How to set up and use GCC compiler on Visual Studio Code (Windows Only)

```c
#include<stdio.h>

int main(void)
{
    printf("Hello World!");
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE

Filter (e.g. text, !exclude, \escape)

```
Loaded '/usr/lib/system/libsystem_symptoms.dylib'. Symbols loaded.
Loaded '/usr/lib/system/libsystem_trace.dylib'. Symbols loaded.
Loaded '/usr/lib/system/libunwind.dylib'. Symbols loaded.
Loaded '/usr/lib/system/libxpc.dylib'. Symbols loaded.
Loaded '/usr/lib/libobjc.A.dylib'. Symbols loaded.
Loaded '/usr/lib/libc++abi.dylib'. Symbols loaded.
Loaded '/usr/lib/liboah.dylib'. Symbols loaded.
Loaded '/usr/lib/libc++.1.dylib'. Symbols loaded.
=thread-selected,id="1"
Hello World!
The program '/Users/bjethwani/CLionProjects/CS1_Sandbox/setup' has exited with code 0 (0x00000000).
```

Tutorial Introduction/Overview

Goals/Objectives

- Show the steps to download a GCC compiler on VS Code.

- Show how to use the GCC compiler on VS Code.

- Show additional tools that come with the installation

Requirements/Tools Needed

- Windows 8+ Device required

- VS Code Installed

- Google Chrome/Browser to install resources

Table of Contents

GCC History

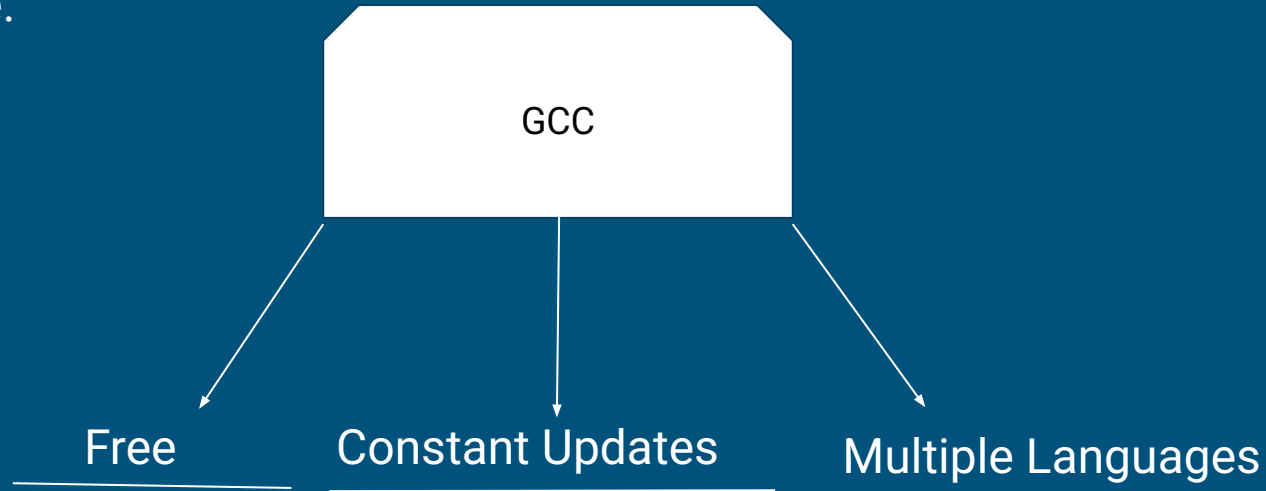- GCC stands for the GNU Compiler Collection.
- GNU was the first free compiler created by non-profit open source methods.

1984

1987

1997

2001-Present

GNU project is started

First beta of GCC is released

EGCS project is initiated

