Day 3: Variables & Data Types in C++

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# 1. What are Variables?

Variables are containers used to store data in a program. They must be declared with a data type so the compiler knows what kind of data will be stored.

# 2. Data Types (Primitive)

- \*\*int\*\*: Stores whole numbers (e.g., 1, -10, 25)

- \*\*float\*\*: Stores decimal numbers or real numbers (e.g., 3.14, -2.5)

- \*\*char\*\*: Stores a single character (e.g., 'A', 'b', '1')

- \*\*string\*\*: Stores a sequence of characters (e.g., "Hello")

- \*\*bool\*\*: Stores boolean values - true or false (0 is false, 1 is true)

# 3. Extended Data Types

- \*\*long\*\*: Used with int to store larger integers (typically 4 bytes)

- \*\*double\*\*: A bigger version of float for storing decimal numbers (8 bytes)

# 4. Size of Data Types

You can use the `sizeof()` function to check how much memory (in bytes) a data type or variable takes.

# 5. Escape Sequences & Manipulators

- \*\*\n\*\*: New line character

- \*\*\t\*\*: Tab character

- \*\*endl\*\*: Output manipulator to move to the next line

# 6. Declaring Constants

- Use `const` to declare constant variables:

Example: const float PI = 3.14;

- Use `#define` for macro constants:

Example: #define PI 3.14