for i in range(1,11):  
    print(num,'x',i,'=',num*i)
```

Sample Program

- **Problem:** WAP to check a number is prime or not?

- **Solution:**

```
#WAP to check a number is prime or not
```

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

```
count=0;
```

```
if num > 1:
```

```
    for i in range(2,num):
```

```
        if (num % i) == 0:
```

```
            count = count+1;
```

```
if count == 0:
```

```
    print(num,"is a prime number")
```

```
else:
```

```
    print(num,"is not a prime number")
```

Contact Me

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