

Variables

A variable is a named storage location in a program's memory where data can be stored, manipulated, and accessed.

Declaration:

Before using a variable, it must be declared, specifying its data type (int, float, char, etc.).

Initialization:

Variables can be assigned an initial value at the time of declaration.

Example:

```
1 int age; // Declaration of an integer variable
2 float salary = 50000.50; // Declaration and initialization of a float variable
```

Data Types:

Variables must have a specific data type which determines the kind of values they can hold (integer, floating-point, character, etc.).

Naming Conventions:

Variables:

Must start with a letter or an underscore.

Can contain letters, digits, and underscores.

Case-sensitive (e.g., myVariable, MyVariable, my_variable are different).

Constants:

Usually named in uppercase to differentiate them from variables (e.g., MAX_SIZE, PI).

Scope:

Local Variables:

Variables defined within a specific block, function, or loop. Accessible only within that scope.

Global Variables:

Defined outside of any function. Accessible throughout the entire program

Constants

A constant is a value that remains unchanged during the execution of a program. Constants are declared using the `const` or `define` keywords.

Types:

Integer Constants: Whole numbers (e.g., 10, -5).

Floating-Point Constants: Real numbers (e.g., 3.14, -0.005).

Character Constants: Individual characters (e.g., 'A', 'b').

Mathematical Constants:

Often defined using preprocessor directives (e.g., `#define PI 3.14159`).