

Lab 1: Introduction to C++

Objectives

- Get familiar with the structure of a C++ program.
- Learn how to write, compile, and run a basic program.
- Practice input/output (cin and cout).
- Understand variables and basic data types.

Part 1: Structure of a C++ Program

- Every C++ program has:

```
#include <iostream> // header file for input/output

using namespace std; // to avoid writing std::

int main() {
    // Code goes here
    return 0; // program ends
}
```

Part 2: First Program – Hello World

```
#include <iostream>
using namespace std;

int main() {
    cout << "Hello, World!" << endl;
    return 0;
}
```

Compile and run this program.

Expected output:

```
Hello, World!
```

Part 3: Variables and Data Types

C++ has several basic data types:

- `int` → whole numbers (e.g., 10, -5)
- `float` / `double` → decimals (e.g., 3.14)
- `char` → single character (e.g., 'A')
- `string` → words/text (needs `#include <string>`)
- `bool` → true/false

Example:

```
#include <iostream>
using namespace std;

int main() {
    int age = 20;
    double gpa = 3.7;
    char grade = 'A';
    string name = "Ali";
    bool passed = true;

    cout << "Name: " << name << endl;
    cout << "Age: " << age << endl;
    cout << "GPA: " << gpa << endl;
    cout << "Grade: " << grade << endl;
    cout << "Passed? " << passed << endl;

    return 0;
}
```

Part 4: Input from User

Use cin to get values:

```
#include <iostream>
using namespace std;

int main() {
    int age;
    cout << "Enter your age: ";
    cin >> age;
    cout << "You are " << age << " years old." << endl;
    return 0;
}
```

Lab Exercises

1. Write a program to display your name, age, and favorite hobby.
2. Ask the user for two numbers and print their sum.
3. Write a program that takes a student's name and grade, then prints a message like:
Ali got grade A.