GCC receives constant updates

Richard Stallman starts the project to create the first ever free C compiler.

GCC is finished for C and is extended to compile C++ as well later in the year.

With GCC's success and wide use, a project is initiated to improve it's development.

As new languages and frameworks release, GCC is updated with them frequently.

Why should you download the GCC compiler?

1. Without a compiler the code you type on a file cannot be processed.
2. GCC offers an easy to use debugger called GDB which allows you to debug your code.

GCC

Free   Constant Updates   Multiple Languages

Installing C/C++ extension

1.

On Visual Studio Code Navigate to Extensions

2. In the search bar type and select "C/C++" and click install

3. After installing your extension page should look like this

3

Installing the GCC Compiler

Note:
We will be downloading the GCC Compiler from MSYS2

1. Download the link below

https://github.com/msys2/msys2-installer/releases/download/2025-02-21/msys2-x86_64-20250221.exe

Note: This link will download the MinGW, which is a toolchain that contains GCC and various other tools/software. For more information visit this link:

https://www.msys2.org/

2. Run the installer and click next till finished

Accept default settings unless you want manual settings
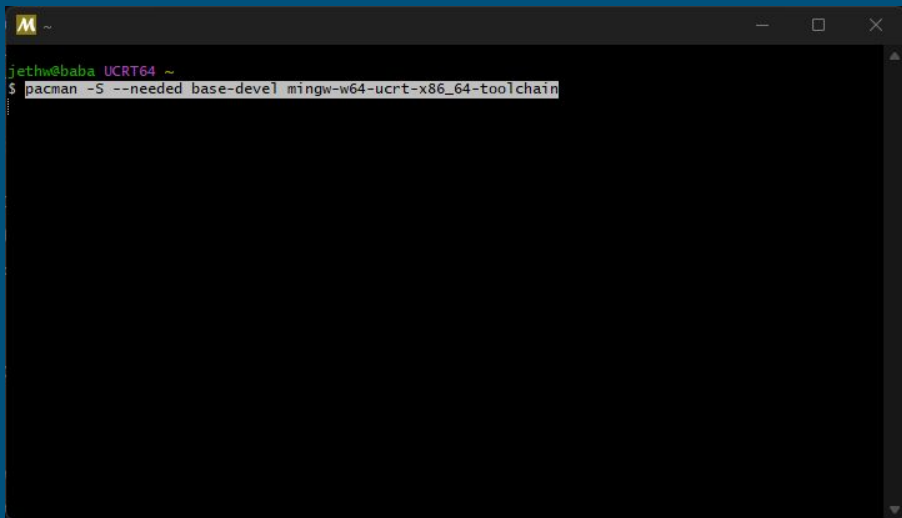
3. Click CMD and execute the following command

Setting up GCC compiler
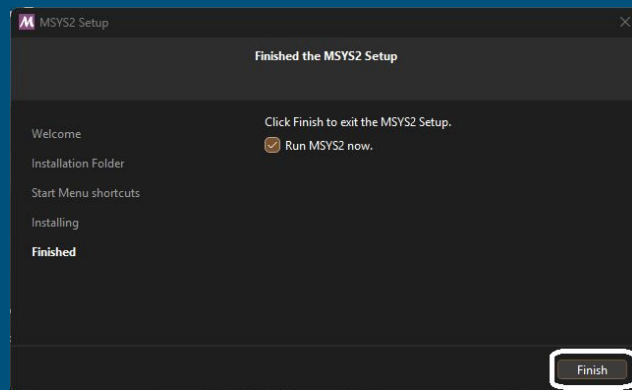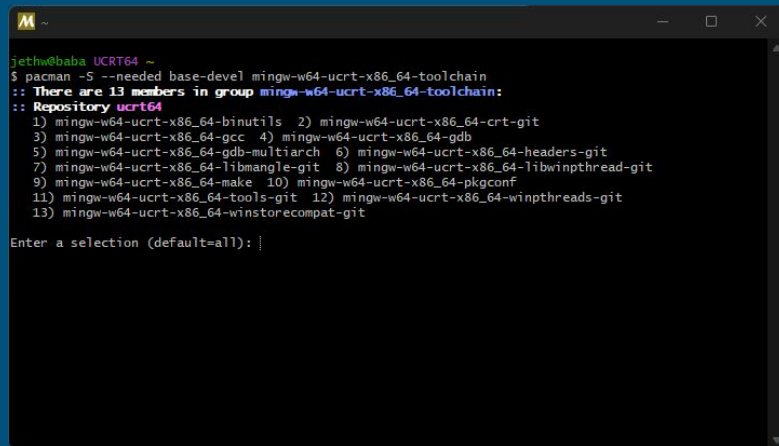
