Lab 1
Environment Setup

In this problem set, you are only required to ***try*** to set up the environment for writing and compiling C programs on your home machine or laptop.

1 Lab Objectives

- Setting up the environment for writing and compiling C programs
- Learning what is a **compiler**
- Learning what is an **IDE** (Integrated Development Environment)

2 Environment Setup

1. Install your own choice of IDE (Codeblocks is recommended for now. For other choices, you will be responsible for handling any problems that may appear)
   - Code::Blocks (Section 5 provides a step-by-step walkthrough for installing Code::Blocks)
   - Eclipse
   - NetBeans
   - Any other IDE if you prefer something else
2. Install a C compiler
   - For windows, you can install MinGW compiler. (see section 5 for more details)

3 Your First C Program "Hello World!"

1. Open up your installed IDE.
2. Write the following lines of code

```
#include <stdio.h>
int main(){
  printf("Hello World!\n");
  return 0;
}
```

3. Save and run

4 Your first self-learning task

You are required to search online for what is a compiler and what is an IDE.
Can you guess what is more important, a compiler or an IDE?
Can you guess whether we can write programs without an IDE or without a compiler?

5 Step-by-step Tutorial for Installing Code::Blocks and MinGW on Windows

This tutorial gives you detailed instructions for setting up a compiler (the MinGW compiler), a tool that converts your C code into machine language instructions (zeros and ones), and Code::Blocks, a free development environment for C and C++.

5.1 Download Code::Blocks

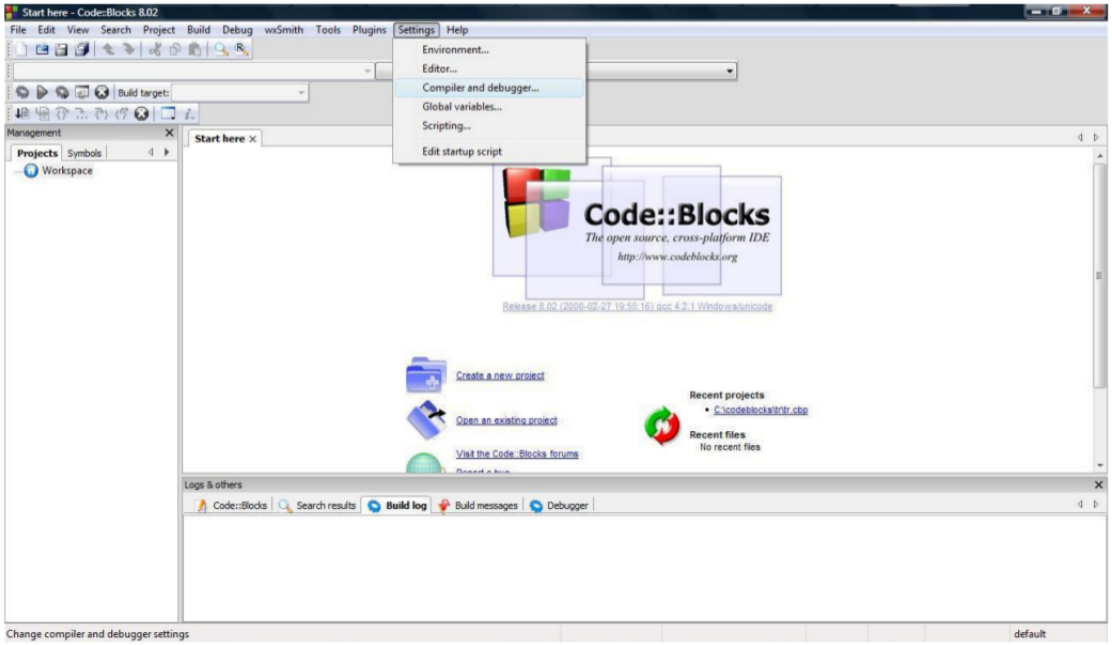
- Go to this website: `http://www.codeblocks.org/downloads`
- Follow the link to "Download the binary release".
- Go to the Windows 2000 / XP / Vista / 7 / 8 / 10 section.
- Look for the file that includes mingw in the name. (The name, as of this writing, was codeblocks-16.01mingw-setup.exe; the 16.01 part may be different).
- Save the file to your desktop or any other prefered location.

