

Variables and Data Types

Variables and Data Types

1. Variables:

- Variables are used to store data in a program.
- They have a name, a type, and a value.
- The value of a variable can be changed during the execution of a program.
- Variables must be declared before they can be used.

2. Data Types:

- Data types define the type of data that a variable can hold.
- Common data types include:
 - **Integer (int)**: Used for whole numbers.
 - **Float (float)**: Used for numbers with decimal points.
 - **String (str)**: Used for text.
 - **Boolean (bool)**: Used for True/False values.
 - **List**: Used to store a collection of items.
 - **Tuple**: Similar to a list but immutable.
 - **Dictionary**: Used to store key-value pairs.

3. Type Conversion:

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

4. Dynamic Typing:

- In languages like Python, variables are dynamically typed.
- This means that a variable can hold different types of data at different points in the program.

5. Naming Conventions:

- Variables should have meaningful names that describe the data they hold.
- Use lowercase letters for variable names and underscores to separate words (e.g., `my_variable`).

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6. Constants:

- Constants are variables whose values do not change during the execution of a program.
- In Python, constants are typically written in uppercase (e.g., `PI = 3.14159`).

Understanding variables and data types is fundamental to writing programs that manipulate and process data effectively.