1. Copy and paste the following command:
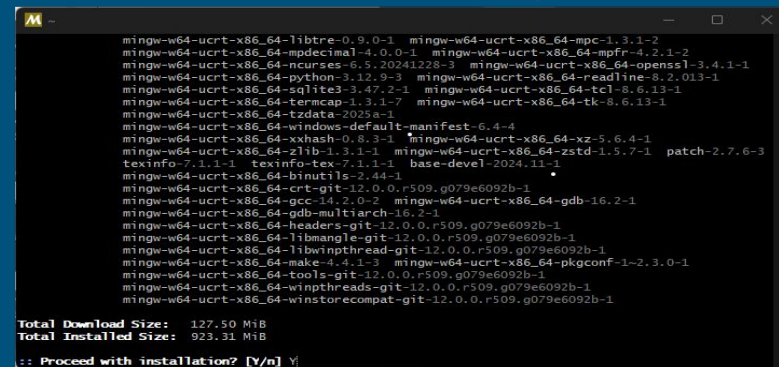pacman -S --needed base-devel mingw-w64-ucrt-x86_64-toolchain

2. Hit enter to download all default tools

3. Type Y to proceed with installation

Finalizing GCC Installation Part 1

Now that all necessary components have been downloaded we need to make our system can find and recognize our compiler. We will do this by completing the first part:

Note: Changing user path changes for user rather than system. Changes won't apply for other users.

1. In your windows search, type: "Edit the system environment variables"

2. Click on the selection and then click on the option environment variables.

3. Find the variable Path under user and click edit.
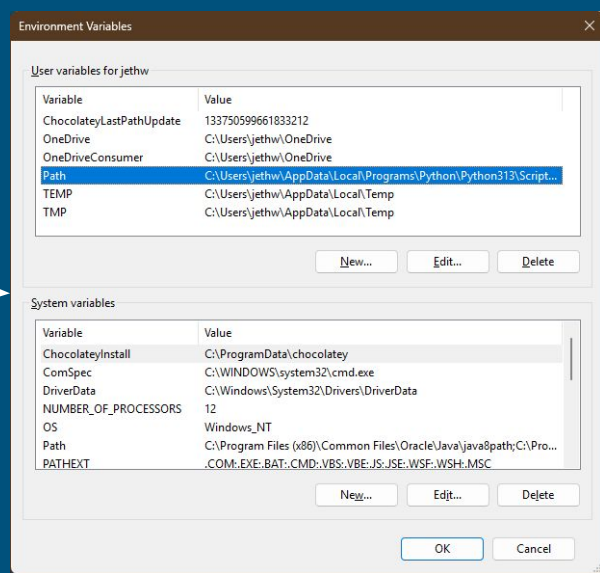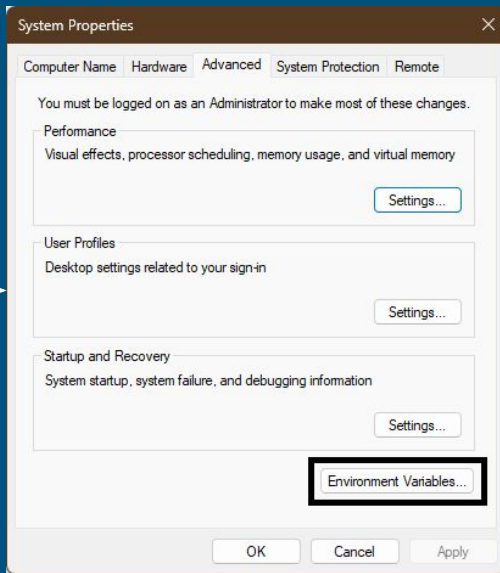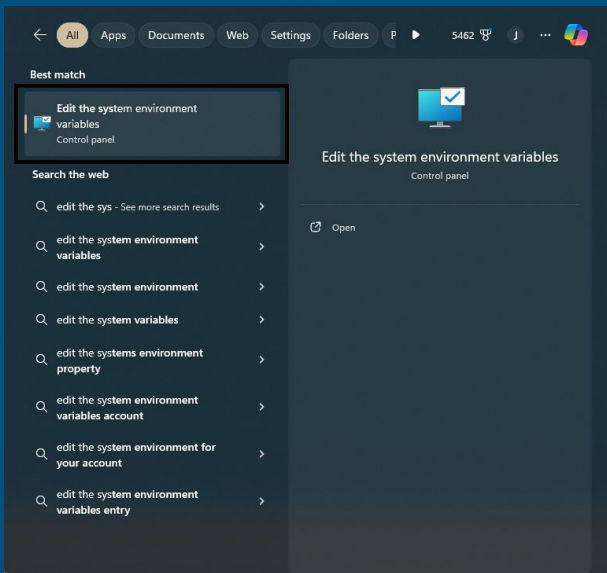
Finalizing GCC Installation Part 2

We will configure our $PATH variable to detect the bin folder of our MinGW download which contains our GCC Compiler. To do this we have to edit our PATH environment variable.

1. Click New and type the following path if you accepted all default settings on installation: C:\mysys64\ucrt64\bin. Otherwise, type in the relative path of the directory you saved it too.

2. Click OK until you exit the control panel. Now to make sure that the tools are downloaded correctly and your system can detect them, run the following commands in your command prompt:

Edit environment variable

