

## Lesson 3: Data Structures

### ◇ Introduction

In this lesson, we'll explore Python's built-in data structures — the tools that let you store, organize, and manipulate data efficiently. These are essential building blocks for every Python developer.

By the end of this lesson, you'll:

- Understand different types of data structures in Python.
- Learn how and when to use lists, tuples, sets, and dictionaries.
- Practice examples that use each structure.

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### ◇ 1. Lists – Ordered, Mutable Collections

Lists are ordered collections that can hold items of different types. They are mutable, meaning you can change their content.

✓ Use lists when:

- You need to store items in a specific order.
- You want to modify (add/remove) elements later.

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### ◇ 2. Tuples – Ordered, Immutable Collections

Tuples are like lists but immutable — once created, they cannot be changed.

✓ Use tuples when:

- You want a fixed set of values (e.g., coordinates, RGB colors).
- You want data to be protected from accidental changes.

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### ◇ 3. Sets – Unordered, Unique Collections

Sets are unordered collections that only store unique elements.

✓ Use sets when:

- You need to eliminate duplicates.
- You need fast membership testing (`x in my_set`).

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### ◇ 4. Dictionaries – Key-Value Pairs

Dictionaries store data in pairs: keys and values. They are like mini-databases.

✓ Use dictionaries when:

- You want to associate keys with values.
- You need quick access to data using keys.

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### ◇ Outro

Great job! 🎉 In this lesson, you learned about:

- Lists – for ordered and changeable items
- Tuples – for fixed collections
- Sets – for unique items
- Dictionaries – for key-value pairs

These data structures are the foundation of writing real-world Python programs. You'll keep using them in every app you build.