Ch-6 Python Fundamental

Knowledge of Python Data Types

In Python, **data types** define the **type of value** a variable can hold. Python is **dynamically typed**, so you don't need to declare the type explicitly.

1. Number Types

Data Type	Description	Example
int	Integer values	x = 10
float	Decimal/Real numbers	pi = 3.14
complex	Numbers with real and imaginary parts	z = 2 + 3j

Complex numbers are written as a + bj where j is imaginary part.

2. Boolean Type

Data Type	Description	Example
bool	Represents True or False	status = True

Boolean values are internally treated as 1 (True) and 0 (False).

3. Sequence Types

a. String

- A collection of characters enclosed in quotes.

name = "Python"

b. List

- Ordered, **mutable**, allows duplicate elements.

fruits = ["apple", "banana", "mango"]

c. Tuple

- Ordered, **immutable**, allows duplicates.

coordinates = (10, 20)

4. None Type

Data Type	Description	Example
None	Represents absence of value or null value	x = None

Often used in functions when no return value is needed.

5. Mapping Type

Data Type	Description	Example
Dictionary	Key-value pair data structure	student = {"name": "Ravi", "age": 16}

Keys must be **unique and immutable**, values can be of any type.

Mutable vs Immutable Data Types

Category	Data Types	Can be changed?
Mutable	List, Dictionary, Set	Yes
Immutable	int, float, string, tuple, bool, complex	No

Example Summary

```
a = 10          # int
b = 3.14        # float
c = 2 + 3j      # complex
d = True        # bool
e = "Python"    # string
f = [1, 2, 3]   # list
g = (4, 5, 6)   # tuple
h = None        # NoneType
i = {"key": "value"}  # dictionary
```