

Week 3: Complex Data Types

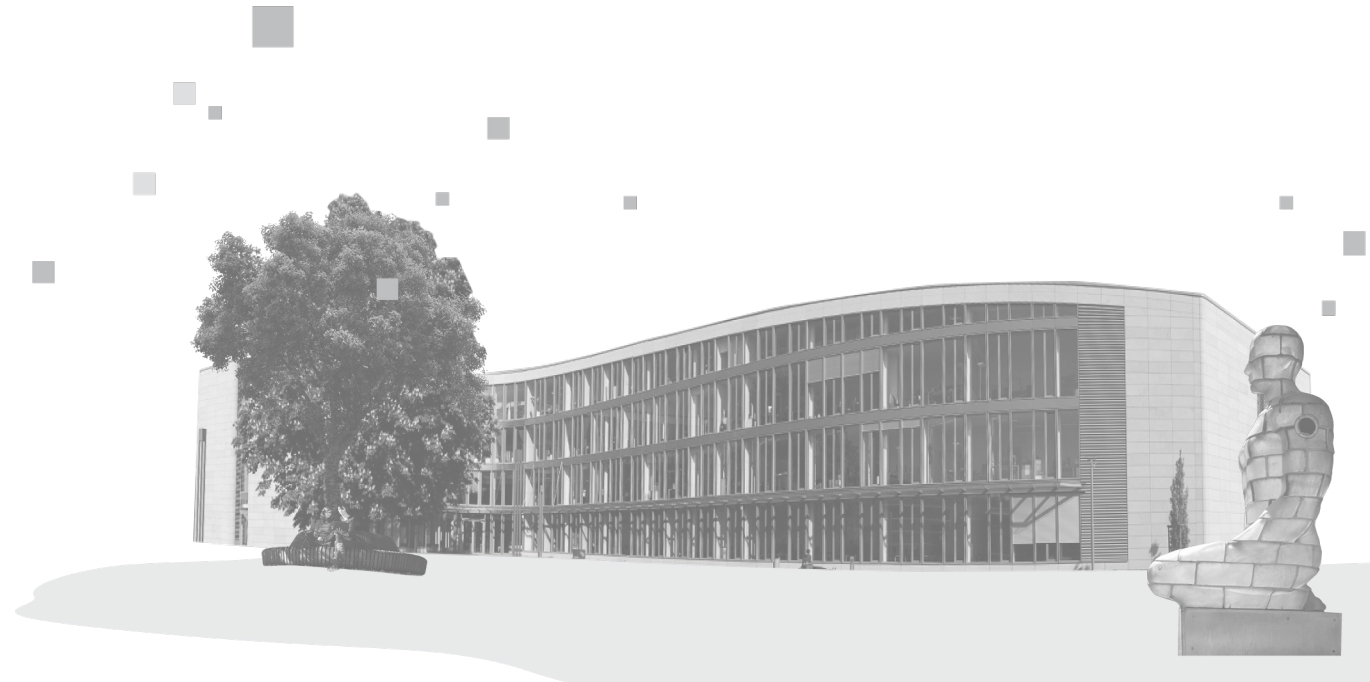
Unit 6: While Loop

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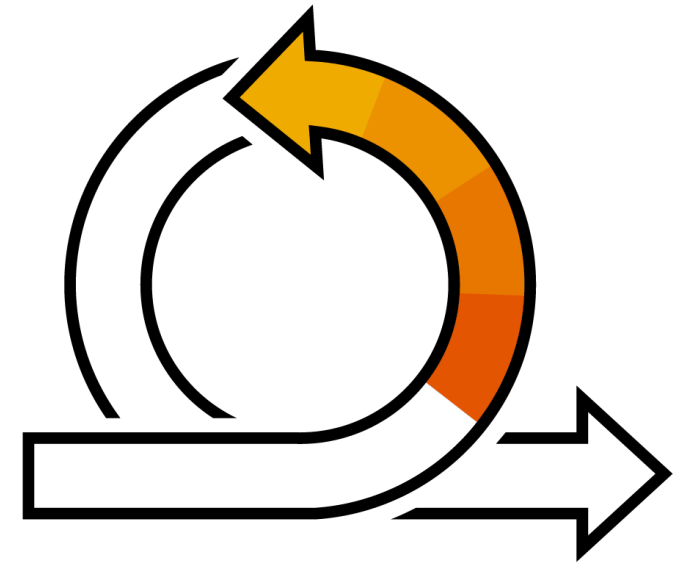
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While loop

Sometimes, the for loop does not fit ...

- The for loop is well suited to iterate over a sequence.
- Sometimes, you do not have a sequence. You do not even know how often you have to iterate the loop.
- Examples:
 - A PIN is entered until it is finally correct
 - An input is checked until it finally has the correct data type
 - Input data is taken until the user finishes the input with an empty return
- In these situations, a while loop fits better
 - A while loop does not iterate over a sequence but iterates until a given condition is False



While loop

Syntax of the while loop

- The while loop has the following syntax:
- The behavior of the while loop is as follows:
 - If the condition is `True` all statements are executed.
 - After that, the condition is checked again. If it is `True` the statements are executed again.
 - This continues until the condition is `False`
 - If the condition is `False` right from the beginning, the statements within the loop are not executed at all.
 - If the condition will never get `False`, you are in an endless loop.

```
while condition:  
    statement1  
    statement2  
    ...  
    statementN
```

```
# The loop runs until a suitable input is available  
number = input("Please enter number: ")  
while not (number.isdecimal()):  
    number = input("Please enter number: ")  
  
number = int(number)  
print(number)
```

