Install CPP Compiler and IDE

Contents

Time required: 60 minutes

Video walkthrough: Install C++

Video walkthrough: Hello World in C++

Integrated Development Environment (IDE)

A good IDE (Integrated Development Environment) can help you create good code and can speed up the software engineering process. There are many good IDE's available. Visual Studio Code will be used for most class demonstrations.

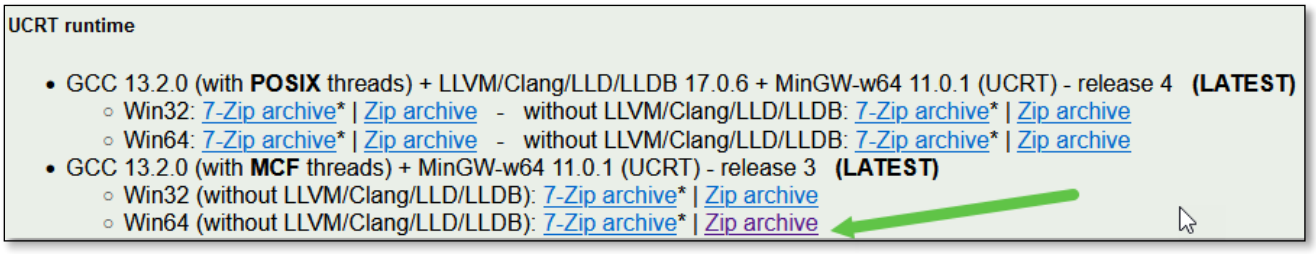
Install MinGW-x64 Compiler for Windows

NOTE: Kali Linux and most distributions of Linux already have a C++ compiler installed.

We will install Mingw-w64, which is a 64-bit C++ compiler for Windows. If you have a Mac, there is already a C++ compiler built-in along with Xcode.

1. Go to http://www.winlibs.com
2. Go down the page to **Release versions**.

3. Choose UCRT runtime GCC with MCF threads. We want the one to the right, without LLVM/Clang. (The exact version number will change over time.)



4. Unzip the file you downloaded.
5. Go into the extracted folder → Keep going until you find the **mingw64** folder.
6. Copy this folder to your C: drive. **C:\mingw64**

Add the MinGW-x64 Compiler to Your Path

Add the path to your Mingw-w64 **bin** folder to the Windows **PATH** environment variable by using the following steps:

1. Click the **Start** button → Type in **Environment Variables**.
2. Click **Edit the system environment variables**.
3. In the **System variables** window → Choose the **Path** variable → select **Edit**.
4. Select **New** →add the Mingw64 destination folder path:
   c:\mingw64\bin
5. Select **OK** to save the updated Path.
6. Restart your computer.

Check your MinGW installation

To check that your Mingw-w64 tools are correctly installed and available, open a **new** Command Prompt and type:

```
g++ --version
```

