C++ Computer Science

by

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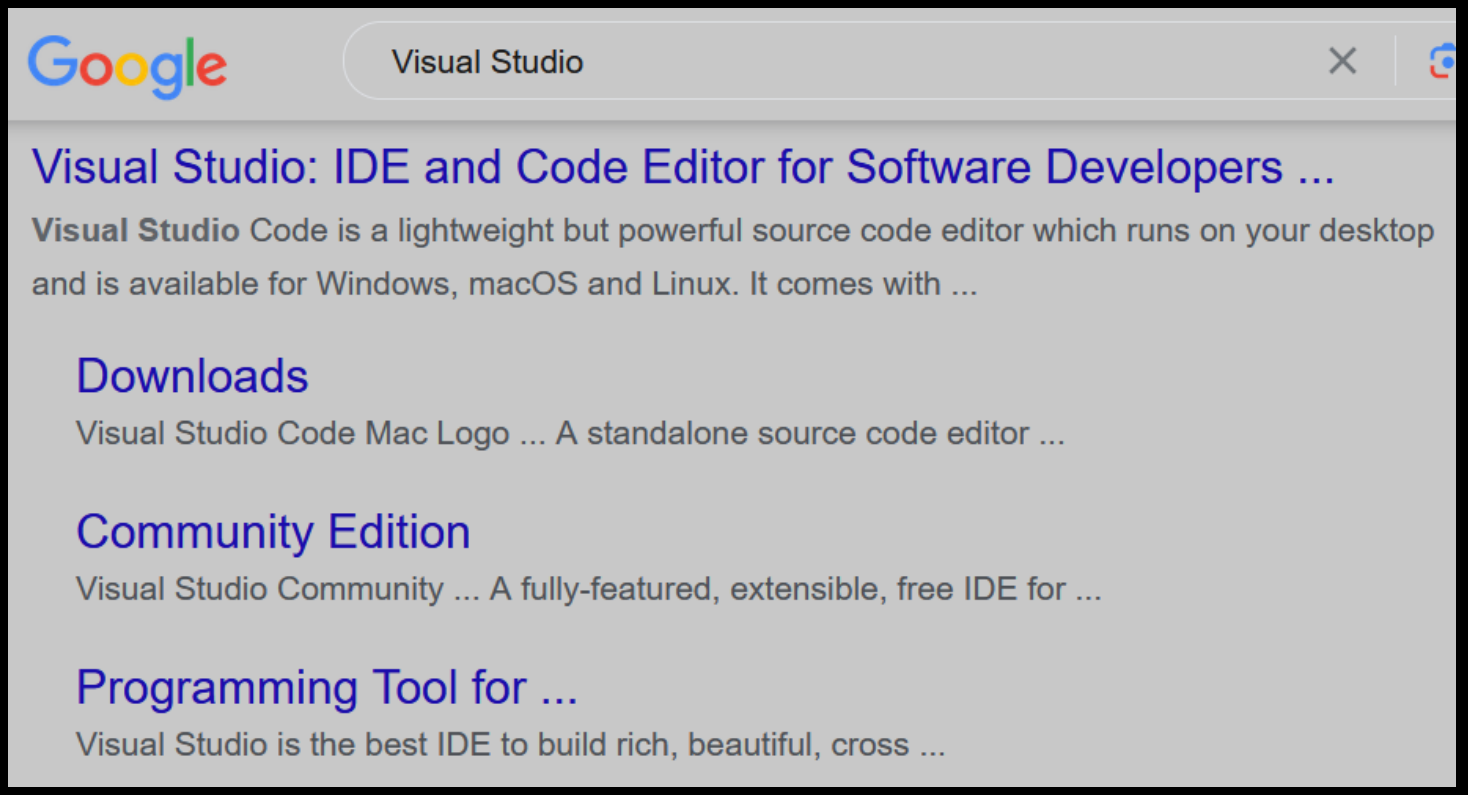
Christopher Topalian

