

## Python iterative statements (Loops)

**Loops:** as all programming language, Python supports the usual Loops to fulfil the looping needs: **while** and **for** loops.

The while loop:				
<b>while</b> (condition): Statements		<b>while</b> (condition): Statements <b>else:</b> Statements		
<i>What does the following programs output?</i>				
counter = 0 <b>while</b> counter < 10: counter = counter + 1 print("Python Loops") print("iteration count ", Counter)	counter = 0 <b>while</b> counter != 10: counter = counter + 1 print(counter)	Nbr = int ( input( "Entre a negative number:" ) )  <b>while</b> nbr >= 0 :  nbr = int ( input ( " a negative number !?: " ) )  print ( " you have entered a negative number " )		
counter = 0 <b>while</b> counter < 10: print("Python Loops") counter = counter + 1 print("iteration count ", Counter)	counter = 0 <b>while</b> counter == 10: counter = counter + 1 <b>else:</b> print("Python Loops") print("iteration count ", Counter)	i = 1 <b>while</b> i < 6: print(i) if i == 3: <b>break</b> # exit from the loop i += 1		
The For loop:				
<b>General Syntax:</b>  <b>for</b> looping variable <b>in</b> sequence: code bloc	<b>for</b> variable <b>in</b> range(n, m, p) : statements		<b>for</b> variable <b>in</b> range(n, m, p) : statements <b>else :</b> statements	
	n: Start value m: end value p: step value			
<i>What does the following programs output?</i>				
<b>for</b> i <b>in</b> range(-1, 5, 2): print(i, end= ", ")	<b>for</b> i <b>in</b> range(1 , 10): print("Iteration", i)	<b>for</b> i <b>in</b> range(10): print("Iteration", i)	<b>for</b> i <b>in</b> range(10,1): print("Iteration", i) <b>else :</b> print("code else")	<b>for</b> c <b>in</b> "hello world": <b>print</b> (c)

**Writing scripts (use the both while and for in each script):**

- Write a program that displays the even numbers between 0 and 100
- Write a program that calculates the factorial of a user-entered integer without using the factorial built-in function
- Considering the Series defined by:  $S = 1 + 2 + 3 + \dots + n$ . Write a program that calculates S ( $n$  is a user-entered integer value).
- Same question in 14 with  $S = 1 + \frac{x}{1} + \frac{x^2}{2} + \frac{x^3}{3} + \dots + \frac{x^n}{n}$  (x is a user-entered real value)
- Calculate the Nth term  $U_N$  of the FIBONACCI sequence which is given by the recurrence relation:  $U_1=1, U_2=1, U_N = U_{N-1} + U_{N-2}$  (for  $N > 2$ ). N is a user-entered integer value.
- Create a simple calculator for additions! Repeatedly ask the user to enter numbers. Each time that the user provides input, this input is first converted to **float** and then added to a running total (which should start from 0). When the user enters 'add', the loop stops and the running total is printed out.