

Variables and Data Types

Variables and Data Types

1. Introduction

- Variables are used to store data in a program. They act as placeholders for values that can be manipulated or accessed within the program.
- Data types define the type of data that a variable can hold and the operations that can be performed on it.

2. Common Data Types

- **Integer (int)**: Used to store whole numbers without any decimal points.
- **Floating-point (float)**: Used to store numbers with decimal points.
- **String (str)**: Used to store text or a sequence of characters.
- **Boolean (bool)**: Represents a binary value, True or False.
- **List**: Used to store a collection of items in a specific order.
- **Tuple**: Similar to a list but immutable (cannot be changed).
- **Dictionary**: Stores data in key-value pairs.

3. Declaring Variables

- Variables are declared by assigning a value to them using the assignment operator (=).

```
age = 25
name = "Alice"
is_student = True
```

4. Type Conversion

- Sometimes, it is necessary to convert data from one type to another.
- This can be done using functions like `int()`, `float()`, `str()`, etc.

```
num = 10
str_num = str(num) # Convert integer to string
```

5. Variable Naming Rules

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- Variable names can contain letters, numbers, and underscores but cannot start with a number.
- They are case-sensitive.
- Choose meaningful and descriptive names to improve code readability.

6. Best Practices

- Initialize variables before using them to avoid errors.
- Use consistent naming conventions for variables to maintain code clarity.
- Be mindful of the data type being used to prevent unexpected results.

7. Summary

- Variables are essential in programming to store and manipulate data.
- Data types define the characteristics and operations that can be performed on the data.
- Understanding variables and data types is fundamental for writing efficient and error-free code.