5.2 Install Code::Blocks

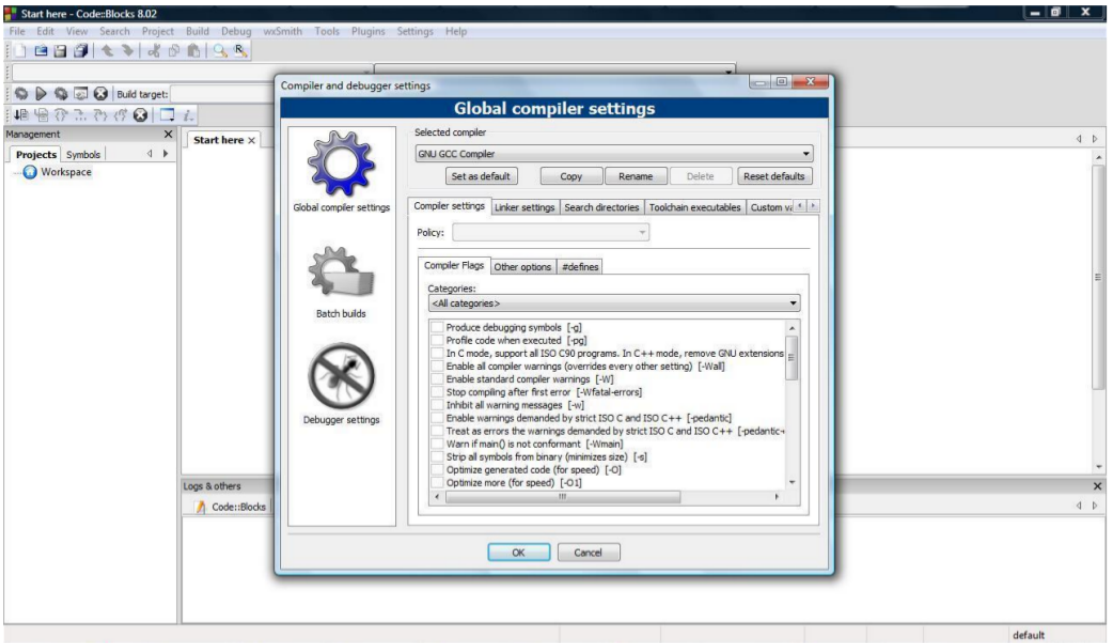
- Double click the installer (the file you downloaded in step 1).
- Hit "Next" several times. Default settings will install Code::Blocks in "C:\Program Files\CodeBlocks", however, you may install it elsewhere if you like.
- Do a Full Installation.
- Launch Code::Blocks.

