FH AACHEN
UNIVERSITY OF APPLIED SCIENCES

HPI Hasso Plattner Institut
Digital Engineering · Universität Potsdam

Week 3: Complex Data Types

Unit 1: What Are Tuples?

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What are tuples?

Another complex data type is the tuple

- Similar to the list but different intention
  - Lists are used for **many similar** items
  - Tuples are used for items with **many attributes**
  - Example:

    Address consists of zip code, city,

    street, house number
- Syntax:
  - Similar to lists but with parentheses ( )
- Semantics:
  - Tuples are immutable, i.e. you cannot change a value of the

    tuple

```
address = (52066, "Aachen", "Eupener Str. 70", "0241-6009-12345")

student = (
    "Peter",
    "Parker",
    123456,
    "Python for Beginners",
    "pp12345s@university.edu",
    address,
)
```

What are tuples?
Basic operations

- Tuples have an index like lists
  - Actually, square brackets [ ] are used for indexing tuples!
- Sub-tuples can be defined with slicing
- Combination of list of tuples leads to a powerful structure

```
address = (52066, "Aachen", "Eupener Str. 70", "0241-6009-12345")

student = (
    "Peter",
    "Parker",
    123456,
    "Python for Beginners",
    "pp12345s@university.edu",
    address,
)

print(address[0])
print(student[1])
print(student[5])
print(student[5][2])
print(student[-1])
print(address[-3])
print(address[2])
```

```
numbers = (1, 2, "trois", "four", "V", 6)
print(numbers[2:4])
print(len(numbers))
print(numbers.count(1))
print(numbers.index("V"))
```

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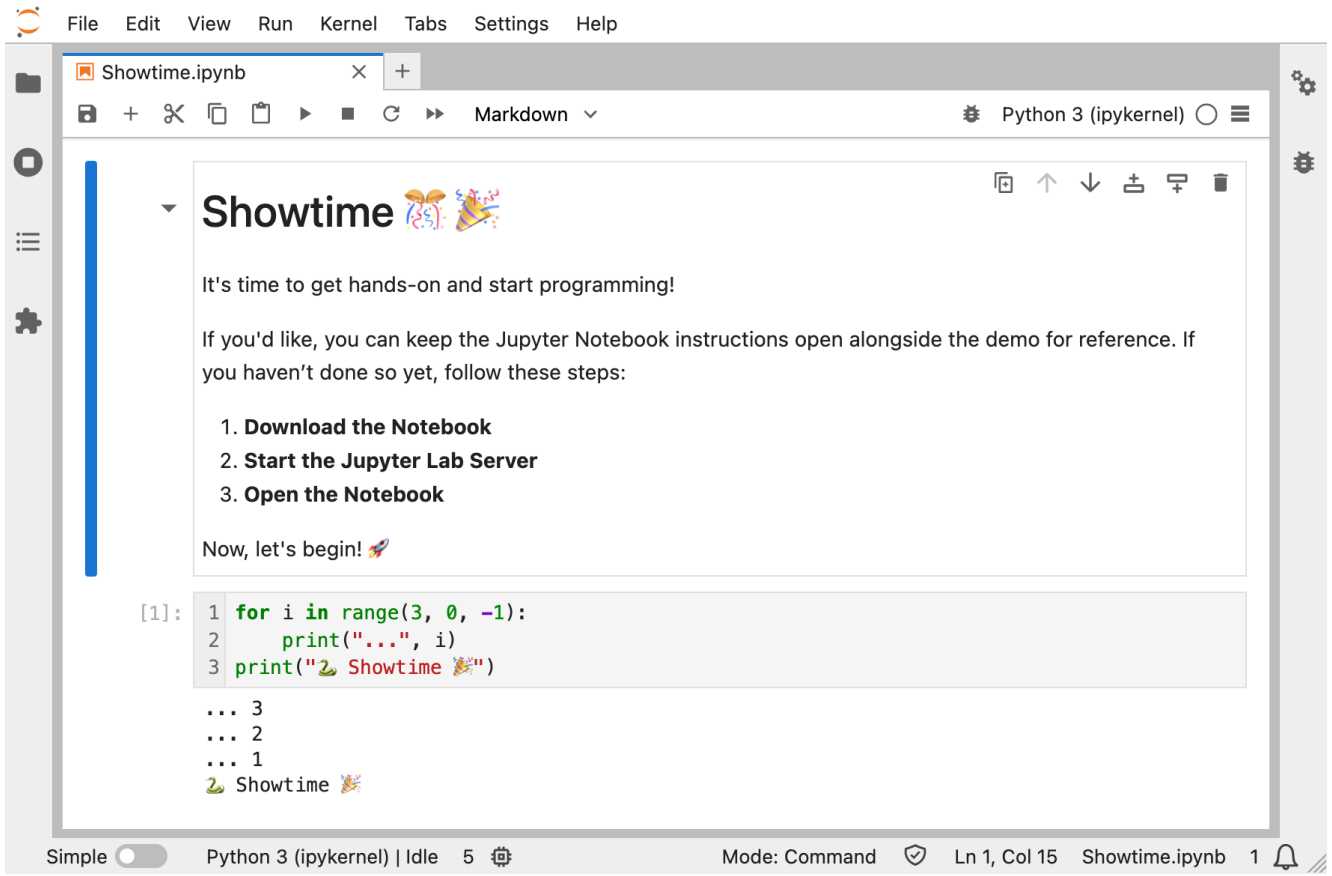
What are tuples? Showtime

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



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What are tuples?
Summary / key takeaways

In this unit you learned ...

- … what tuples are
- … why they are used
- … the differences between lists and tuples
- … basic operations