

# while Loops

C-START Python PD Workshop

# 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
```

## 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
```