5.3 Step 3: Linking Code::Blocks to MinGW

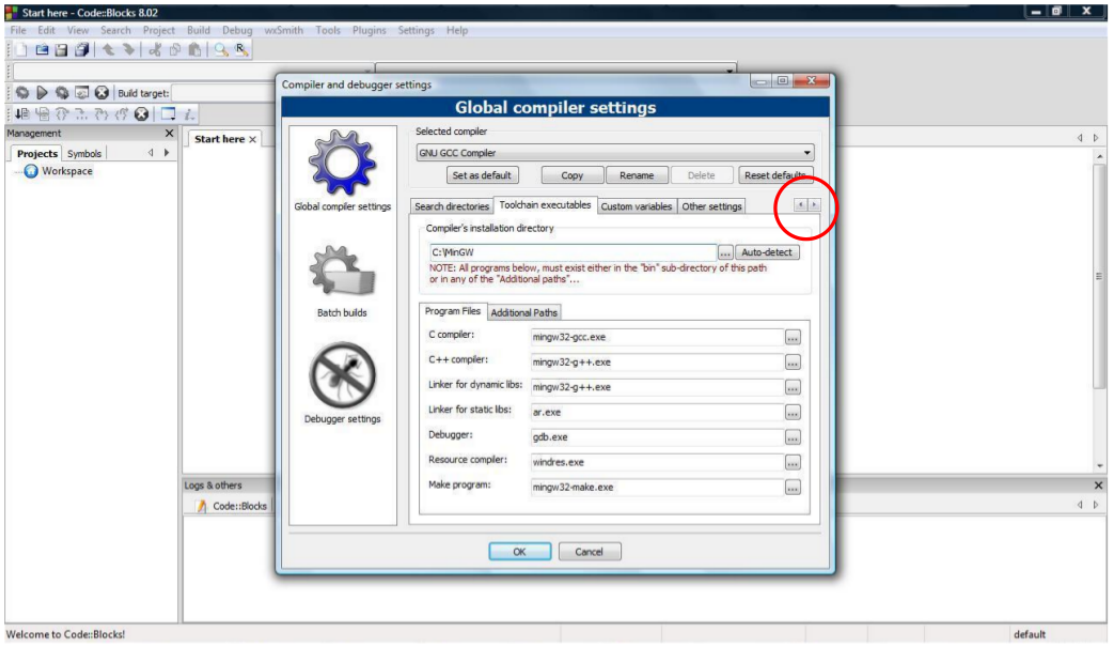
- Go to Settings → Compiler and Debugger...



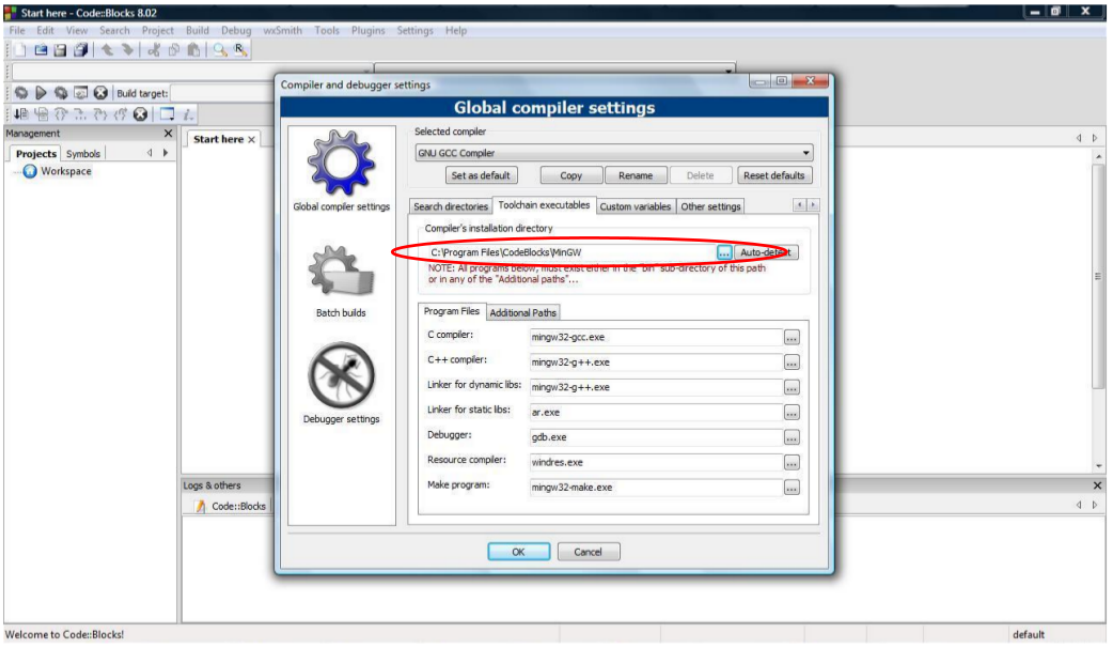
- A new window appears:



- Click on the arrow (>) besides the "Custom variables" (indicated in the following screen shot) until "Toolchain executables" tab appears. Click on that tab.