Dedicated to God the Father

Download Visual Studio - Search Google



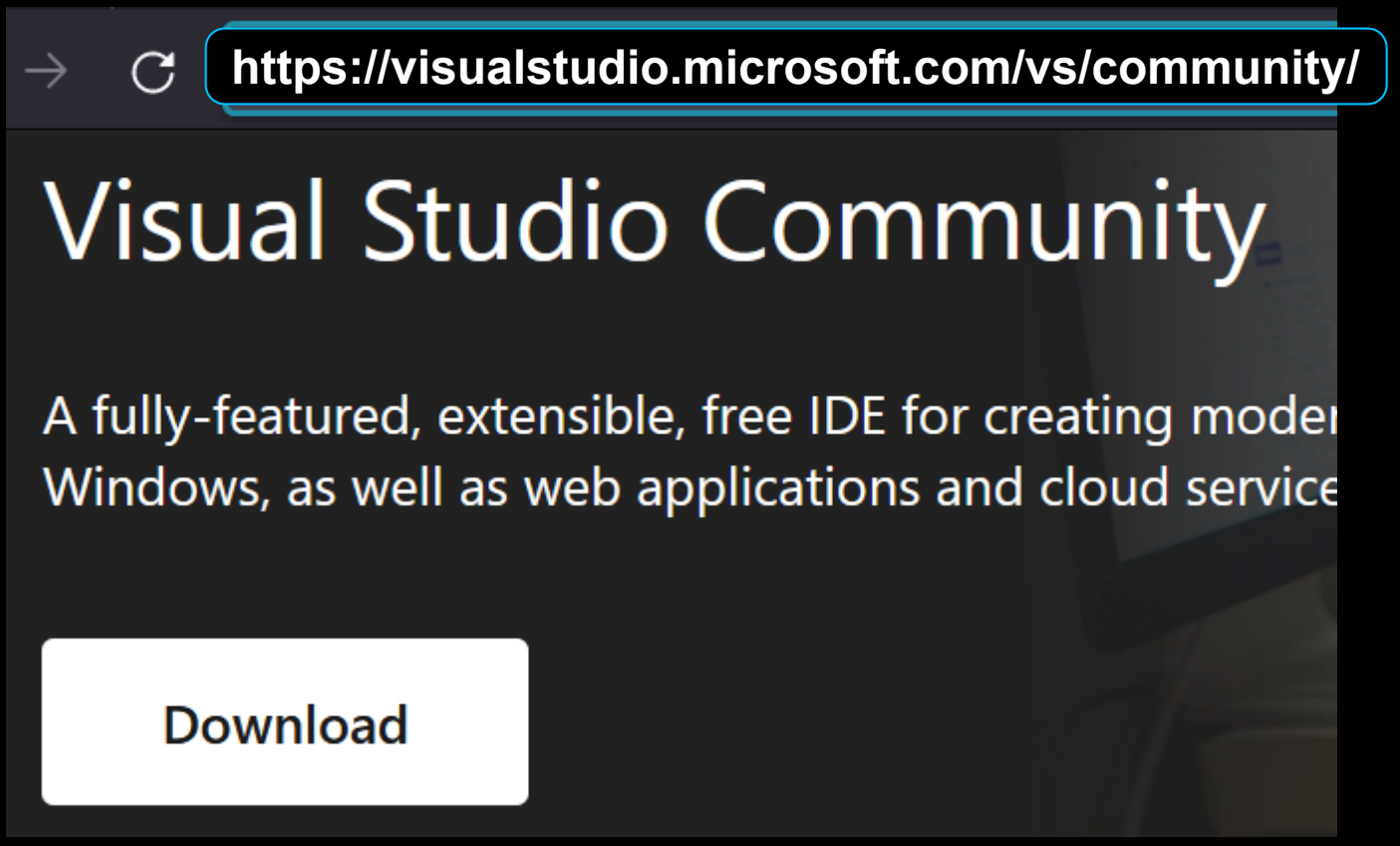
We Go To: google.com

We Search for: Visual Studio

We Left Click on: Downloads

Or we can go directly
to the Visual Studio website
as shown on the next page.

