Topic 1-2
Your first C++ Program

C vs C++

- C++ is derived from the C language.
- The ++ is an operator in the language (we will use soon).
- C was developed by Dennis Ritchie of AT&T Bell Laboratories in the 1970s.
- It was first used for writing and maintaining the UNIX operating system.
- C is a high-level language with many of the features of a low-level language.

Dennis Ritchie

American computer scientist

Dennis MacAlistair Ritchie was an American computer scientist. He created the C programming language and, with long-time colleague Ken Thompson, the Unix operating system and B programming language. Wikipedia

Born: 9 September 1941, Bronxville, New York, United States

Died: 12 October 2011, Berkeley Heights, New Jersey, United States

C vs C++

- **C has some shortcoming**
  - not being easy to understand as other languages
  - Not have as many automatic checks as some other high-level languages.
  - etc
- **Bjarne Stroustrup of AT&T Bell Laboratories developed C++ in the early 1980s.**
  - Most C programs are also C++ programs. (The reverse is not true)
- **C++ has facilities to do object-oriented programming!**

Object-oriented programming (OOP)

- **In OOP, a program is viewed as a collection of interacting objects.**
- **For example, a program to manage a Zoo**
  - The animals, the visitors, the staff, the buildings and the ticket all will be objects.
  - A visitor **buys** a ticket to **enter** a building.
  - An animal has a name, weight, age, etc.
- **Each object has algorithms that describe how it should behave in different situations.**
- **Later in the semester, we will use:**
  - Encapsulation
  - Inheritance between objects
  - etc

Your first C++ program

```
#include <iostream>

int main(){

    std::cout << "Hello World!" << std::endl;

    return 0;
}
```

The starting point of a C++ program

```
dayoub@:lect1$ g++ main.cpp
dayoub@:lect1$ ls
a.out  main.cpp
dayoub@:lect1$ ./a.out
Hello World!
dayoub@:lect1$
```

C++ uses { and } to group statements together and separates statements with a semicolon ';'.

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Let's add two numbers

```cpp
#include <iostream>

int main(){

    int a , b , c;

    std::cout << "Enter the first number:\n";
    std::cin >> a;


    std::cout << "Enter the second number:\n";
    std::cin >> b;

    c = a + b;
    std::cout << "a+b = " << c << std::endl;

    return 0;
}
```

We need to declare variables before we use them.

Good practice to initialise them (see the demo in the lecture video).

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Variables

- **C++ requires us to declare them before use.**
- **When we first assign a value to a variable, often when we create it, we are initialising it.**
- **Any further changes to the value in the variable are assignments.**
- **To assign ‘3’ to the already existing x, we would use:**

```
x = 3; // Note that semicolon
```