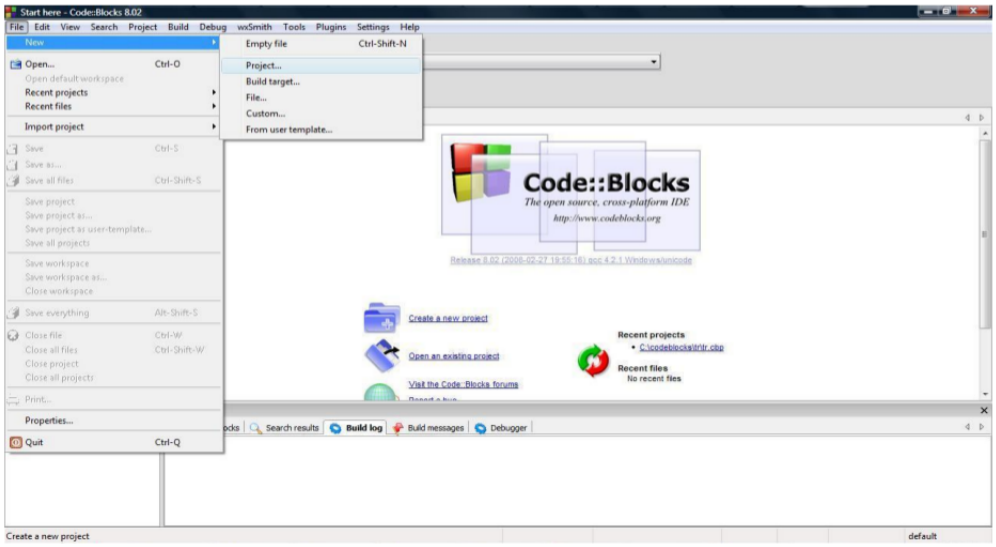


- The "Compiler's installation directory" is set "C:\MinGW". Go to that directory in your file system. If this directory does not exist, then the compiler is set to an invalid location. Also, if the directory path doesnt end with "MinGW", then it is invalid as well. To fix this problem, click on the "..." button besides the "C:\MinGW" textbox. Browse to the installation directory of Code::Blocks (typically C:\Program Files\Code Blocks), inside it you will find a directory named "MinGW", select it.