```
C:\Users\jethw\AppData\Local\Programs\Python\Python313\Scripts\
C:\Users\jethw\AppData\Local\Programs\Python\Python313\
%USERPROFILE%\AppData\Local\Microsoft\WindowsApps
C:\MinGW\bin
C:\Users\jethw\AppData\Roaming\npm
C:\Users\jethw\AppData\Local\Microsoft\WinGet\Links
C:\Users\jethw\AppData\Local\Programs\Microsoft VS Code\bin
C:\flutter\bin
C:\msys64\ucrt64\bin
```

New
Edit
Browse...
Delete
Move Up
Move Down
Edit text...
OK   Cancel

Windows PowerShell

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\jethw> gcc --version
gcc.exe (Rev2, Built by MSYS2 project) 14.2.0
Copyright (C) 2024 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.

PS C:\Users\jethw> gdb --version
GNU gdb (GDB) 15.2
Copyright (C) 2024 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.
PS C:\Users\jethw> |
```
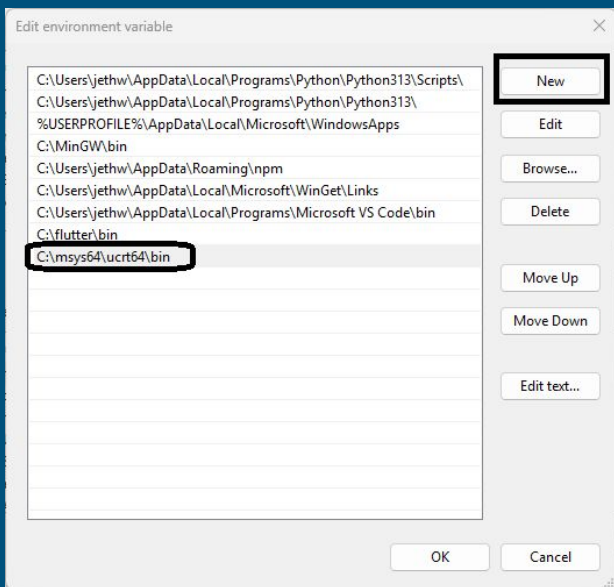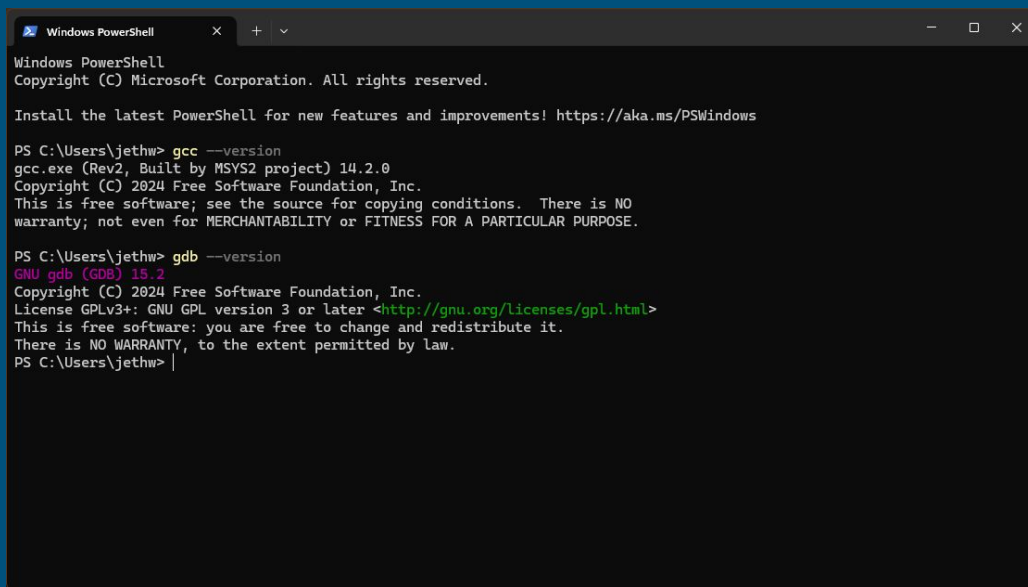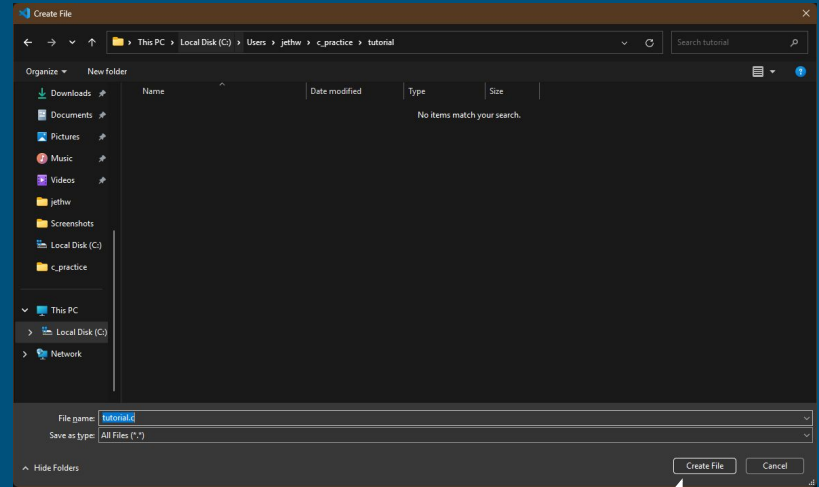
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Using GCC with Visual Studio Code Part 1
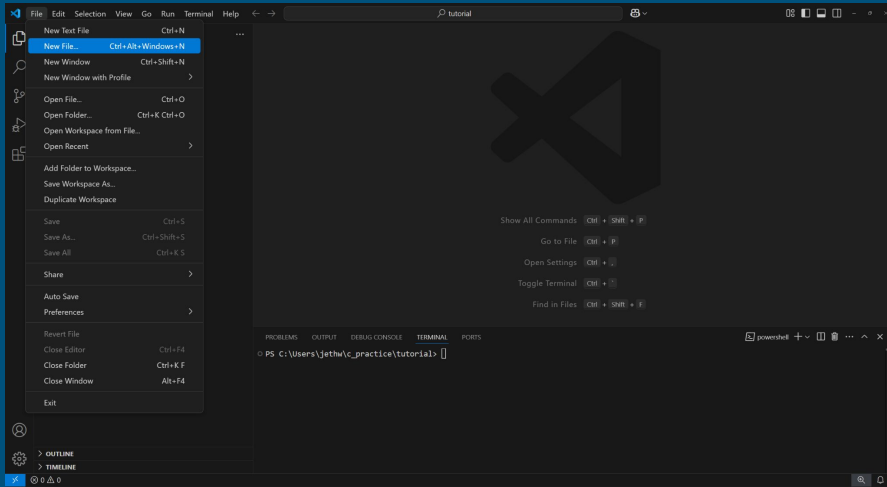
Now that we have verified our installation of GCC on our system, we can now use it on our desired platform VS Code. Let's create a C file!

