Python Data Types and Variables

Lecture Series: Introduction to Python Programming

What Are Variables?

- A variable is a container that temporarily stores data during the execution of a program.
- The value in a variable can change during the program's execution.
- Think of a variable like a glass holding water—the glass is the variable, the water is the data.

Rules for Naming Variables

- Python variable names must follow these rules:
- Start with a letter or underscore (_)
- Cannot start with a number
- Can include only letters, numbers, and underscores
- Are case-sensitive
- Must not use reserved Python keywords
- Should be meaningful and descriptive

Variable Naming Conventions

Convention	Example
Snake Case	user_name
Camel Case	userName
Pascal Case	UserName

Initializing Variables

- Creating a variable requires a name, an assignment operator, and a value.
- Example: fruit = "apple"
- Example: a = 10

Python Data Types

Data Type	Description	Examples
Integer	Whole numbers	10, -5, 1000
Float	Decimal numbers	3.14, -0.001
String	Text in quotes	'hello', "123"
Boolean	True or False	True, False

Practical Examples

- Examples of assigning different types of data to variables:
- country = "Pakistan" # String
- age = 25 # Integer
- price = 99.99 # Float
- is_active = True # Boolean

Case Sensitivity and Invalid Names

- Python variables are case-sensitive and must follow naming rules.
- FirstName = "Ali" vs firstname = "Ahmed"
- Invalid: 1user = "Ali" (starts with a number)
- Invalid: print = 10 (uses a reserved keyword)

Best Practices for Naming Variables

- Follow these best practices to write clean and maintainable code:
- Use a consistent naming convention throughout your code.
- Use descriptive and meaningful names.
- Avoid reserved Python keywords.

Conclusion

- Summary of what you learned in this lecture:
- Variables temporarily store data during program execution.
- Naming rules and conventions ensure code readability.
- Python supports various data types like int, float, str, and bool.
- Next: Explore more data types and practical use in VS Code.