Python data structures – Lesson overview

In this comprehensive module on **Python data structures**, we'll embark on an exciting journey to **understand** and **utilise** Python's core **data structures - tuples, lists, sets**, and **dictionaries**. As we delve into each structure's theory and practice, our primary focus will be on **applying** these **concepts** to a captivating real-world task: **constructing a digital twin** of a farm. This **practical application** will not only **illustrate the strengths** and uses of each **data structure**, but also **provide** you with **hands-on experience** in **digital representation** and simulation.

By the end of this module, you'll have **developed** a **solid foundation** in Python's **data structures**, equipped to **represent** complex **real-world entities**, like a farm, digitally. **Expect to gain skills** in data **organisation**, efficient information retrieval, and the ability to **apply these structures creatively** to **solve practical problems** in data science and beyond.
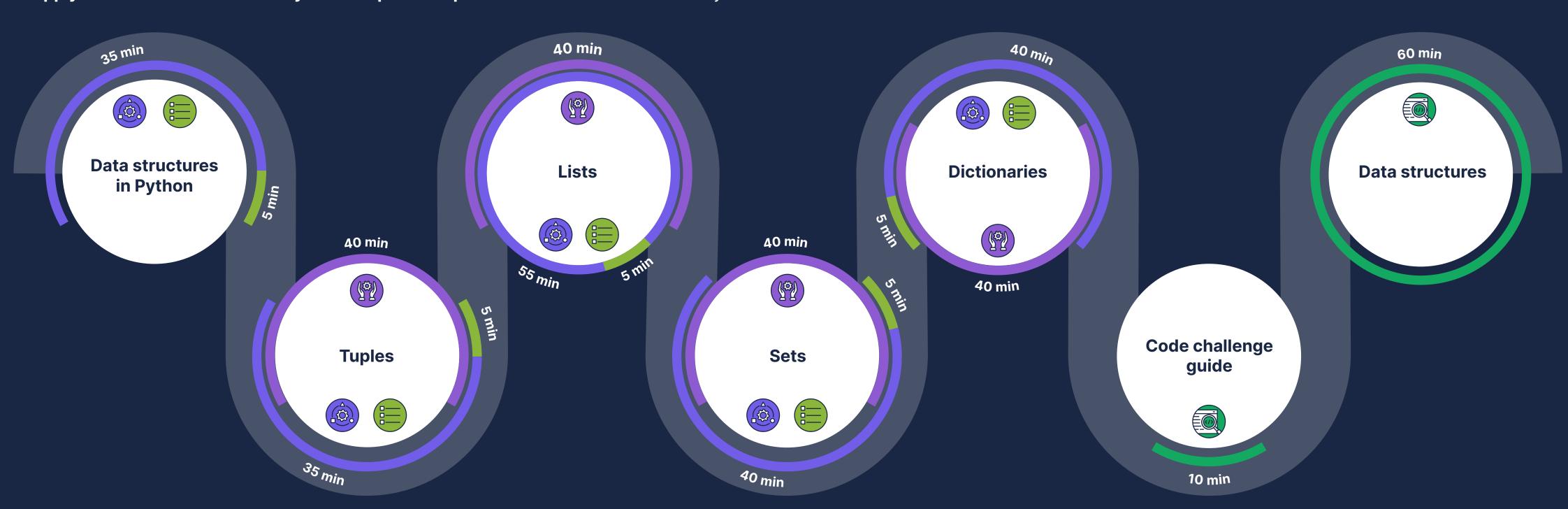
Examples

Knowledge questions

Exercise

Code challenge

35 min

Data structures in Python

5 min

40 min

Tuples

5 min

35 min

40 min

Lists

55 min

5 min

40 min

Sets

5 min

40 min

40 min

Dictionaries

5 min

40 min

60 min

Data structures

Code challenge guide

10 min

Learning objectives

- Identify and describe Python's built-in structures and demonstrate their applications in sample code.

- Clearly differentiate mutable structures (lists, dictionaries) from immutable ones (tuples), with examples illustrating their mutability.

- Demonstrate the creation, modification, and basic manipulation of tuples, lists, sets, and dictionaries in Python through guided exercises.

- Identify and explain key characteristics of each data structure, like the immutability of tuples and the ordered nature of lists, with relevant examples.

- Master efficient data storage and retrieval techniques using Python's data structures, emphasising their importance in programming and data analysis.

- Apply Python data structures to a series of real-world scenarios, illustrating their practical usage in data analysis and programming.