Programming 4 kids

Introduction

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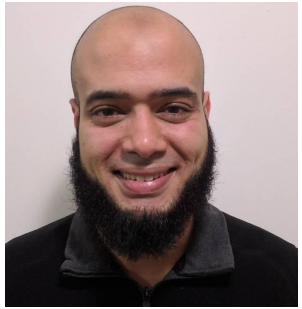


Intro

What? for Whom?

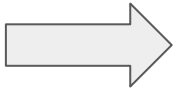
- This course covers very basics C++ Programming fundamentals
  - Data Types, Variables, Read & Write, Loops, Arrays, Functions
  - Minimal syntax will be explained in a slow rate
  - **Many basic** practice examples
- For whom?
  - Mainly students who are 10-15 years (e.g. prep/secondary schools)
  - Guys who are older, but can’t easily understand the main course / fast rate
  - Good entry for Egyptian Olympiad informatics (EOI) and IOI
- After it: Train from my Sheet + Study my major C++ Playlist + book
- Course Language: Speaking in Arabic, but text notes in English

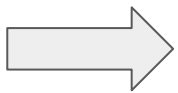
Why Learn Programming?

- Improve problem-solving skills
- Building later real-life applications
- Better understanding for technologies
- It has great earning potential (Highest salaries) / Strong demands
- Much fun for a lot of us
- Participating in programming competitions (e.g. IOI)
  - Build a lot of connections / travel
- You may work in giant companies such as Google and Microsoft

Math? Who could learn? How hard?

- Programming doesn’t need math background/skills, although useful for mind
- ANYONE can learn programmings
  - Kids now abroad learn programming
- Learning programming is like learning a new different human language
  - Say you are learning chinese
  - It is so different from Arabic/English/Germany
  - The Begin is a bit annoying. After sometime, just works well
  - Don’t run away! Don’t tell yourself not for me! I am stupid! And such negative things




Simple Calculator

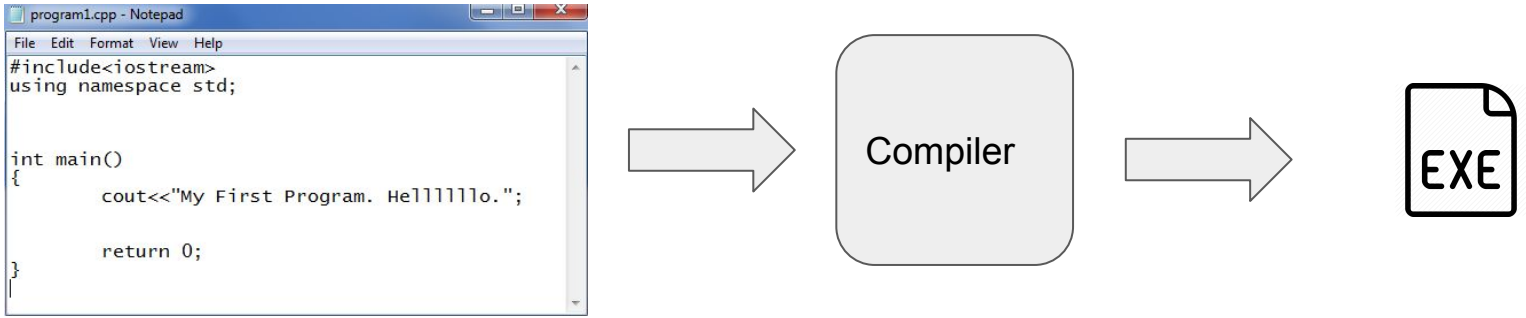
- Program is a set of instructions
  - Read number 1
  - Read operations
  - Read number 2
  - Execute Operation
  - E.g. 3 + 5 = 8
- Processing
  - **CPU** processes operations
- Programming Language
  - A way to talk to the computer (source code) - such as C++, Java, C#, Python

Writing a program

- A comput program is
  - **Sequence** of **commands** given to the computer
    - Read number
    - Write 2 * number + 1
  - They must written in specific format (syntax rules)
  - The **rules** depends on the programming language
- Programming language
  - Set of rules to describe the syntax
- Language Compiler
  - Takes the code we write and convert to executable
    - The CPU knows how to run this executable
  - Compiler gives **errors** if rules are not followed

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



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Let's code!

