C++ Programming
Let's code

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Simple Calculator

- **Program** is a set of instructions
  - Read number 1
  - Read operations
  - Read number 2
  - Click Equal
  - E.g. 3 + 5 = 8
- **Programming Language**
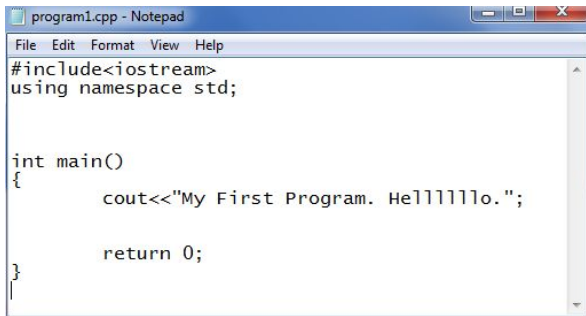 - is used to write these instructions (**source code**)

Writing a program

- A comput program is a
  - **Sequence** of **instructions** given to the computer
    - Read number
    - Write 2 * number + 1
  - A programming language is used to write these instructions
  - They must be written in a specific format (respecting **syntax rules**)
- C++ **Compiler**
  - Do you follow syntax rules? If no: compiler errors & warnings
  - If everything is ok, compiler generates **object code** files (machine language)
  - A **linker** combines these object code files into an **executable**.
  - Computer's CPU knows how to **run** this executable
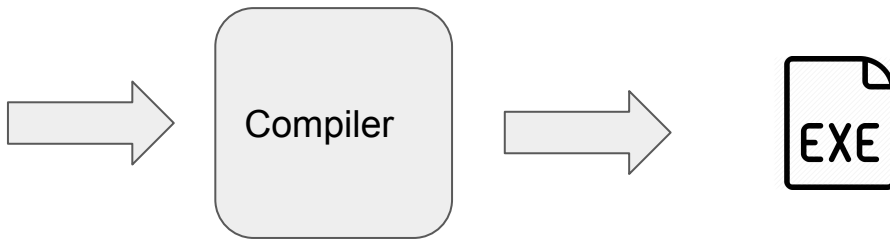
C++ Program Life Cycle

- ● 1) **Write** the Code (computer program)
- ● 2) **Compile** it (lots of *internal* steps)
  - ○ 3) Generates a program (e.g. code**.exe** file on windows)
- ● 4) **Run** the executable

Img src

Your first program

- Write a program to **print on the screen** the following statement
  - **My First Program. Helllllllo.**

```cpp
program1.cpp - Notepad
File  Edit  Format  View  Help
#include<iostream>
using namespace std;


int main()
{
        cout<<"My First Program. Helllllllo.";

        return 0;
}
```
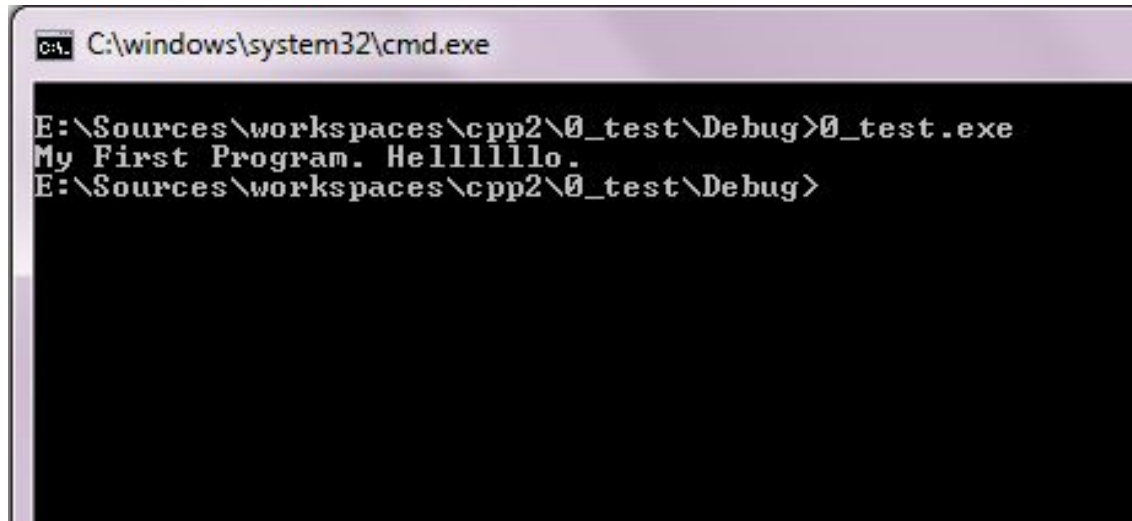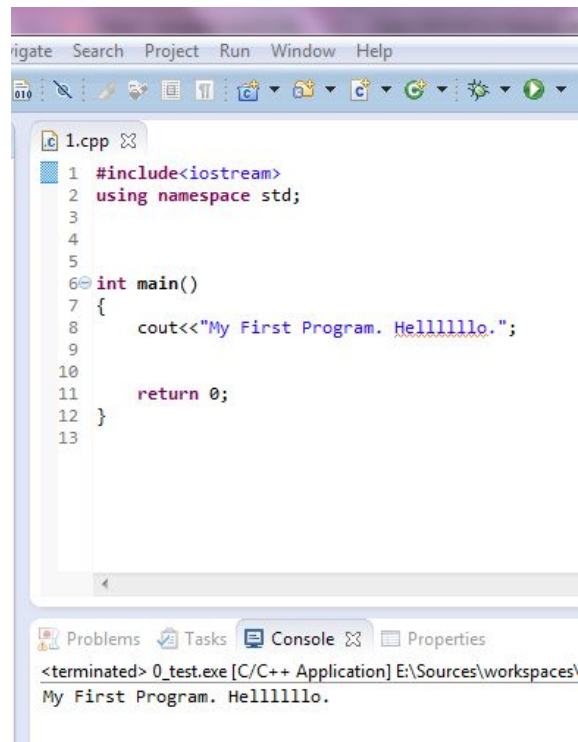
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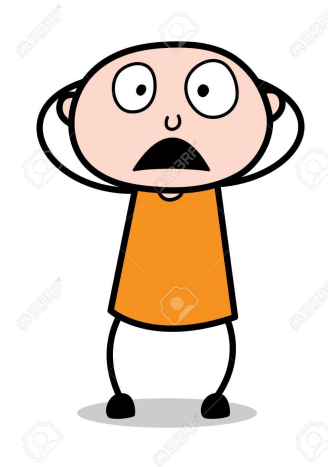
Compile and Run Exe (Console Screen)

