

# Variables and Data Types

Day 2 - Python Basics

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# Agenda

Python Online Free Ramzan Course 2025  
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- 1 What are variables?
- 2 Rules for naming variables
- 3 Data types in Python
- 4 Type conversion
- 5 Hands-on practice

# What are Variables?

- **Definition:** A variable is a container for storing data.
- **Example:**

```
name = "Ali"  
age = 25
```

  - name and age are variables.
  - "Ali" and 25 are values stored in the variables.
- **Why use variables?**
  - Store and reuse data.
  - Make code dynamic and readable.

# Rules for Naming Variables

1. Variable names must start with a letter or underscore (`_`).
  - Valid: `name`, `_age`
  - Invalid: `1name`, `@age`
2. Variable names can only contain letters, numbers, and underscores.
  - Valid: `name1`, `user_name`
  - Invalid: `user-name`, `name!`
3. Variable names are case-sensitive.
  - `age`, `Age`, and `AGE` are different variables.
4. Avoid using Python keywords (e.g., `print`, `if`, `for`).

# Data Types in Python

- **Text Type:** str (e.g., "Hello")
- **Numeric Types:**
  - int (e.g., 10)
  - float (e.g., 10.5)
- **Boolean Type:** bool (e.g., True, False)
- **Example:**

```
name = "Ali"          # str
```

```
age = 17              # int
```

```
height = 5.9         # float
```

```
is_student = True    # bool
```

# Checking Data Types

- Use the `type()` function to check the data type of a variable.
- **Example:**

```
print(type("Hello")) # Output: <class 'str'>
print(type(10))       # Output: <class 'int'>
print(type(10.5))     # Output: <class 'float'>
print(type(True))     # Output: <class 'bool'>
```

# Type Conversion

- **Implicit Conversion:** Python automatically converts one data type to another.

```
num1 = 10      # int
```

```
num2 = 5.5     # float
```

```
result = num1 + num2 # result is  
float (15.5)
```

- **Explicit Conversion:** You can manually convert data types using functions like `int()`, `float()`, `str()`.

```
num = "10"     # str
```

```
num = int(num)  # Convert to int
```

```
print(num + 5)  # Output: 15
```

# Hands-On Practice

- **Task 1:** Create variables to store your name, age, and height. Print them.

```
name = "Ali"  
age = 17  
height = 5.9  
print(name, age, height)
```

- **Task 2:** Check the data types of the variables.

```
print(type(name))  
print(type(age))  
print(type(height))
```

- **Task 3:** Convert a string to an integer and perform addition.

```
num1 = "10"  
num2 = 5  
result = int(num1) + num2  
print(result) # Output: 15
```



# Recap

- What are variables?
- Rules for naming variables.
- Data types in Python.
- Type conversion.

# Homework

1. Create variables to store your favorite book, its price, and whether you've read it. Print them.
2. Convert a float to an integer and print the result.
3. Write a program to add two numbers entered by the user.

## Q&A

- Do you have any questions?
- Share your thoughts or challenges.

# Closing

**Next class:** Input and Output.