### Python Variables and Variable Types

**Variables**

* Variables store data in memory.
* Created when you assign a value using =.
* No need to declare type explicitly.
* Example: name = "Alice", age = 25

**Rules for Variable Names**

* Start with a letter or underscore (\_).
* Contain letters, numbers, or underscores.
* Case-sensitive (Age ≠ age).
* Avoid Python keywords (e.g., if, for).

**Variable Types**  
Python is dynamically typed; types are determined at runtime. Common types:

1. **Integer (int)**
   * Whole numbers.
   * Example: count = 10
2. **Float (float)**
   * Decimal numbers.
   * Example: price = 19.99
3. **String (str)**
   * Text, enclosed in ' ' or " ".
   * Example: message = "Hello"
4. **Boolean (bool)**
   * True or False values.
   * Example: is\_active = True
5. **List (list)**
   * Ordered, mutable collection.
   * Example: numbers = [1, 2, 3]
6. **Tuple (tuple)**
   * Ordered, immutable collection.
   * Example: coordinates = (10, 20)
7. **Dictionary (dict)**
   * Key-value pairs.
   * Example: person = {"name": "Bob", "age": 30}
8. **Set (set)**
   * Unordered, unique items.
   * Example: unique = {1, 2, 3}

**Checking Type**

* Use type() function.
* Example: type(age) returns <class 'int'>

**Type Conversion**

* Convert between types using functions like int(), float(), str().
* Example: num = int("5") converts string "5" to integer 5.

**Key Notes**

* Variables can change type by reassignment (e.g., x = 5; x = "text").
* Use meaningful variable names for clarity.
* Python handles memory management automatically.