Download Visual Studio - Directly from Website



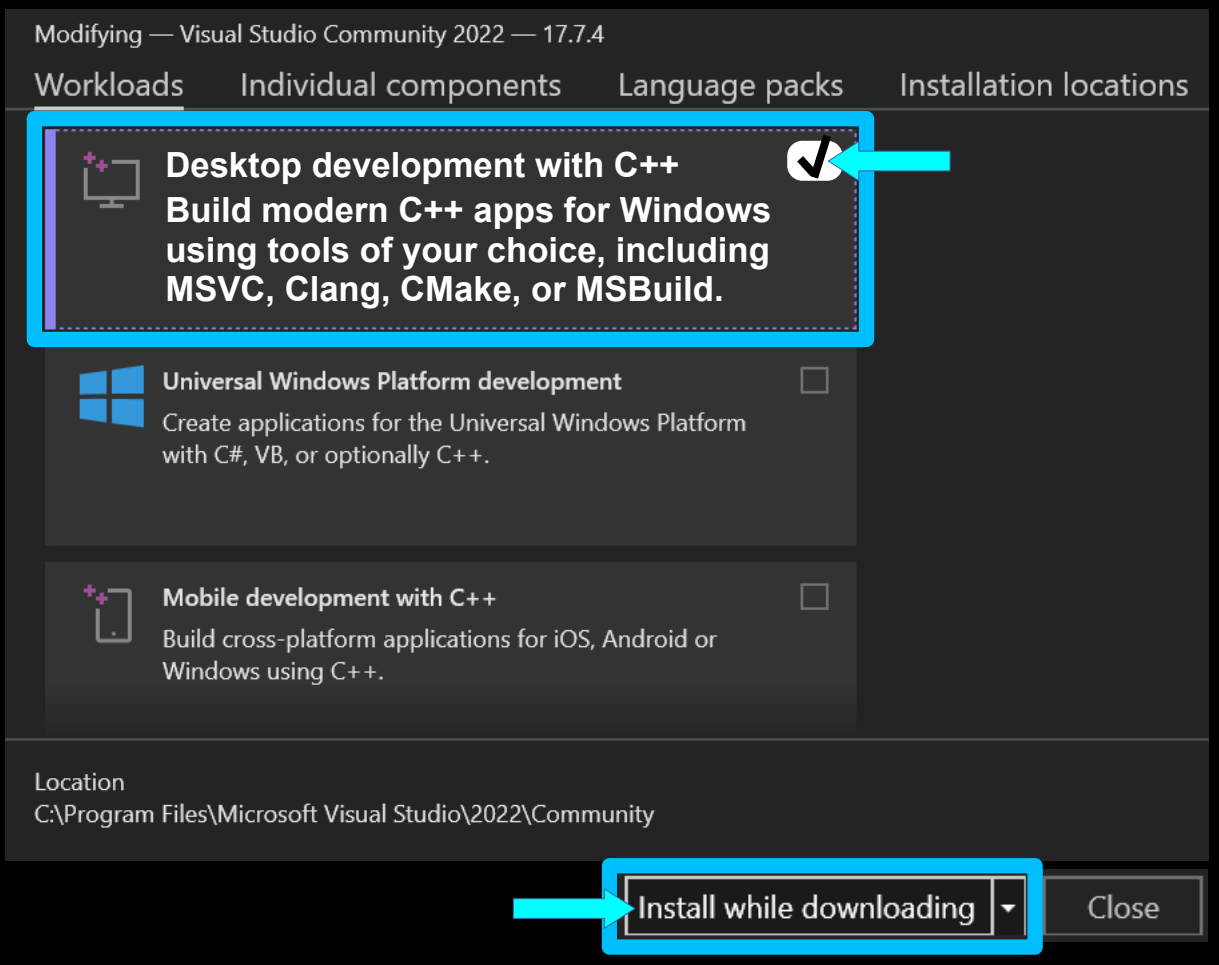
We Go To:
https://visualstudio.microsoft.com/vs/community

We Download: **Visual Studio Installer**

We Go To our Downloads Folder and:
Double Left Click the Install file to Install it.

After it is installed, we can open VS Studio.
Once, open, we can then install the C++ package.

