

Sub = Python

for i in sub :

 print(i).

Code repeatedly until a certain condition is met.
Python mainly provides 2 loops:-

Loops

- ① Loops in Python are used to execute a block of code repeatedly until a certain condition is met.
- ② Python mainly provides 2 loops:-

* For loop inside for loop.

- * While loop inside while loop.
- * While loop inside for loop.

- * For loop inside while loop.

Iteration :- one after another, iteration is possible in

for loop:

for loop.

② For loop with sequence:

Syntax:- For Variables in Sequence:

statements.

③ For loop with range() function

for Variable in range():

Statement

Inmutable String = Characters.

Mutable List = ordered Items.

Unmutable Tuple = Fixed Items.

unorderedCollection = unique item. {1, 2, 3} → Order may change.

dict = key - value pairs.

 ↳ {a: 1, b: 2} (b/p) a → 1, b → 2.

i = Iterative Variable.

for i in sub :

 print(i).

↓ tabulation shows relationship b/w present and past activities

of i:-

$\begin{cases} p = 0 \\ h = 5 \end{cases}$

Sub = "python"

↓

y = 1

b = 2

h = 3

↓

o = 4

↓

n = 5

↓

print(i)

↓ enumerate is the function which provides both character and also position.

(Q/P):-

(0, 'p')

(1, 'y')

(2, 't')

(3, 'h')

(4, 'o')

(5, 'n')

3. Standard words:-

→ In python there are 3 types of standard words.

1) Initialization, Allocation and deallocation of memory.

2) Condition.

3) Incrementation / Decrementation.

Range C Start Value, Stop Value, Step Size.

Default Start Value = 0

Default step size = 1

Range (1, 11, 1) // i = 1, 2, 3, 4, 5, 6, 7, 8, 9

5. Write a program to calculate the sum of 1 to 10 numbers.

```
S = 0 // value
for i in range(1, 11, 1) // S = 0 + 1 = 1
    S = 1 + 2 = 3
    S = 3 + 3 = 6
    S = 6 + 4 = 10
    S = 10 + 5 = 15
print(S)
o/p: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55
```

6. write a program to count how many even numbers from 1 to 15

```
Count = 0 // Sample o/p = 7
for i in range(1, 16, 1):
    if (i % 2 == 0): // when if condition true then only
        print("i=", i) // it enters else block
    else: // it comes out from the loop
        print("Count=", Count)
        Count = Count + 1 // increment
o/p: 0 p
```

7. program for step size decreasing:-

```
sub = "python"
for i in range(5, -1, -1): // end value is decrement & step size.
    print(i, sub[i])
```

8. program for gives no: is prime or not :-

```
num = int(input())
Count = 0
print("bc:", Count)
Count = 0
for i in range(2, num, 1):
    if (num % i == 0):
        Count = Count + 1
    else:
        Count = Count
print("ac:", Count)
if (Count == 1):
    print("number is prime")
else:
    print("number is not prime")
```

9. program for step size increasing:-

```
Count = 1 // step size = 1
i = 4
Count = 2
i = 6
Count = 3
i = 8
Count = 4
i = 10
Count = 5
i = 12
Count = 6
i = 14
Count = 7
o/p: bc=0, ac=1, number is prime
```

- ① A number that is divisible by 1 and itself is called prime
 ② Divisor of 9 are : 1, 3, 9

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• If it is prime or not:-
 need to subtract from the number that is divisible by more than just 1 and 9.

1) num = int(input())
 Count = 0 already 1 is divisible, so need to subtract from the number that is divisible by more than just 1 and 9.

print("bc", count) bc = 0
 for i in range(2, num+1):
 if (num % i == 0):

if (num % i == 0):
 Count = Count + 1
 else:

Count = Count
 print("ac =", Count)

if (Count == 0):
 print("it's prime")

else:
 print("not prime")

o/p: num = 10
 ac = 0
 bc = 0
 1 is prime number.

o/p ⇒ num = 10
 ac = 0
 bc = 0
 ⇒ [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

2) Prime or not by using Break:-
 num = 9
 for i in range(2, num, 1):
 if (num % i == 0):
 print("num is not prime")
 break
 else:

print("num is prime")
 o/p ⇒ # 9 ÷ 3 = 3 if 3 is divisible but quotient is 3
 9 is not prime number.

- ③ 9 is divisible by more than just 1 and 9.
 ④ So 9 is also a divisor, 9 breaks the prime rule.

- ⑤ So 9 is a composite number (a number that has factors other than 1 and itself).

π. Continue:-

num = int(input())
 if (i == 5): // only skip 5th iteration remain executes

continue
 else:

print(i)

o/p ⇒ num = 10
 ⇒ [1, 2, 3, 4, 6, 7, 8, 9, 10]

3) Loop statements

- Break ⇒ Exits loop immediately.
- Continue ⇒ Skips the current iteration and goes to the next.
- Pass. ⇒ Does nothing (placeholder statement)

∴ Prime or not by using Break:-

num = 9
 for i in range(2, num, 1):
 if (num % i == 0):
 print("num is not prime")
 break
 else:

print("num is prime")
 o/p ⇒ # 9 ÷ 3 = 3 if 3 is divisible but quotient is 3
 9 is not prime number.

while loop syntax:-

1. Initialization.

2. Condition \rightarrow while

3. Statement

4. Increment / decrement (+1 or -1)

1) write a program for while:-

```
name = "SRI"
i = 0
while (i < len(name)):
    print(i)
```

2) write a program for printing 1st 10 fibonacci series value.

Fibonacci series:-

It is a sequence of numbers, where each number

is the sum of the previous two numbers.

starting from 0 and 1 (initial values)

$$0 \xrightarrow{+1} 1 \xrightarrow{+1} 2 \xrightarrow{+1} 3 \xrightarrow{+1} 5 \xrightarrow{+1} 8 \xrightarrow{+1} 13 \xrightarrow{+1} 21 \xrightarrow{+1} 34$$

3) write a program to calculate sum of the digits without

using any built-in functions:- (ex) 3582.

$num = int(input())$

$S = 0$ // sum = 0. num = 3582, S=0

while (num > 0): # iteration \Rightarrow digit(3582%10=2) \rightarrow True.

 digit = (num % 10) // 10 # digit = 2, digit = 2, sum = 2

 S = S + digit. (3582//10 = 358) num = 358

 print(S) # iteration \Rightarrow (358>2) True. digit = 8, S = 2 + 8 = 10

To calculate this we use swap logic.

program:-

$a = 0$

$b = 1$

$i = 1$

$while (i < 10):$

 print(a)

 S = a+b

 a = b+b

 b = S // we can write a,b = b,S

 2 = 1+1

 3 = 1+2

 5 = 1+3

 8 = 1+5

 13 = 1+8

 21 = 1+13

 34 = 1+21

(after swap)

Start value of num value (0)

a = 0, b = 1

0 + 1 (sum of previous) 0 + 1 = 1

1 + 1 (sum of previous) 1 + 1 = 2

2 + 3 (sum of previous) 2 + 3 = 5

3 + 5 (sum of previous) 3 + 5 = 8

5 + 8 (sum of previous) 5 + 8 = 13

8 + 13 (sum of previous) 8 + 13 = 21

13 + 21 (sum of previous) 13 + 21 = 34

O/P \Rightarrow

0 \Rightarrow initial
1 = initial
2 = 0+1