Back to the code

- Line 8: It says
  - **C**out<<
    - This is a **command** to print (cout = Console output)
    - << (later)
  - "My First Program. Helllllllo."
    - This is what to print. Notice the double quotes " "
  - ;
    - This is an end of line, like full stop for humans
      - Notice it in lines also 2 and 11
- Line 1: iostream *header*. Io for input/output
  - It helps in reading and writing
- Other lines: **Just write** in every program
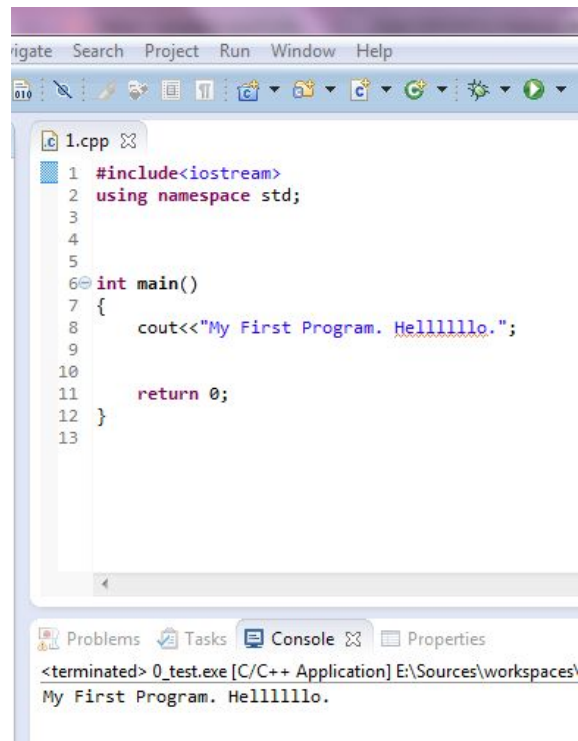
Back to the code: **Optional**

- #include
  - We have several things ready for you to use!
  - Let's say you want to calculate √25, which is 5
  - #include<cmath> ⇒ sqrt(25)
  - Ok, I want to read and write from the disk?
  - #include<iostream> handles that for you (e.g. cout)

- Using namespace std;
  - It contains all standard names used in C++
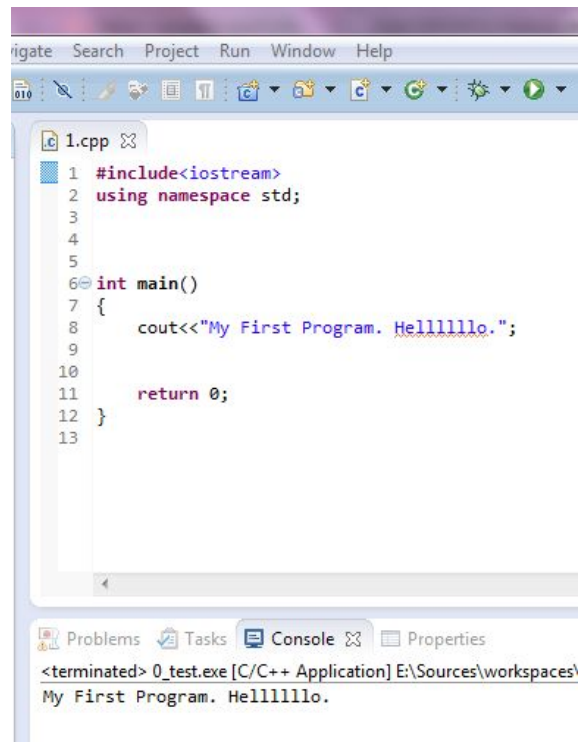 - More later

Back to the code: **Optional**

- Int main()
  - This is called the main **function**
  - A c++ program must have it (**case sensitive**)
  - **Return** 0
    - Function is done successfully
    - Return means: finish and make the caller resumes
  - ()
    - Called (round) brackets (aka **parentheses)**
    - You can put numbers: e.g. sqrt(25)
- **Braces** in lines 7 and 12: { }
  - We write code body between them. More later

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."