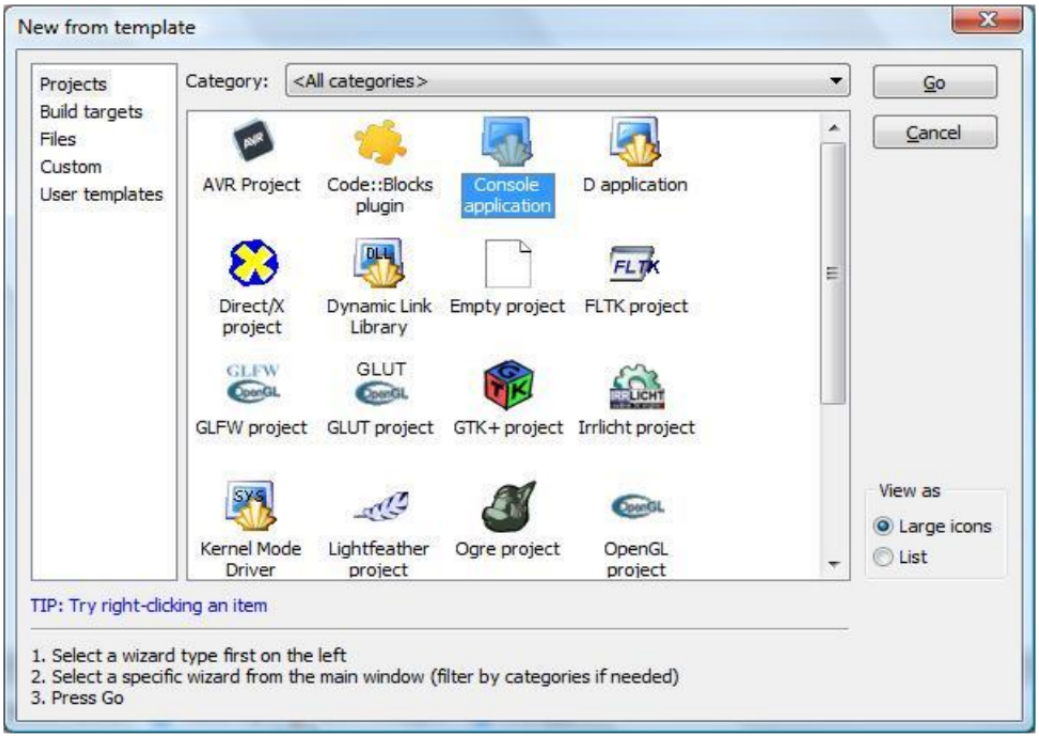


5.4 Creating a new Project

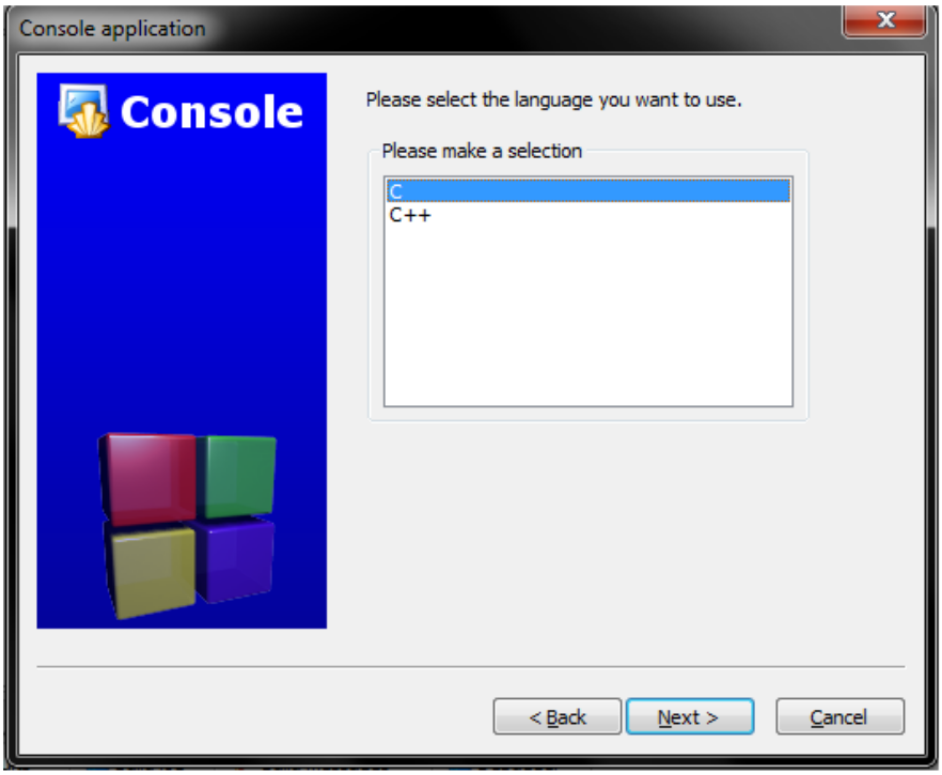
- Go to File → New → Project