Your first program

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

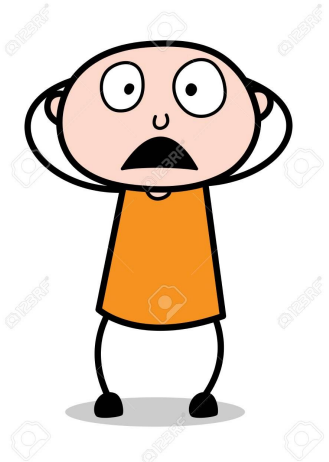
program1.cpp - Notepad

File Edit Format View Help

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


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

        return 0;
}
```



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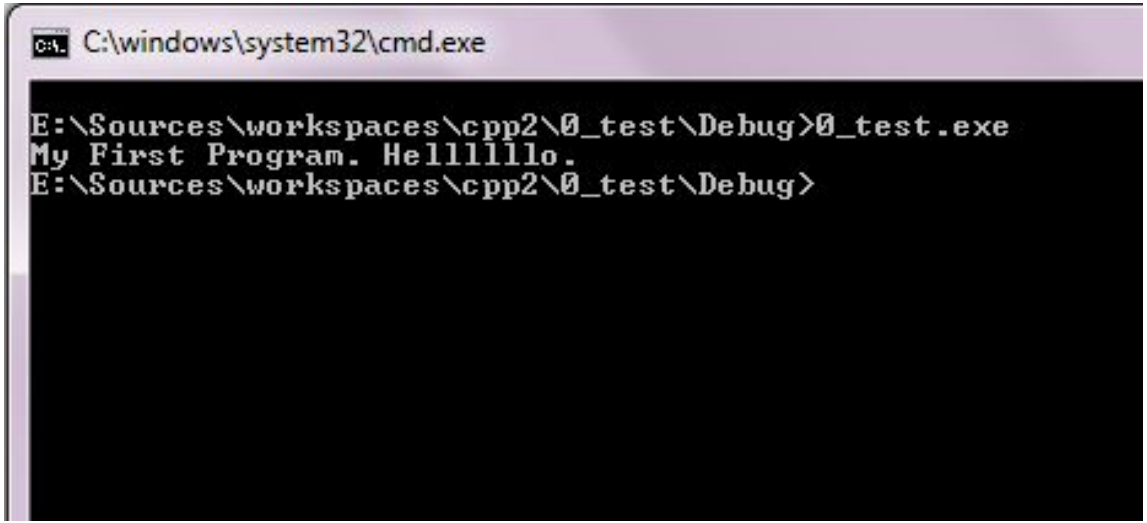
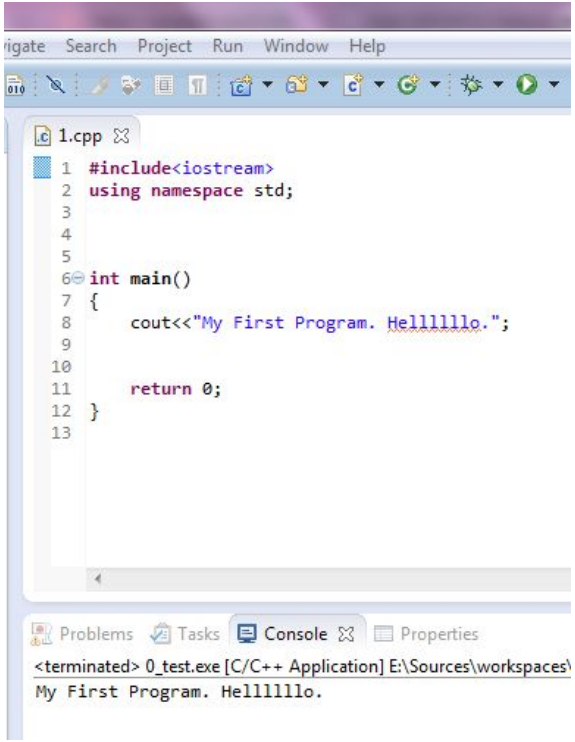
Compile and Run Exe (Console Screen)



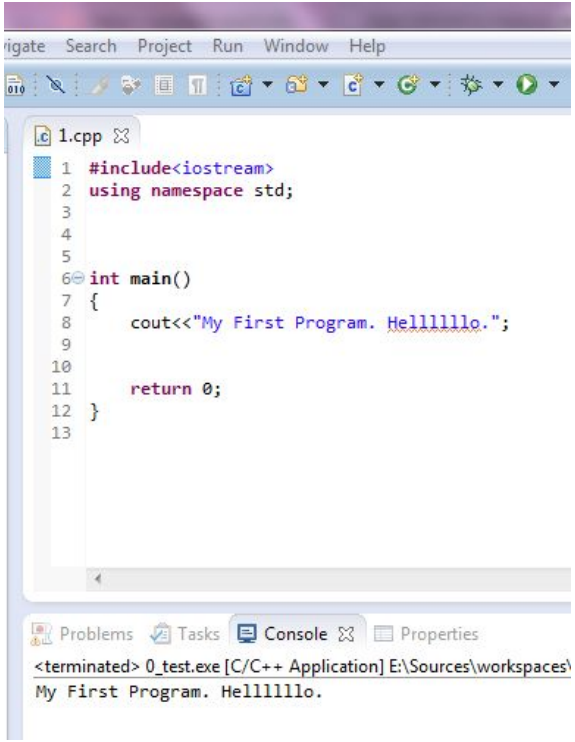
Back to the code

- Line 8: It says
  - C**out**<<
    - This is a **command** to print (cout = Console output)
  - “My First Program. Hellllllllo.”
    - 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 says how to read and write. It defines **cout**
- Other lines: Just write them as they are for now