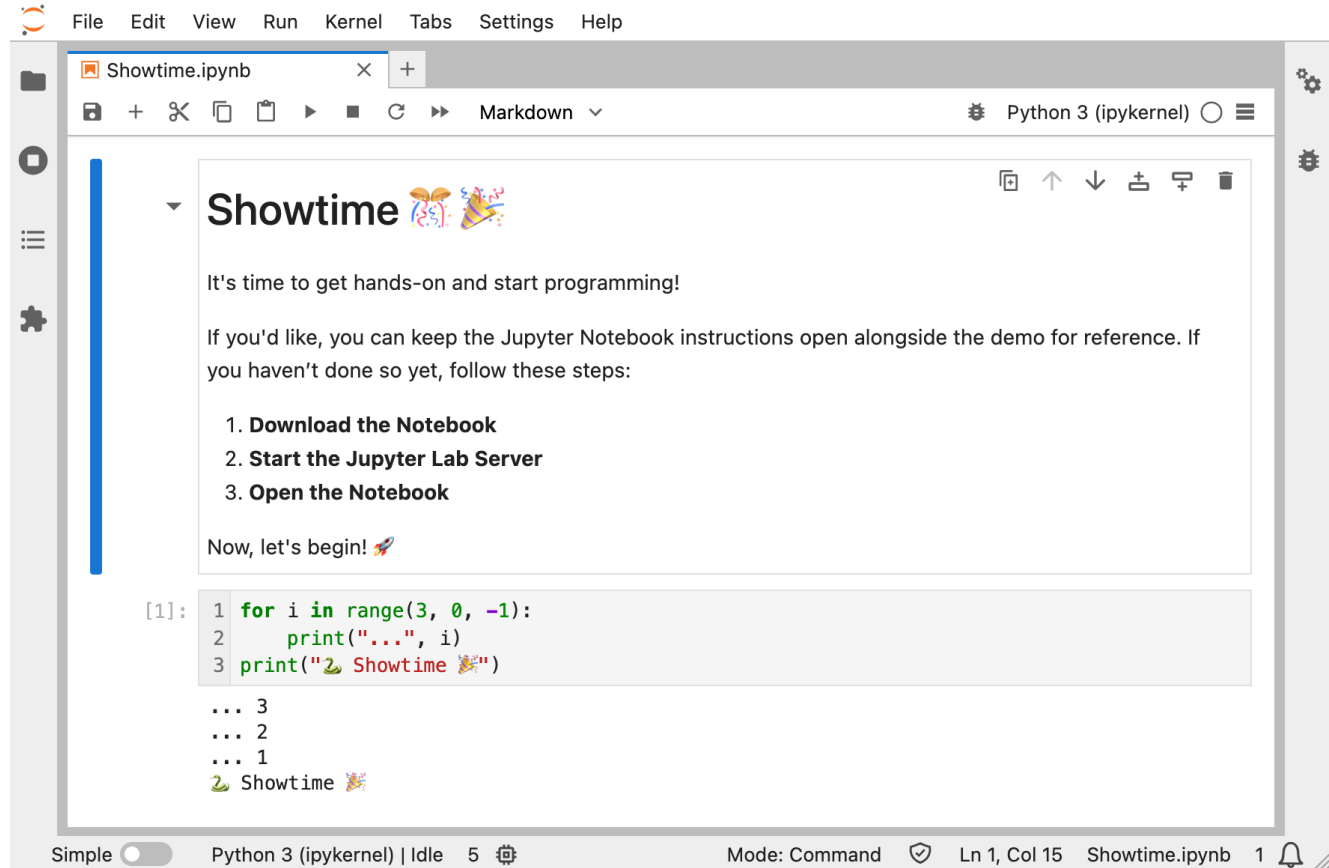
While loop Showtime

Now it's time to get hands on and start programming!

If you like, you can open the [Jupyter Notebook](#) instructions in parallel to the demo.

If you haven't done so yet:

- [Download the Notebook](#)
- [Start the Jupyter Server](#) and open the Notebook



The screenshot shows a Jupyter Notebook window titled 'Showtime.ipynb'. The interface includes a top menu bar (File, Edit, View, Run, Kernel, Tabs, Settings, Help) and a toolbar with icons for file operations and execution. The notebook content is divided into two main sections. The first section, titled 'Showtime' with a party popper emoji, contains text instructions: 'It's time to get hands-on and start programming!', 'If you'd like, you can keep the Jupyter Notebook instructions open alongside the demo for reference. If you haven't done so yet, follow these steps:', a numbered list (1. Download the Notebook, 2. Start the Jupyter Lab Server, 3. Open the Notebook), and 'Now, let's begin!' with a rocket emoji. The second section is a code cell labeled '[1]:' containing a Python for loop that prints '... 3', '... 2', '... 1', and '🎉 Showtime 🎉'. The output of the code cell is visible below the code. The bottom status bar shows 'Simple' mode, 'Python 3 (ipykernel) | Idle', '5' lines, 'Mode: Command', 'Ln 1, Col 15', and the filename 'Showtime.ipynb'.

```
File Edit View Run Kernel Tabs Settings Help

Showtime.ipynb
Python 3 (ipykernel)

Showtime 🎉

It's time to get hands-on and start programming!

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1. Download the Notebook
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3. Open the Notebook

Now, let's begin! 🚀

[1]: 1 for i in range(3, 0, -1):
      2     print("...", i)
      3     print("🎉 Showtime 🎉")
      ... 3
      ... 2
      ... 1
      🎉 Showtime 🎉

Simple Python 3 (ipykernel) | Idle 5 Mode: Command Ln 1, Col 15 Showtime.ipynb 1
```

While loop

Summary / key takeaways

In this unit you learned ...

- ... how to handle the while loop
- ... its syntax and semantics
- ... typical errors
- ... how to make your while loop more powerful using the keyword `break`

