




# Loops

 **Heads Up!** This content is intended to be used in a facilitated session with mentors. Feel free to browse the materials here, but be aware that if you choose to work through this material in advance, you will still be expected to start from scratch and follow along with the rest of the class.

## Loops

Learning Objectives:

- Understand how to use for and while loops.
- Understand what situations loops are useful in.

### Introduction

Give a brief (verbal) description of what loops are for. E.g. “Often we need to perform the same action multiple times, this is where loops come in handy.”

### For Loops

Provide some context for what a for loop is and what you would use it for, e.g. “We use a for loop when we know how many times the loop should run.”

Demonstrate:

- How to use a for loop to repeat code a given number of times.

Create a file: `for_loops_playground.py`

Walk through (and have the students follow along on their own computers) an example to demonstrate the ideas listed above, for example:

```
for num in range(10):  
    print(num)  
  
for num in range(1, 11):  
    print(num)  
  
for num in range(0, 11, 2):  
    print(num)
```

Set a small challenge similar to the example you walked through, some ideas:

- Use a for loop to print numbers 0 to 100 (inclusive).
- Use a for loop to print the numbers 0 to 100 in steps of 100 (5, 10, 15, etc..).

Demonstrate:

- How to use a for loop to repeat code for every item in a list.

Walk through (and have the students follow along on their own computers) an example to demonstrate the ideas listed above, for example:

```
chilli_wishlist = ['igloo', 'chicken', 'donut toy', 'cardboard box']

for item in range(len(chilli_wishlist)):
    print(chilli_wishlist[item])

for item in chilli_wishlist:
    print(item)
```

Set a small challenge similar to the example you walked through, some ideas:

- Adapt the for loop to print a message for each item in the list, e.g. "Chilli wants: item".
- Use a for loop to print each item in a list from a previous exercise or example.

Demonstrate:

- Nested for loops.

Walk through (and have the students follow along on their own computers) an example to demonstrate the ideas listed above, for example:

```
chilli_wishlist = [
    ["igloo"],
    ["donut toy", "tennis ball", "crocodile toy"],
    ["chicken", "peanut butter"],
    ["cardboard box", "kong", "dig mat"]
]

for category in chilli_wishlist:
    for item in category:
        print(item)
```

## While Loops

Provide some context for what a while loop is and what you would use it for, e.g. "We use a while loop when we want the loop to break based on a condition, rather than to run a set number of times".

Demonstrate:

- How to use a while loop to repeat code until a certain condition is met.

Walkthrough (and have the students follow along on their own computers) an example to demonstrate the ideas listed above, for example:

```
guess = ""
while guess != "a":
    guess = input("Guess a letter: ")
```

```
counter = 10
while counter < 10:
    print(counter)
    counter = counter - 1
```

Set a small challenge similar to the example you walked through, some ideas:

- Ask the user to continually enter names until a blank string is entered.