Day 1: C Programming - Variables, Data Types & Arithmetic Expressions

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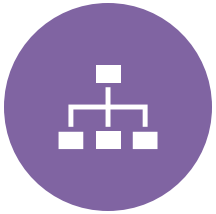
Previous.

Understand what programming and C are

-Compile and run basic programs

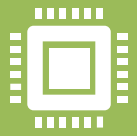


-Understand program structure

-Get familiar with an IDE

Hook for Lecture

Have you ever tried calculating your expenses, average marks, or simple interest manually?



What if I told you, you could make the computer do all that in milliseconds?

Today we will learn how to make a computer do calculations using C programming.

Understanding Pseudocode and Flowcharts

Pseudocode and Flowcharts are tools for algorithm design.

Use pseudocode for writing logic.

Use flowcharts for visualizing flow.

Both help in building better programs.

Algorithm, Pseudocode & Flowchart - 1

Algorithm & Flowchart to find the sum of two numbers

Algorithm

Step-1 Start

Step-2 Input first numbers say A

Step-3 Input second number say B

Step-4 SUM = A + B

Step-5 Display SUM

Step-6 Stop

Pseudocode

Begin

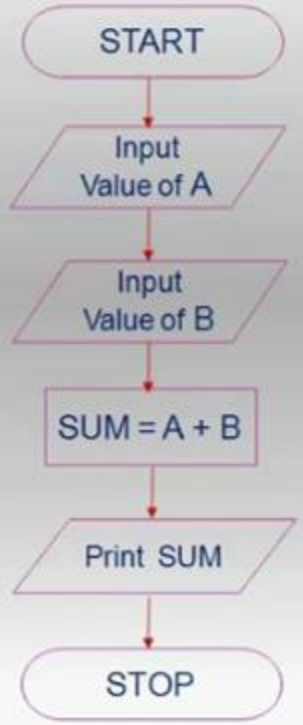
Input A

Input B

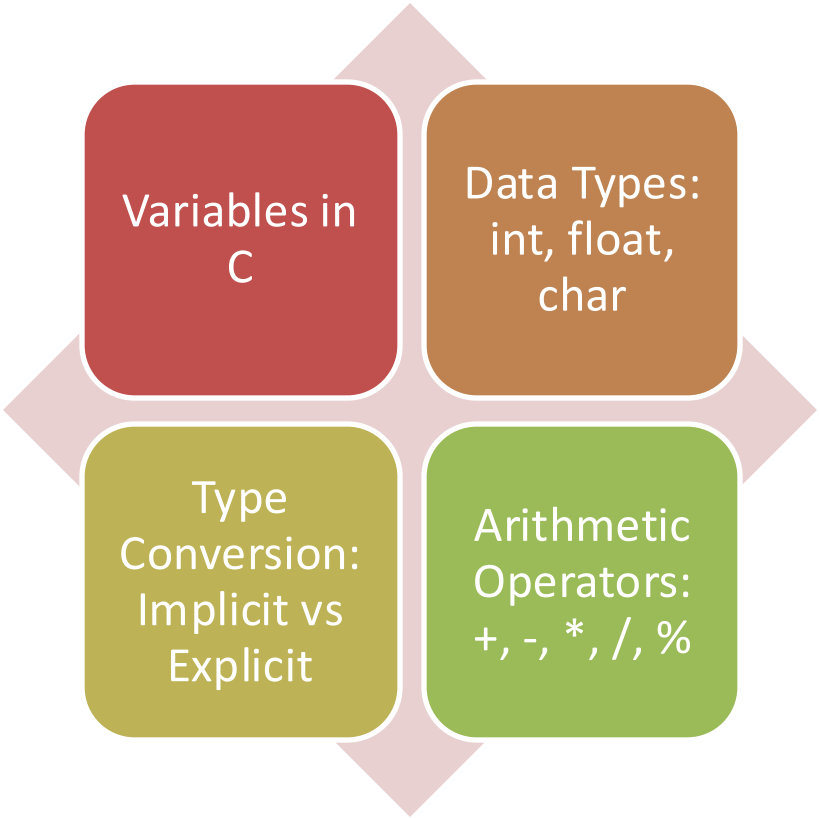
Compute SUM = A + B

Print SUM

End



Topics for Today



1. Variables in C

Variables are containers to store data values.

Syntax: dataType variableName = value;

Example: int age = 21;

2. Data Types

int: for integers (e.g., 10, -5)

float: for decimal values (e.g., 3.14)

char: for single characters (e.g., 'A')

Note: No 'bool' in traditional C

3. Arithmetic Operators

- Addition: +
- Subtraction: -
- Multiplication: *
- Division: /
- Modulus: % (remainder)

4. Type Conversion

Implicit: Done automatically by compiler

Example: int + float → float

Explicit: Done manually using casting

Example: (int)3.14 → 3

Hands-on Practice: Code 1

- ***Take 2 numbers from user and show sum, difference, and product:***

```
#include<stdio.h>
int main() {
    int a, b;
    printf("Enter two numbers: ");
    scanf("%d %d", &a, &b);
    printf("Sum = %d\n", a + b);
    printf("Difference = %d\n", a - b);
    printf("Product = %d\n", a * b);
    return 0;
}
```

Hands-on Practice: Code 2

- ***Calculate Area of Circle:***

```
#include<stdio.h>
#define PI 3.14
int main() {
    float r;
    printf("Enter radius: ");
    scanf("%f", &r);
    float area = PI * r * r;
    printf("Area = %.2f\n", area);
    return 0;
}
```

Hands-on Practice: Code 3

- ***Simple Interest Calculation:***

```
#include<stdio.h>
int main() {
    float p, r, t;
    printf("Enter principal, rate, time: ");
    scanf("%f %f %f", &p, &r, &t);
    float si = (p * r * t) / 100;
    printf("Simple Interest = %.2f\n", si);
    return 0;
}
```

Hands-on Practice: Code 4

- ***Average of 3 numbers:***

```
#include<stdio.h>
int main() {
    float a, b, c;
    printf("Enter 3 numbers: ");
    scanf("%f %f %f", &a, &b, &c);
    float avg = (a + b + c) / 3;
    printf("Average = %.2f\n", avg);
    return 0;
}
```

Type Casting Example

```
#include<stdio.h>
    int main() {
    float a = 5.9;
    int b = (int)a;
    printf("Value after casting = %d\n", b);
    return 0;
}
```

Goal of the Day

Understand variable declaration and usage

Perform basic arithmetic using operators

Learn type conversions (implicit & explicit)

Practice basic input/output and problem-solving