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## Loops

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Sometimes we want to repeat a set of statement in our program. For instance: print 1 to 100.

Loop makes it easy for a programmer to tell the computer, which set of instruction to repeat how!

### Types of Loop in python

primarily there are two types of loop in python.

- 1] While loop
- 2] for loop.

Code will look into one by one.

### While Loop

The syntax of a while loop looks like this.

While Condition :

# Body of the loop



"The block keep executing until the condition is true"

In while loop, the condition is checked first.

If it evaluate to true, the body of the loop is executed, otherwise not!

If the loop is entered, the process of [condition checked + execution] is continue until the condition become false. :-)

### Quick Quiz:

Write a program to print 1 to 100 using a while loop.

### An Example:

i = 0

while i < 5:

    point("Tejas")  
    i = i + 1 → points "Tejas" - 5 times!

### Note:

If a condition is never become false, the loop keeps getting executed.

## Quiz:

Create a program to print the content of a list using while loop.

## For Loop :-

The for loop is used to iterate through a sequence like list, tuple or string [iterable].

The syntax of a for loop looks like this:

```
l = [1, 7, 8]
for item in l:
    print(item)
```

↓ elements of  
→ point 1, 7, 8.

## Range in Python (Function)

The range function in python is used to generate a sequence of numbers. We can also specify the start, stop & step-size as follows.

`range (start, stop, step-size)`

"step size is usually not used with range ()"

## An Example demonstrating range() function

```
for i in range(0, 7)  
    print(i)
```

range(7) can also be used  
print 0 to 6

## for Loop with Else:

An optional else can be used with a for loop if the code is to be executed when the loop exhausts.

Example:-

```
l = [1, 7, 8]  
for item in l:  
    print(item)
```

else:

print("Done")

→ This is printed when the loop exhausts!

Output

1

7

8

Done.

## The Break statement

'Break' is used to come out of the loop when encountered it instructs the program to exit the loop now.

Example:

```
for i in range(0, 80):  
    point(i)
```

If  $i == 3$ :  $\rightarrow$  This will point 0, 1, 2  
break  $\quad \quad \quad$  & 3.

## The Continue statement:

'Continue' is used to stop the current iteration of the loop & continue with the next one it instructs the program to "skip the iterations"

Example:

```
for i in range(4):
```

point("pointing")

if  $i == 2$ :

continue  $\rightarrow$  If  $i$  is 2, the  
 point(1) iteration is skipped.

## pass Statement

pass is a null statement in Python  
It instructs to "Do Nothing"

Example:

$l = [1, 7, 8]$

for item in l:

    pass → Without pass, the  
        program will throw error

# Practice Set

1. Write a program to print multiplication table of a given number using for loop.
2. Write a program to greet all the person names stored in a list if which starts with s.
3. 

```
l1 = ["Tejas", "Siyal", "Himanshu", "Shruti"]
```
4. Attempt problem 1 using while loop.
5. Write a program to find the sum of n natural numbers using while loop.
6. Write a program to calculate the factorial of a given number using for loop.
7. Write a program to print the following star pattern.  
  
\*  
\* \* \*  
\* \* \* \* \* for n=3

8. Write a following star pattern:

+

++

\*\*\*

for  $n=3$

9. Write a program to print the following star pattern.

\*\*\*

\* \*

\* \* \*

for  $n=3$

10. Write a program to print multiplication-table of  $n$  using for loop in reversed order.