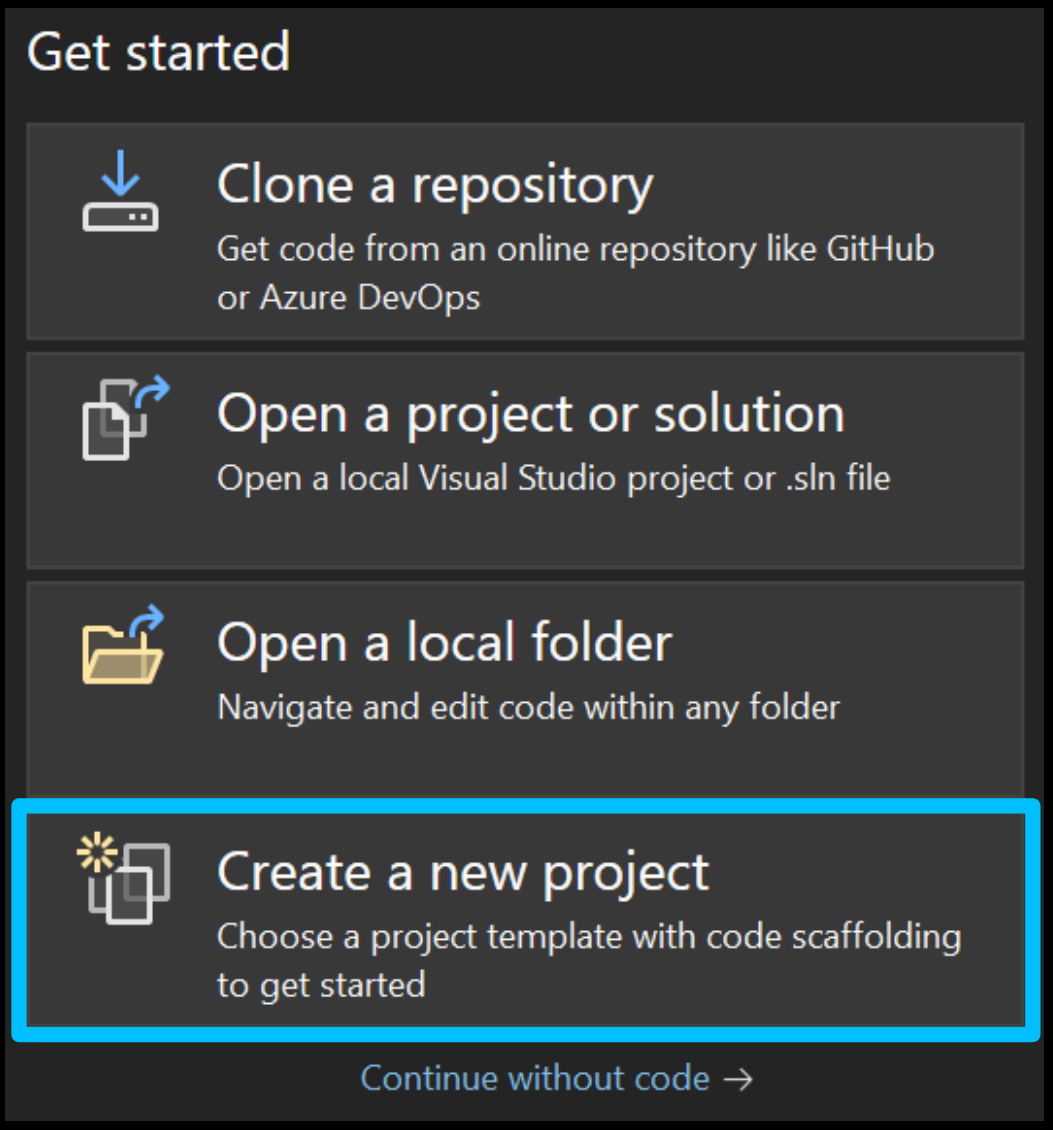
We Download and Install:
Desktop development with C++



We Put a Checkmark in the box and then Left Click the Install while downloading button