Example run:

```
C:\Users\willi>g++ --version
g++ (MinGW-W64 x86_64-ucrt-posix-seh, built by Brecht Sanders) 12.2.0
Copyright (C) 2022 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

Your output should be similar, you may have a different version.

If you don't see the expected output or **g++** is not a recognized command, make sure your PATH entry matches the Mingw-w64 binary location where the compiler tools are located.

Clang C++ Compiler for Mac

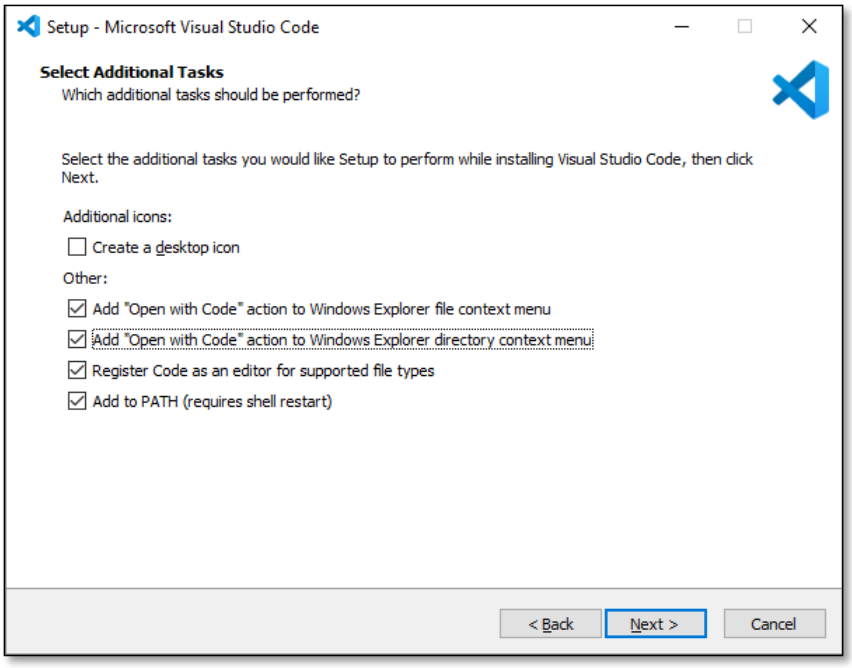
https://code.visualstudio.com/docs/cpp/config-clang-mac

Install Visual Studio Code

Microsoft Visual Studio Code is an opensource editor sponsored by Microsoft. Microsoft also owns GitHub.

Visual Studio Code integrates with GitHub Desktop. There is extensive information on how to get started with Visual Studio Code on the Visual Studio Code website.

1. Go to https://code.visualstudio.com/download.
2. Download and install the **System Installer 64-bit** version of Visual Studio Code for your operating system.
3. During the installation: **Select Additional Tasks**, select the following items. You can create a desktop icon if you wish.

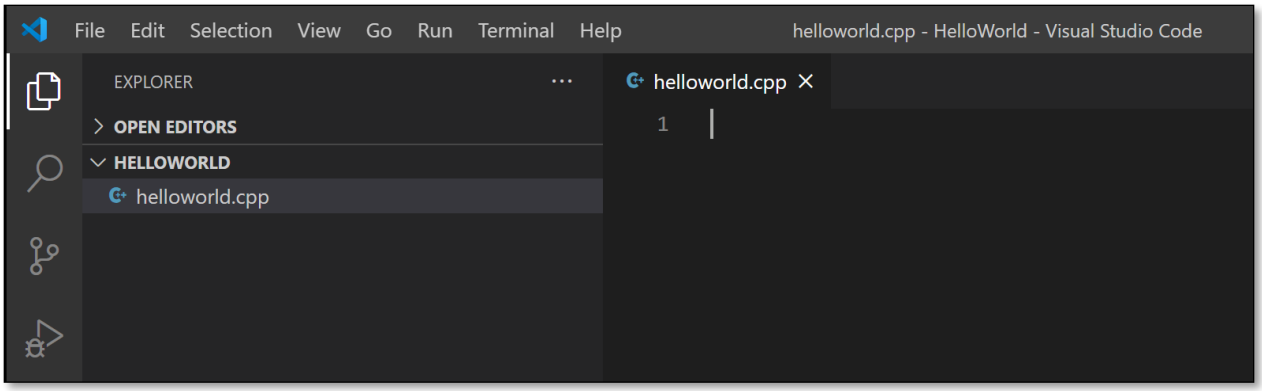


4. Launch Visual Studio Code.
5. Go to the **View** menu → **Extensions** command.
6. Search for **C/C++ Extension Pack** by Microsoft. **Install it.**

Tutorial 1: Hello World for C++

Hello World is the traditional program to determine if your development environment is ready to roll.

1. Create a folder for your C++ code.
2. Right Click the folder → Choose **Open with Code**.
3. In Visual Studio Code → Right Click under the folder you created → Name the file **helloworld.cpp**

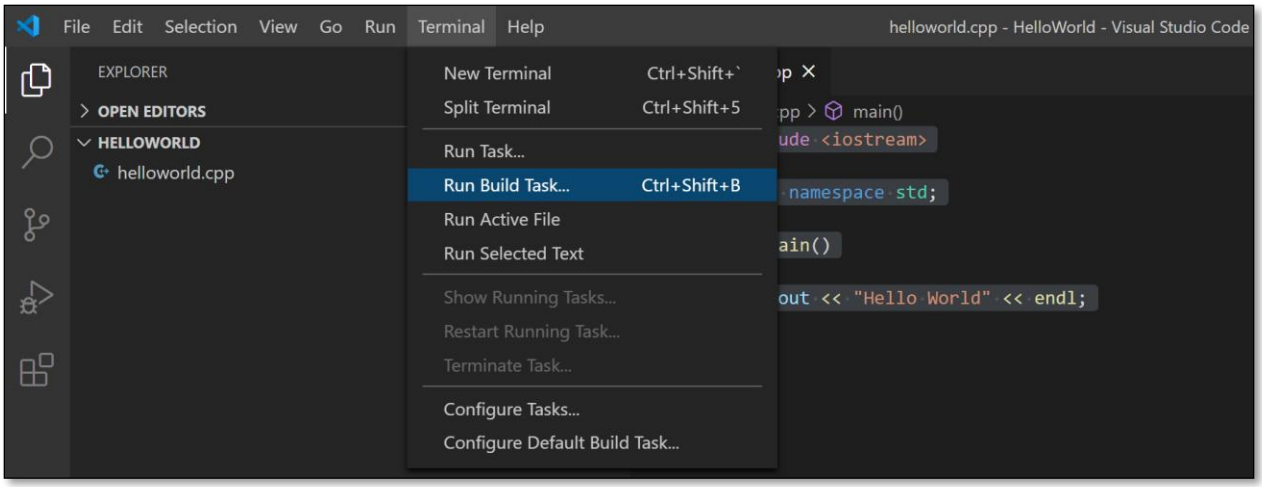


4. Type in the following code exactly as shown.

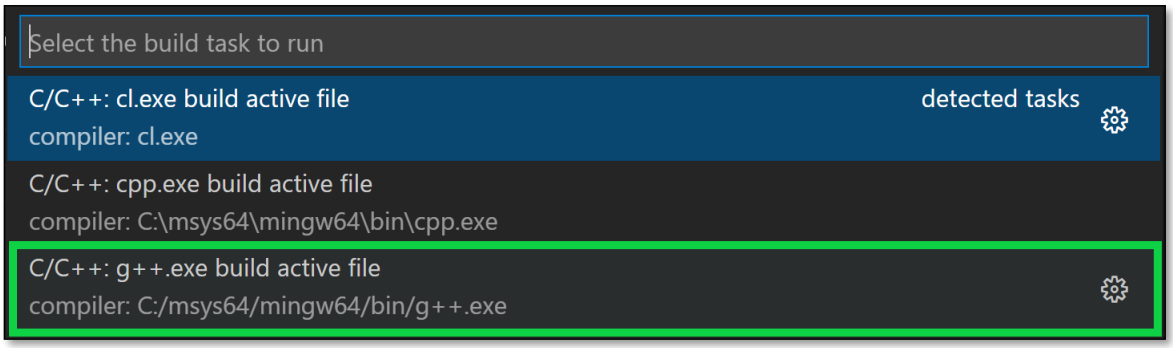
```cpp
/**
 * Filename: hello_world.cpp
 * Written by:
 * Written on:
 * Revised:
 * Traditional Hello World program in C++
 */

