**LOOPS**

The looping simplifies the complex problems into the easy ones. It enables us to alter the flow of the program so that instead of writing the same code again and again, we can repeat the same code for a finite number of times. For example, if we need to print the first 10 natural numbers then, instead of using the print statement 10 times, we can print inside a loop which runs up to 10 iterations.

**Advantages of using Loops**

* It provides code re-usability.
* Using loops, we do not need to write the same code again and again.
* Using loops, we can traverse over the elements of data structures (array or linked lists).

**Python has two primitive loop commands:**

* while loops
* for loops

**While Loop**

The while loop is to be used in the scenario where we don't know the number of iterations in advance. The block of statements is executed in the while loop until the condition specified in the while loop is satisfied. It is also called a pre-tested loop.

Text

Description automatically generated**With the while loop we can execute a set of statements as long as a condition is true.**

**Note:- remember to increment i, or else the loop will continue forever.**

The while loop requires relevant variables to be ready, in this example we need to define an indexing variable, i, which we set to 1.

**Break Statement**

With the break statement we can stop the loop even if the while condition is true.

**Continue Statement**

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

**Else Statement**

With the else statement we can run a block of code once when the condition no longer is true.

Practical:- <https://github.com/kalyankalluri999/Python_Practice/blob/main/Loops.ipynb>

**Python For Loops**

A for loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set, or a string) (or) The for loop is used in the case where we need to execute some part of the code until the given condition is satisfied. The for loop is also called as a per-tested loop. It is better to use for loop if the number of iteration is known in advance.

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This is less like the for keyword in other programming languages, and works more like an iterator method as found in other object-orientated programming languages.

With the for loop we can execute a set of statements, once for each item in a list, tuple, set etc.

Note:- **The for loop does not require an indexing variable to set beforehand.**

**Looping Through a String**

Even strings are iterable objects, they contain a sequence of characters:

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**The break statement**

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

**The continue statement**

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

**The range() Function**

To loop through a set of code a specified number of times, we can use the range() 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.

Note that range(6) is not the values of 0 to 6, but the values 0 to 5.

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Description automatically generatedThe range() function defaults to 0 as a starting value, however it is possible to specify the starting value by adding a parameter: range(2, 6), which means values from 2 to 6 (but not including 6):

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Description automatically generatedThe range() function defaults to increment the sequence by 1, however it is possible to specify the increment value by adding a third parameter: range(2, 30, **3**):

**Else in For Loop**

The else keyword in a for loop specifies a block of code to be executed when the loop is finished.

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**Note:** The else block will NOT be executed if the loop is stopped by a break statement.

**Nested Loops**

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Description automatically generatedA nested loop is a loop inside a loop. |The "inner loop" will be executed one time for each iteration of the "outer loop”.

**The pass Statement**

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Description automatically generatedfor loops cannot be empty, but if you for some reason have a for loop with no content, put in the pass statement to avoid getting an error.

Practical:- <https://github.com/kalyankalluri999/Python_Practice/blob/main/Loops.ipynb>