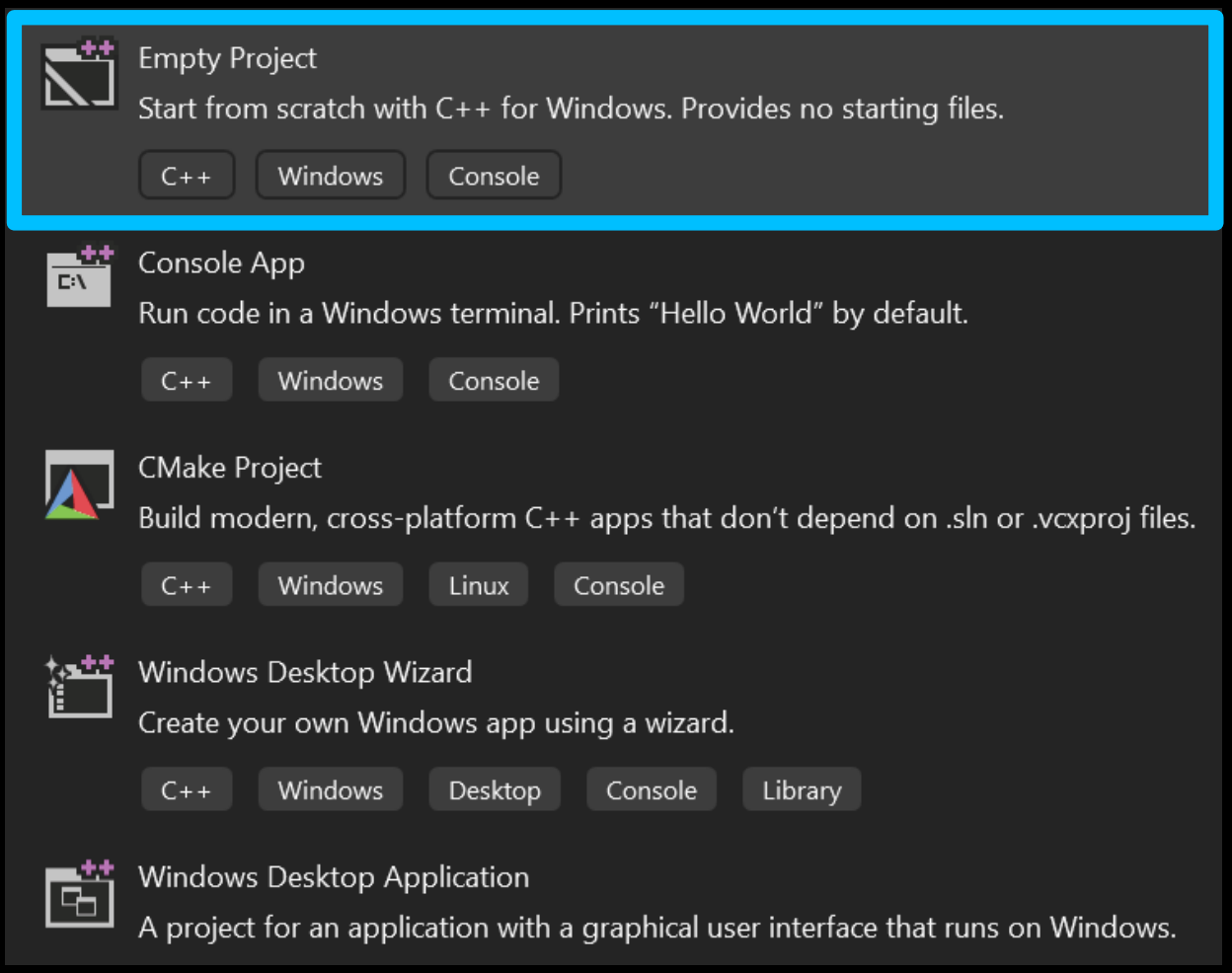
This will download and install the ability to use Visual Studio to create C++ Desktop Applications.

