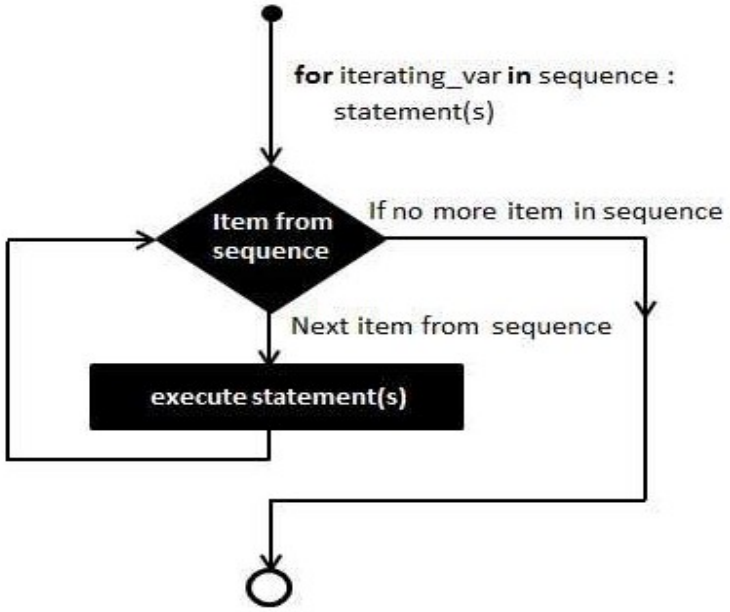
Chapter -4: Operators, Expressions and Python Statements

for Loop

- A **for** loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set, or a string).
- Syntax

```
for iterating_var in sequence:
    statements(s)
```

- **statement(s)** may be a single statement or a block of statements.
- Each item(starting from the first item) in the list is assigned to *iterating_var*, and the statement(s) block is executed until the entire sequence is exhausted.
- In Python, all the statements indented by the same number of character spaces after a programming construct are considered to be part of a single block of code. Python uses indentation as its method of grouping statements.



Example

```
# Program-1  to print 1 to 10

for x in range(1, 6, 1) :
    print(x)
```

When the above code is executed, it produces the following result –

```
1
2
3
4
5
```

```
# Program-2  to print 1 ,3,5,7,9

for x in range(1, 10, 2) :
    print(x)
```

When the above code is executed, it produces the following result −

```
1
3
5
7
9
```

```
# Program-3  to print sum of 1 to 10

sum = 0
for x in range(1, 11, 1) :
     sum=sum + x

print ('The sum is:', sum)
```

When the above code is executed, it produces the following result −

```
The sum is: 55
```

```
# Program-4 to factorial of number

count = 1
fact = 1
for x in range(1, 6, 1) :
          fact = fact * x

print ('The fact is:', fact)
```

When the above code is executed, it produces the following result −

```
The fact is: 120
```

Using else Statement with Loops

If the **else** statement is used with a **for** loop, the **else** statement is executed when the loop is finished.

```
for x in range(1, 6, 1) :
   print (x, " is  less than 5")
else:
   print (x, " is not less than 5")
```

When the above code is executed, it produces the following result −

0 is less than 5
1 is less than 5
2 is less than 5
3 is less than 5
4 is less than 5
5 is not less than 5

Range Function

- It is a in-built function.
- The range() function returns a sequence of numbers, starting from 0 by default, and increments by 1 (by default), and ends at a specified number.

Syntax

range (start, stop, step*)*

Parameter Values

Parameter	Description
start	Optional. An integer number specifying at which position to start. Default is 0
stop	Required. An integer number specifying at which position to end.
step	Optional. An integer number specifying the incrementation. Default is 1

Example

x = range(3, 6)	3, 4, 5
x = range(3, 20, 2)	3, 5, 7, 9, 11, 13, 15, 17, 19
x = range(10)	1, 2, 3, 4, 5, 6, 7, 8, 9
x = range(10, 1, -1)	10, 9, 8, 7, 6, 5, 4, 3, 2
x = range(-10, -1, 1)	-10, -9, -8, -7, -6, -5, -4, -3, -2
x = range(10, 1, -2)	10, 8, 6, 4, 2

Loop with the tuple items

```
fruits = ("apple", "banana", "cherry")
for x in fruits:
    print(x)
```

Output : apple , banana , cherry

Looping Through a String

```
for x in "banana":
    print(x)
```

Output : b , a, n , a , n, a

Looping Through a list

```
Months = ["Jan","Feb","Mar","April","May","June"]
for m in (Months):
    print (m)
```

Output : Jan , Feb, Mar , April, May, June

Looping with enumerator

```
Months = ["Jan","Feb","Mar","April","May","June"]
for i, m in enumerate (Months):
      print (i , m)
```

Output : 0 Jan , 1 Feb, 2 Mar , 3 April, 4 May, 5 June

The break Statement

With the **break** statement we can stop the loop before it has looped through all the items:

Example

```
#Exit the loop when x is "banana" :
fruits = ["apple", "banana", "cherry"]
for x in fruits :
    print(x)
    if x == "banana" :
        break
```

Output : apple , banana

The continue Statement

With the **continue** statement we can stop the current iteration of the loop, and continue with the next .

Example

```
#Do not print banana:
fruits = ["apple", "banana", "cherry"]
for x in fruits:
    if x == "banana":
        continue
    print(x)
```

Output : apple , cherry

Assignment (all the from using for loop)

1. Write the program to display the first 10 terms of the following series :
   a. 1 , 3, 5,……
   b. 2 , 4 , 6 ……
   c. 1 , 4 , 9 , 16…….
   d. 1.5 , 3.0 , 4.5 , 6.0 ……..
   e. -5 , -10 , -15, -20 …….
2. Write a program to calculate and display the sum of all odd numbers and even numbers between a range of numbers from m to n where m < n. Input m and n.
3. Write a program to print the 10 multiples of any entered number.
4. Write a program to display the sum of 10 natural numbers.
5. Write a program to calculate and display the factorial of a entered number.
6. Write a program to count the letter in entered string.
7. Write a program to count the vowels in entered string.