1. In VS Code click file and click the new file option and name it "insert name here".c

Note: Do not include the quotation marks around your chosen name

2. Now choose a location for where you want to save the file and click create file.

Using GCC with Visual Studio Code Part 2

Now we will actually write some sample code on the new file which you created. Make sure to type the code letter for letter!
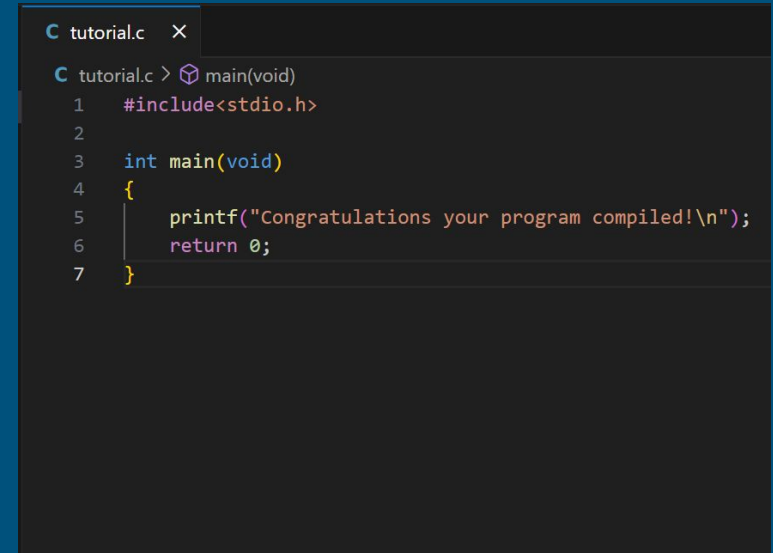
1. After creating the file, you should be brought to a screen which has the file open in the VS code editor.