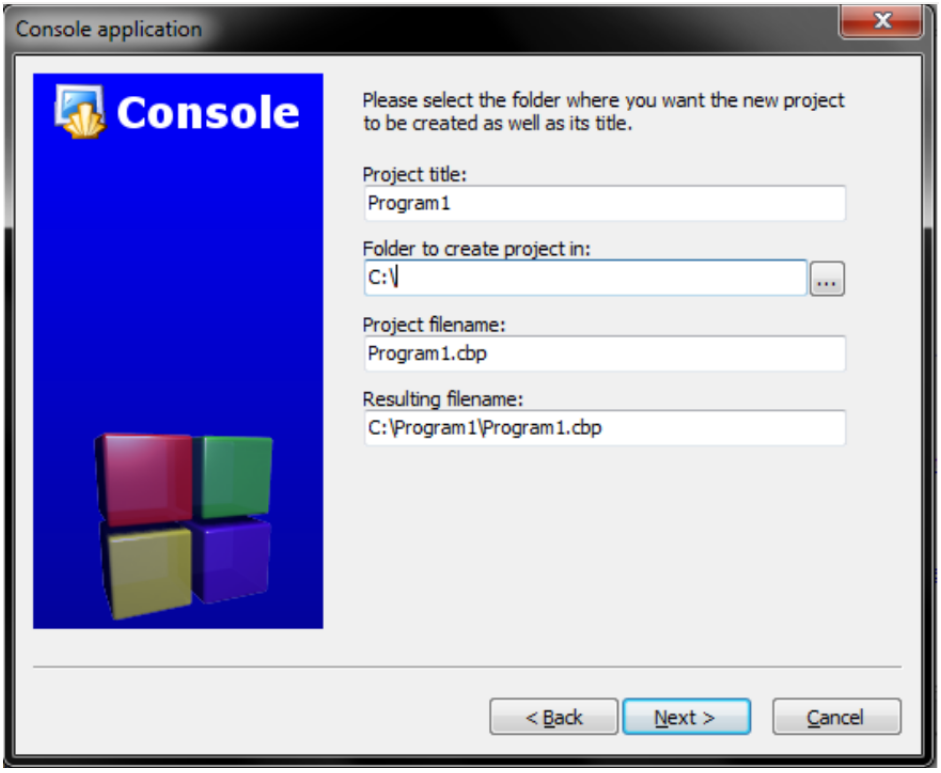
- Select "Console application"



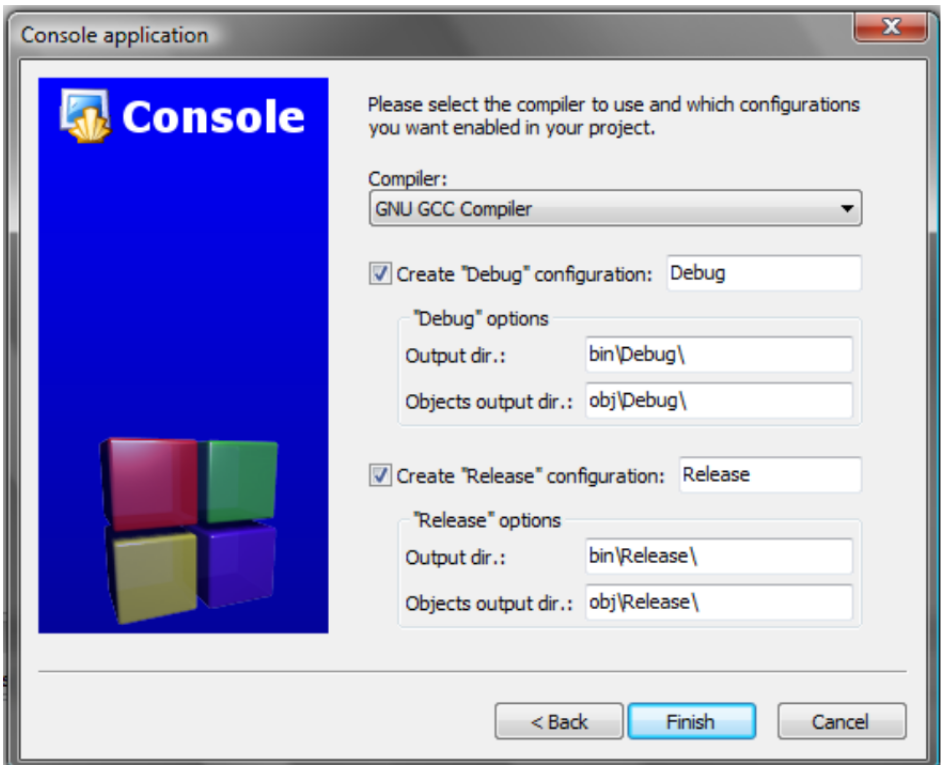
- Then the following window will appear. So choose C.



