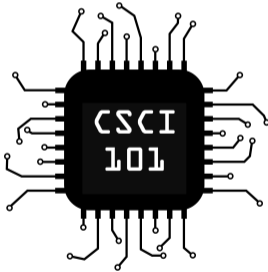


while Loops



Looping on a Condition

while is a loop that checks a condition before entry into an indented code block, and repeats **while** the condition is **True**.

```
i = 1
while i <= 10:
    print(i, "Hello, World!")
    i = i + 1
```

Comparing if and while

You can think of `while` like `if`: the only difference being that `if` executes its body once if the condition is `True`, whereas `while` will repeat its body while the condition is `True`.

```
i = 1
if i < 10:
    i = i + 1
# i is now 2
```

```
i = 1
while i < 10:
    i = i + 1
# i is now 10
```

Loop Control: continue

A `continue` statement allows you to **continue to the next iteration** of the loop.

```
i = 0
while i < 3:
    i = i + 1
    if i == 2:
        # skip to the top of the loop
        continue
    print("i is not 2, it is", i)
```

```
i is not 2, it is 1
i is not 2, it is 3
```

Loop Control: break

A **break** statement allows you to **stop loop iteration immediately**.

```
s = 0
while s < 100:
    i = int(input("Enter a number, or 0 to exit: "))
    if i == 0:
        # stop the loop
        break
    s = s + i
print("Okay, bye!")
```

```
Enter a number, or 0 to exit: 3
```

```
Enter a number, or 0 to exit: 0
```

```
Okay, bye!
```

Do While in Python

Python does not have a *do while* loop as its functionality can be replaced using a `while True` and `break`.

```
do (  
    Δ loop body  
) while condition.
```

```
while True:  
    # loop body  
    if not condition:  
        break
```

Practice: Trace the Loops

First, trace the loop by hand and determine the output. Then, type the loop into a Python script and run it to determine if you were correct.

Loop 1

```
x = 1
i = 2
while x < 10:
    x = x + i
    i = i * 2
    print(x, i)
print("Python!")
```

Practice: Trace the Loops

First, trace the loop by hand and determine the output. Then, type the loop into a Python script and run it to determine if you were correct.

Loop 2

```
i = 0
while i < 2:
    i = i + 1
    j = 0
    while j < 3:
        j = j + 1
        print(i, j)
print("Okay!")
```


Practice: Trace the Loops

First, trace the loop by hand and determine the output. Then, type the loop into a Python script and run it to determine if you were correct.

Loop 3

```
i = 0
while i < 20:
    if i % 3 == 0:
        print(i)
    i = i + 1
```