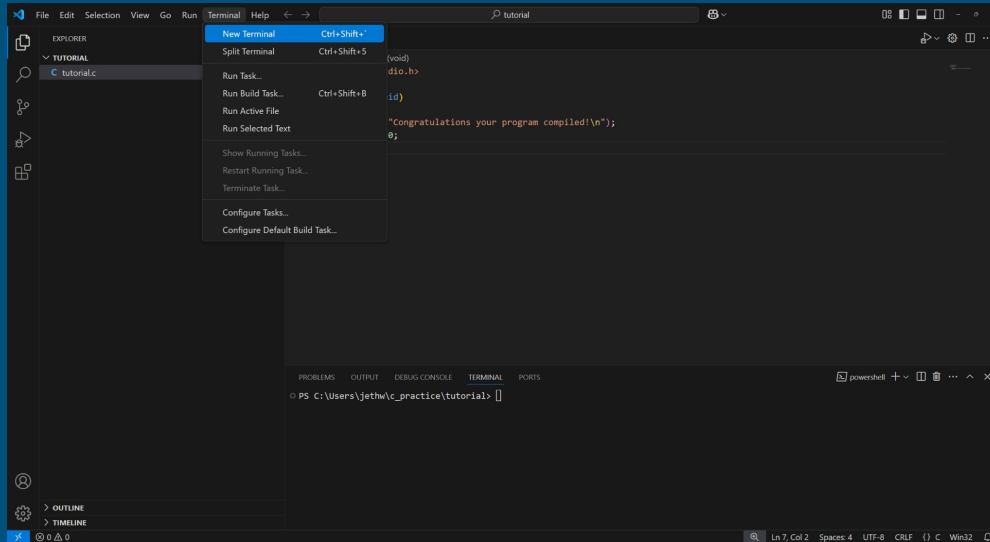**2.** Now type the following program code in the file.

```
C tutorial.c > main(void)
1    #include<stdio.h>
2
3    int main(void)
4    {
5        printf("Congratulations your program compiled!\n");
6        return 0;
7    }
```
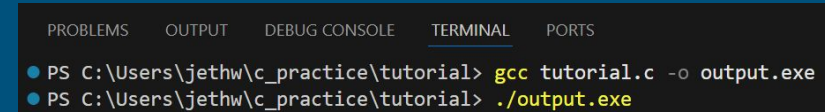
Using GCC with Visual Studio Code Part 3

At last, we will now compile our C file which has executable code on it!

1. Select the terminal tab on the bottom of your screen. If it's not there by default then click terminal on the top of your screen, and click new terminal.

2. Now type the following commands in the terminal to compile and execute your file.

Note: After gcc make sure to put your "file name".c and not tutorial.c if you haven't named your file that.

Finally, your screen should look like this!

Note: Your program output is placed right under the terminal commands.

Glossary

Compiler: Software which translates a programming language/code into machine code understandable by the computer.

CMD(Command Prompt): Interface/program which allows you to interact with the operating system using specific commands.

Debugger: Software tool which allows programmers to track and see the state of their program and it's variables.

$PATH: A variable in your system which contains the paths for different applications "bins". These paths tell the operating system where to execute the application files.

DIRECTORY: A folder on your system located in a specific location in your operating system. Used for storing files, both for applications and personal use.

BIN: Directory which contains the files to be executed by the operating system so that the application can be run.

Conclusion

In this tutorial you were able to do the following:

- Download GCC and set it up with VS code.
- Create a C file in VS code for compilation.
- Write a C program and compile it successfully.

Additional resources:

- https://www.gnu.org/home.en.html
- https://gcc.gnu.org/
- https://github.com/gcc-mirror/gcc