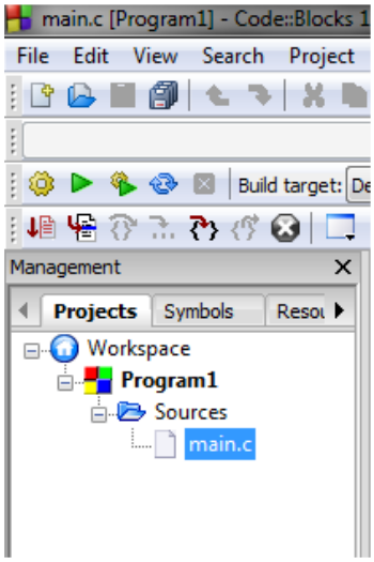
- Write your project name and then click Next.



- Click Finish.



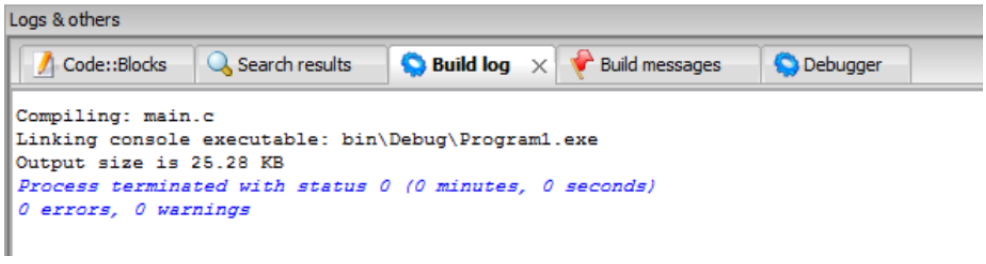
- Then Double click main.c to start writing your first program.



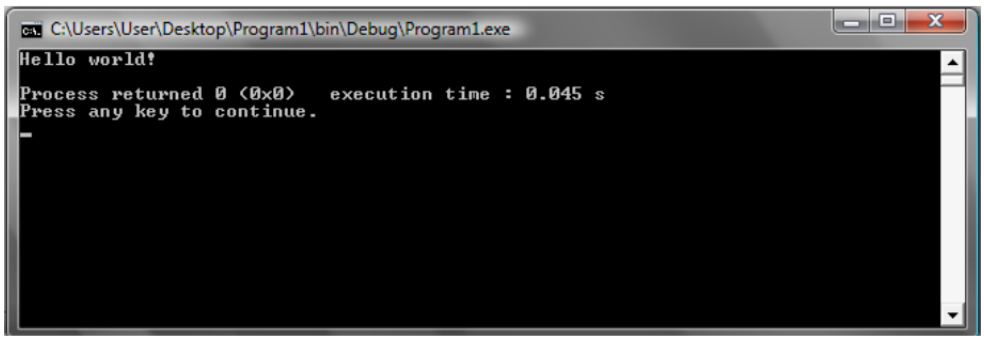
- Then you will find the simple hello world program written like the following image.

```
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main()
5  {
6      printf("Hello world!\n");
7      return 0;
8  }
9
```

- To build the program: From Build Menu choose Build
- If there are no errors you will find as the image below "zero errors, 0 warnings".



- To run the program: From Build Menu choose Run. Then the following window will appear and you will find "Hello world!" printed on the screen.


C:\Users\User\Desktop\Program1\bin\Debug\Program1.exe
Hello world!
Process returned 0 (0x0)   execution time : 0.045 s
Press any key to continue.

6 Notes

6.1 Environment Setup

- You are only required to try to do setup the environment. Any trouble you face will be solved in the lab isA.
- You are encouraged to ask any questions on Piazza, or in person.
- Before you download and install any IDE, you *may* find two versions to choose from:
  - x86 or 32-bit
  - x64 or 64-bit

  To know which one you should download/install:
  In windows, right click on "My Computer", and choose properties. A window will open and you will find an entry with the title "System type", it will be either 32-bit or 64-bit. So, download the same version as your system type.

Good Luck :)