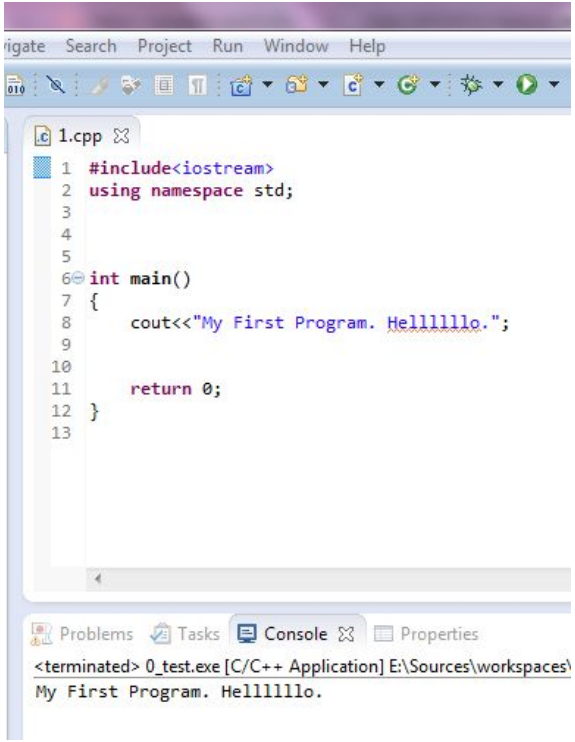
Back to the code: **Optional**

- #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 in some advanced C++



Back to the code: **Optional**

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

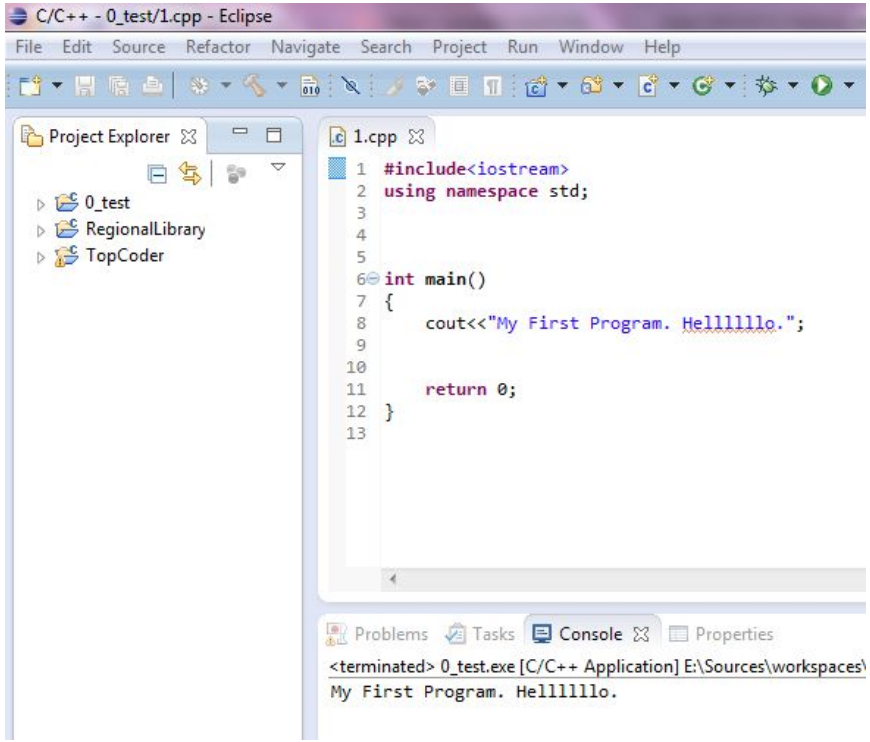


Tools

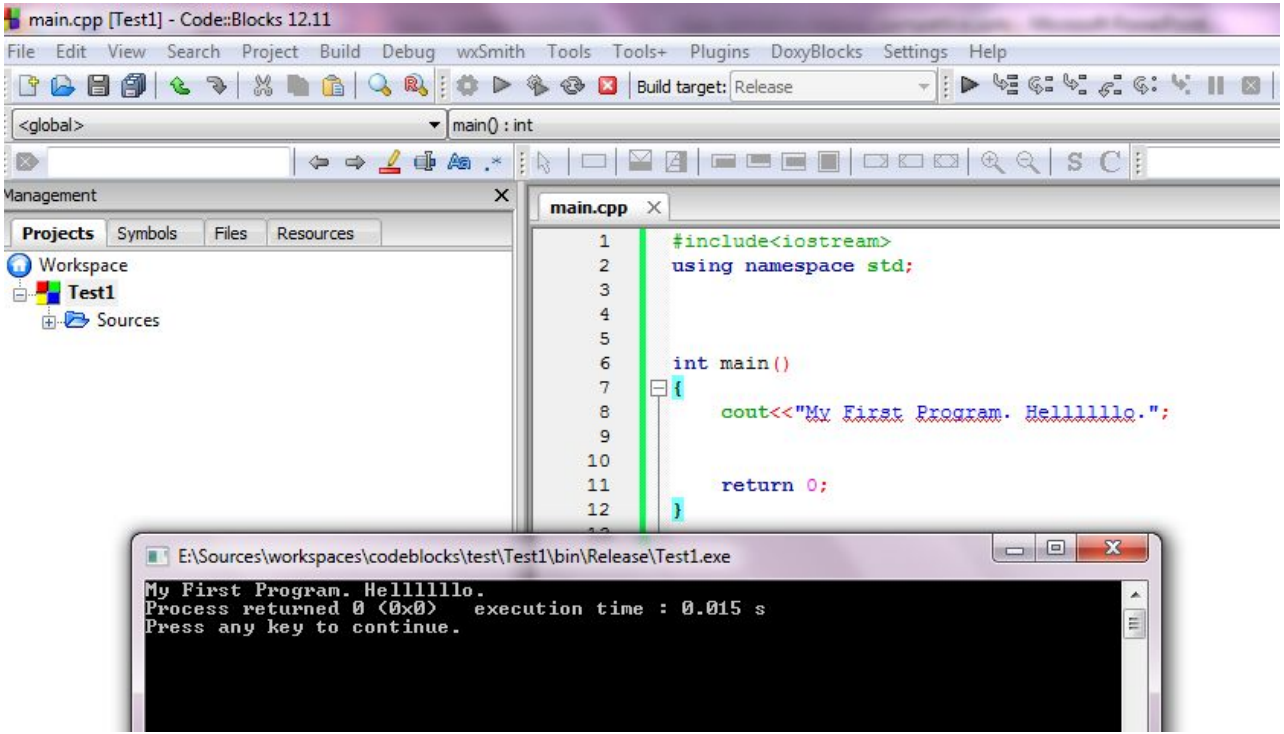
IDE: Integrated development environment

- We could write the code in a **notepad** file,
  - then go to **compiler** to compile and generate **exe** to run
- What about something gathers all in simple way?
- IDE = tools integrate staff for u
- Many ones: CodeBlocks, Eclipse (Next **2 videos**)
  - CodeBlocks is an easier start
  - Eclipse is very popular, but maybe confusing to install

Eclipse IDE


C/C++ - 0_test/1.cpp - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
0_test
RegionalLibrary
TopCoder
1.cpp
#include<iostream>
using namespace std;
int main()
{
cout<<"My First Program. Hellllllo.";
return 0;
}
Problems Tasks Console Properties
<terminated> 0_test.exe [C/C++ Application] E:\Sources\workspaces\
My First Program. Hellllllo.

CodeBlocks IDE



Materials

- C++ Books
  - You don’t need to read now.
  - A First Book C++ or C++ Primer or More suggestions
- Arabic playlists: Link, Link, Assiut table
- Optional
  - Computer Basic Components video

Your next tasks

- Install one of the 2 IDEs (checkout the next 2 [old] videos)
- Compile and run our hello world program
- Change it to print your name!

- All codes will be on github
- Click Code
- Click Row, and download
- You can also download whole repo

تم بحمد الله

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