

# Chapter - 25 Loops in Python

## Lesson Objective :

- For loop
- Range() function
- While loop

**Skills to be attained :** Usage of if-else statement, developing logical thinking.

## Tools / Websites / Resources :

1. <https://www.onlinegdb.com/>
2. gedit text editor in Hitech lab

## Teacher Led Instruction :

### Loops in Python

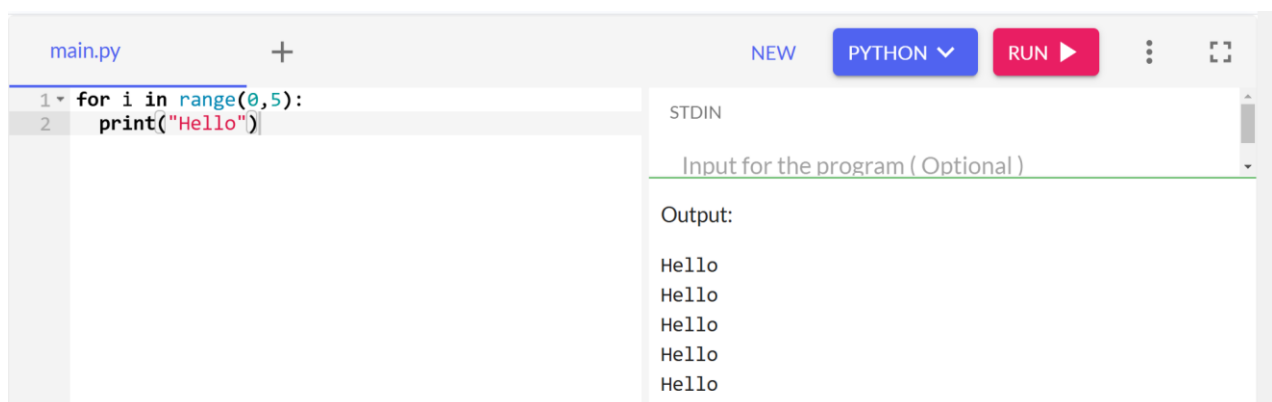
Loops help us repeat actions in Python without writing the same code multiple times.

Imagine you're writing a note to your friend and instead of writing "Hello!" five times, you just say, "Write 'Hello!' five times!" That's what a loop does in programming.

### Types of Loops

#### 1. For Loop

A **'for'** loop helps us repeat something for each item in a list or for a certain number of times. A python code to print the word 'Hello' five times using for loop.



The screenshot shows an online Python IDE interface. On the left, a code editor displays a Python script in a file named 'main.py':

```
1 for i in range(0,5):  
2     print("Hello")
```

On the right, there is a control panel with buttons for 'NEW', 'PYTHON' (with a dropdown arrow), and 'RUN' (with a play icon). Below these buttons is a section for 'STDIN' with a text input field labeled 'Input for the program ( Optional )'. The 'Output:' section shows the result of running the code:

```
Hello  
Hello  
Hello  
Hello  
Hello
```

## 2. While Loop

A while loop repeats something as long as a condition is True. A python code to print the word 'Hello' five times using while loop.



The screenshot shows a Python IDE interface. On the left, a file named 'main.py' contains the following code:

```
1 count=0
2 while(count<5):
3     print("Hello")
4     count+=1
```

On the right, the 'STDIN' panel is empty, and the 'Output' panel displays the result of running the code:

```
Output:
Hello
Hello
Hello
Hello
Hello
```

For loop does this task using range function. But while loop does the same task using condition.

## Range Function

The range() function gives us a sequence of numbers, which we can use to control how many times a loop runs.

### Example:



The screenshot shows a Python IDE interface. On the left, a file named 'main.py' contains the following code:

```
1 for i in range(1,6):
2     print(i)
```

On the right, the 'STDIN' panel is empty, and the 'Output' panel displays the result of running the code:

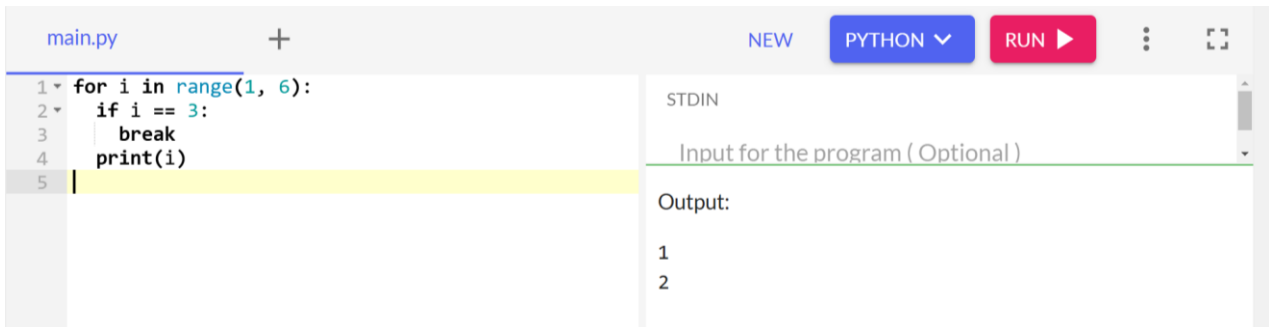
```
Output:
1
2
3
4
5
```

## Jump Statements

Sometimes we want to stop a loop early or skip something. That's where jump statements come in.

**Break :** break stops the loop.

**Example:**



The screenshot shows a Python IDE with a file named 'main.py'. The code in the editor is as follows:

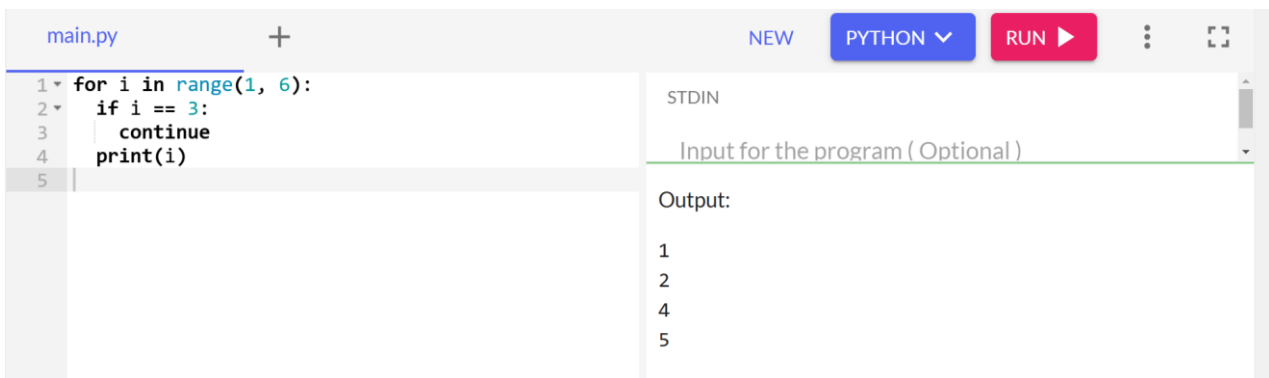
```
1 for i in range(1, 6):
2     if i == 3:
3         break
4     print(i)
5
```

The IDE interface includes a 'NEW' button, a 'PYTHON' dropdown menu, and a 'RUN' button. To the right of the code editor, there is a 'STDIN' input field labeled 'Input for the program ( Optional )' and an 'Output' section. The output section displays the numbers '1' and '2', indicating that the loop executed for i=1 and i=2 before being interrupted by the 'break' statement at i=3.

This will print 1 and 2, then stop when it reaches 3.

**Continue :** Continue skips one loop and moves on to the next.

**Example:**



The screenshot shows a Python IDE with a file named 'main.py'. The code in the editor is as follows:

```
1 for i in range(1, 6):
2     if i == 3:
3         continue
4     print(i)
5
```

The IDE interface is identical to the previous example, with 'NEW', 'PYTHON', and 'RUN' buttons. The 'Output' section displays the numbers '1', '2', '4', and '5'. This demonstrates that the 'continue' statement skips the iteration for i=3, allowing the loop to proceed to i=4 and i=5.

This will print 1, 2, 4, and 5 (it skips 3).

**Student Activity :**

**Activity 1 :** Write a code to print your name 10 times.

**Activity 2 :** Write a code to display numbers from 1 to 10 but skip the numbers 4 and 5.

## Conclusion

- Loops help automate repetitive tasks.
- The range() function simplifies iteration, while jump statements like break and continue control the flow of loops.