// Include iostream for the cout function
#include <iostream>

// Entry point for all C++ programs
int main()
{
    // std:: is the standard library
    // Use cout to print text to the console
    // endl adds a new line
    std::cout << "Hello, World!" << std::endl;
    std::cout << "We are on the C++ road to programming excellence!" << std::endl;
    // This line is at the end of all C++ programs
    // It returns 0 to the operation system, meaning the program worked
    return 0;
}
```

5. Press **CTRL + S** to save the file.

6. Build the program. Select the **Terminal** menu→ **Run Build Task** command **(Ctrl+Shift+B)**.



7. This will display a dropdown with various compiler task options. You are using the GCC toolset MinGW, you would choose **C/C++: g++.exe build active file**



8. This will compile **helloworld.cpp** and create an executable file called **helloworld.exe** which will appear in the File Explorer.
9. Go to the **Terminal** menu → **New Terminal** → Type .**helloworld** → Press **Enter**.

Tada! You compiled and executed your first C++ program!

Optional Tutorial: https://code.visualstudio.com/docs/cpp/config-mingw

Online C++ Compilers

1. Replit
2. https://wandbox.org/
3. Compiler Explorer

Other IDE's

At the beginning of your programming journey, it is a good idea to use a simple IDE like Geany or Visual Studio Code. You can concentrate more on the code than on learning the interface.

As you grow and gain more experience, you may want to experiment with more complex programming environments.

- Geany is a simple cross platform open source IDE for many languages. https://www.geany.org/
- Code Lite is a low overhead C++ IDE. https://codelite.org
- CodeBlocks is a C++ IDE that includes a compiler. https://www.codeblocks.org/downloads/binaries

Assignment Submission

- Insert a screenshot showing a successful program run.
- Attach the .cpp file
- Submit in Blackboard.