

Iteration/Looping

Second stage, computer science department, college of science for women, university of Baghdad.

Dr. Amer Al-Mahdawi

While Loop

- The Python while loop has the basic form:
- **while** <test-condition-is-true>:
 - statement or statements
- The following illustrates an example while loop in Python:
- `count = 0`
- `print('Starting')`
- **while** `count < 10:`
 - `print(count, ' ', end='')` # part of the while loop
 - `count += 1` # also part of the while loop
- `print()` # not part of the while loop
- `print('Done')`

The result of running this example is:
Starting
0 1 2 3 4 5 6 7 8 9
Done

For Loop

- The format of the Python for loop when using a range of values is
- **for** <variable-name> **in** range(...):
- statement
- statement
- An example is shown below which equates to the while loop we looked at
- earlier:
- # Loop over a set of values in a range
- print('Print out values in a range')
- **for** i **in** range(0, 10):
- print(i, ' ', end='')
- print()
- print('Done')

When we run this code, the output is:
Print out values in a range
0 1 2 3 4 5 6 7 8 9
Done

For Loop

- # Now use values in a range but increment by 2
- `print('Print out values in a range with an increment of 2')`
- `for i in range(0, 10, 2):`
- `print(i, ' ', end="")`
- `print()`
- `print('Done')`
- When we run this code, the output is
- Print out values in a range with an increment of 2
- 0 2 4 6 8
- Done

Break Loop Statement

- `print('Only print code if all iterations completed')`
- `num = int(input('Enter a number to check for: '))`
- `for i in range(0, 6):`
- `if i == num:`
- `break`
- `print(i, ' ', end='')`
- `print('Done')`
- If we run this and enter the value 7 (which is outside of the range) then all the values in the loop should be printed out:
- Enter a number to check for: 7
- 0 1 2 3 4 5 Done

Break Loop Statement

- However, if we enter the value 3 then only the values 0, 1 and 2 will be printed out before the loop breaks (terminates) early:
- Enter a number to check for: 3
- 0 1 2 Done

- **Continue Loop Statement**

- for i in range(0, 10):
- print(i, ' ', end="")
- if i % 2 == 1:
- continue
- print('hey its an even number')
- print('we love even numbers')
- print('Done')

When we run this code, we get

```
0 hey its an even number
we love even numbers
1 2 hey its an even number
we love even numbers
3 4 hey its an even number
we love even numbers
5 6 hey its an even number
we love even numbers
7 8 hey its an even number
we love even numbers
9 Done
```