Dictionary Basics

What is a Dictionary?

- A **dictionary** is a collection of **key-value pairs**.
- Each item has a **key** and its corresponding **value**.
- Keys must be **unique** and **immutable** (string, number, tuple).
- Values can be of any type.
- Written with curly braces {}.

Example:

```
student = {
    "name": "Ali",
    "age": 20,
    "grade": "A"
}print(student)
```

Characteristics of Dictionaries:

1. **Key-Value Pairs** → each value is accessed using its key.
2. **Unordered (before Python 3.7)**, but **insertion ordered (from Python 3.7+)**.
3. **Mutable** → can add, remove, change values.
4. **Keys must be unique**, but values can be duplicate.

- **Accessing Values**
- **Updating Dictionary**

Common Dictionary Methods:

- keys() → returns all keys.
- values() → returns all values.
- items() → returns key-value pairs.
- update() → adds or updates dictionary.
- pop(key) → removes key-value pair.
- clear() → empties dictionary.

Importance of Dictionaries:

- Fast data lookup using keys.
- Best for **structured data** (like database records).
- Used heavily in APIs, JSON, data storage.