Variable Declaration in C Programming

Susmita Buragohain

Roll No: 2, MCA 1st

November 12, 2024

Contents

What is a Variable?

- A variable is a storage location in memory with a symbolic name (identifier).
- Used to store data that can be changed during program execution.
- Variables make it easier to reuse data and make programs flexible.

Example: In a program that calculates total cost, a variable could store the value of an item price.

Variable Declaration Syntax

- In C, variables must be declared with a data type before use.
- Syntax:

```
datatype variable_name;
```

- Example:

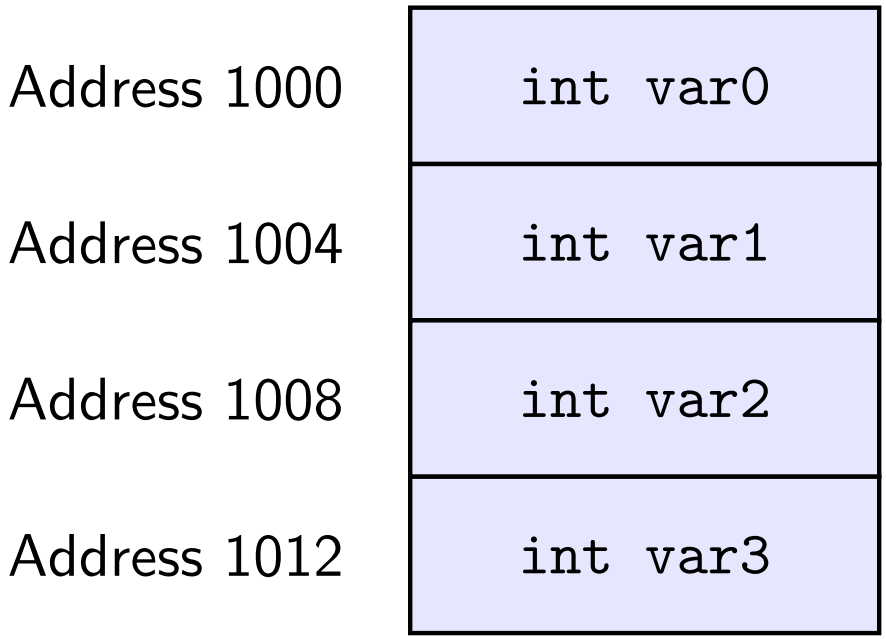
```
int age;
```

Common Data Types

- `int` - for integers
- `float` - for floating-point numbers
- `char` - for characters

Memory Representation of Variables

- Each variable is stored at a unique memory location.
- Variables take up memory based on their data type size.



Explanation: Each variable takes up memory based on its data type. In this example, each integer takes 4 bytes.

Real-Life Example of Variables

- Imagine a program that tracks the stock quantity of a store.
- Each item can be stored as a variable with a unique name.

C Code Example

```
int apples = 50;
float price = 1.25;
char grade = 'A';
```

Explanation: Variables store different types of information (integer for quantity, float for price, char for grade).

Variable Initialization and Assignment

- Initialization is assigning an initial value when declaring the variable.
- Syntax:

```
datatype variable_name = value;
```

- Example:

```
int age = 25;
```

Note: Variables can also be assigned values later in the code.

Scope of Variables

- Variables have scope, which determines where they can be accessed.
- **Local Variables:** Declared inside a function or block and accessible only within that scope.
- **Global Variables:** Declared outside all functions and accessible throughout the program.

Example

```
int globalVar = 5; // global variable
void func() { int localVar = 10; } // local variable
```

Conclusion

- Variables are essential in C programming, serving as placeholders for data.
- Proper declaration, initialization, and understanding of scope enhance code functionality.
- Variables enable flexibility and reusability in programs.

Thank You!