Chapter 2: Data Structures

Lesson 4: Dictionaries

A **dictionary** in Python is a built-in data structure that stores key-value pairs. It is **unordered**, **mutable**, and allows **fast lookups**.

Key Features:

- Defined using `{}` or the `dict()` constructor.
- Keys must be **unique** and **immutable** (e.g., strings, numbers, tuples).
- Values can be **any** data type.

Example:

```
# Creating a dictionary
student = {
    "name": "Alice",
    "age": 21,
    "major": "Computer Science"
}

# Accessing values
print(student["name"])  # Output: Alice

# Adding a new key-value pair
student["grade"] = "A"

# Updating a value
student["age"] = 22

# Removing a key
del student["major"]
```

Dictionary Methods:

Method	Description
`dict.get(key, default)`	Returns the value for a key; avoids KeyError
`dict.keys()`	Returns all keys
`dict.values()`	Returns all values
`dict.items()`	Returns key-value pairs as tuples

Method	Description
`dict.pop(key, default)`	Removes and returns the value for a key
`dict.update(other_dict)`	Merges another dictionary

Dictionaries are widely used for **data storage**, **configuration settings**, **caching**, and **JSON-like structures** in Python. 🚀