Create a New Project

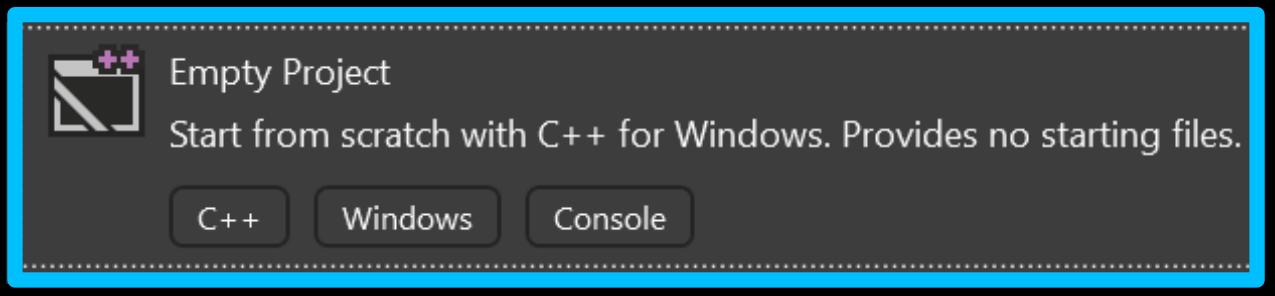


We Choose: Create a new project

Choices for a New Project

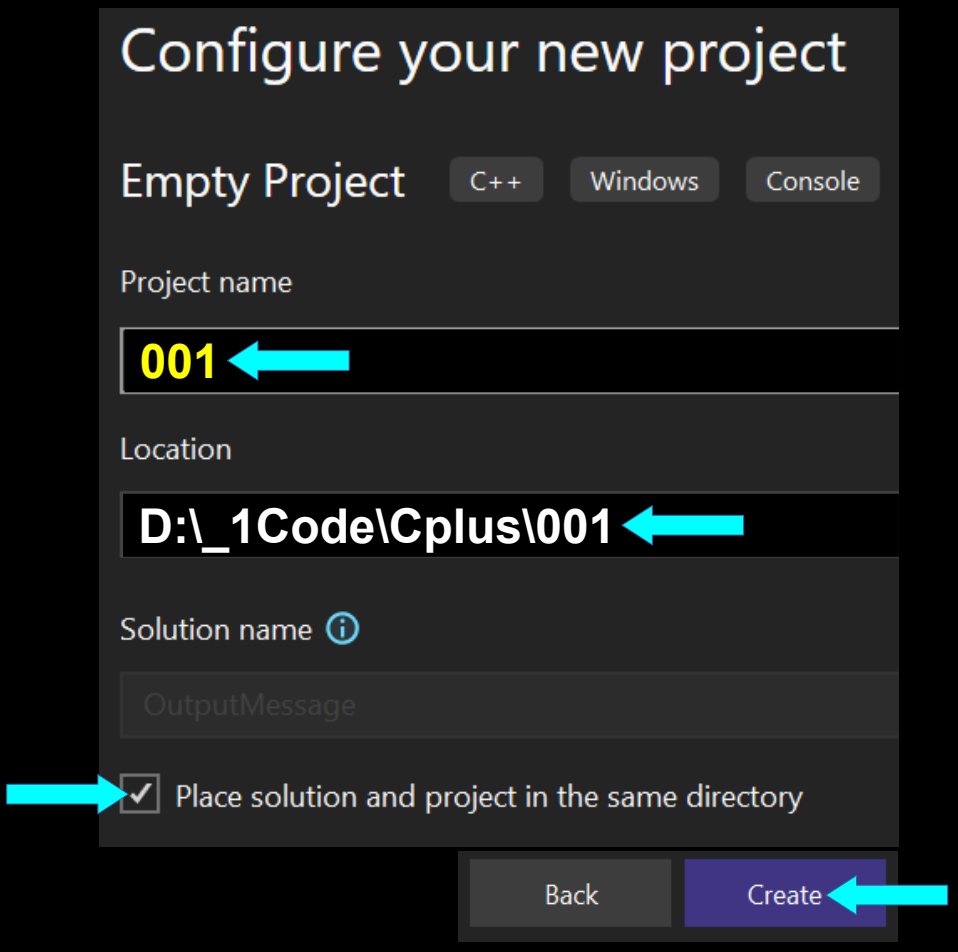


We Left Click: Empty Project



We Left Click: Next Button

Project Name - 001



We name our first project as: 001

We put a Checkmark in: Place solution and project in the same directory

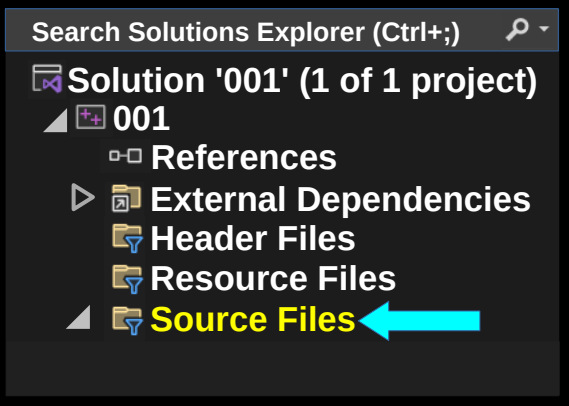
We Left Click on: Create Button

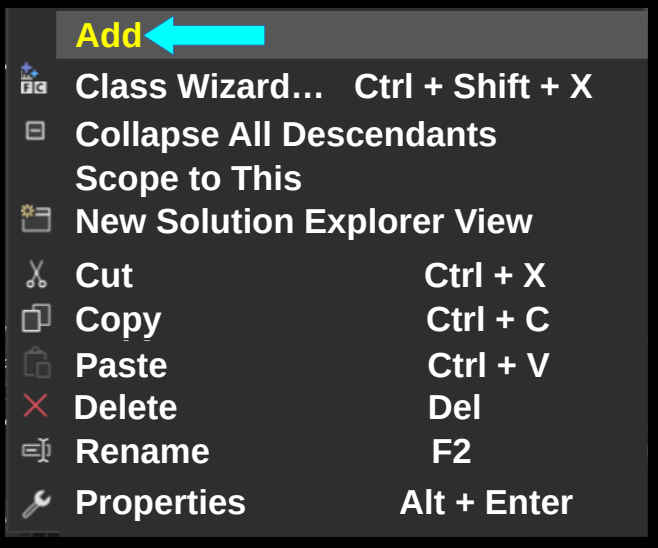
Creating our main.cpp file in Source Files Folder

We Right click on: Source Files Folder

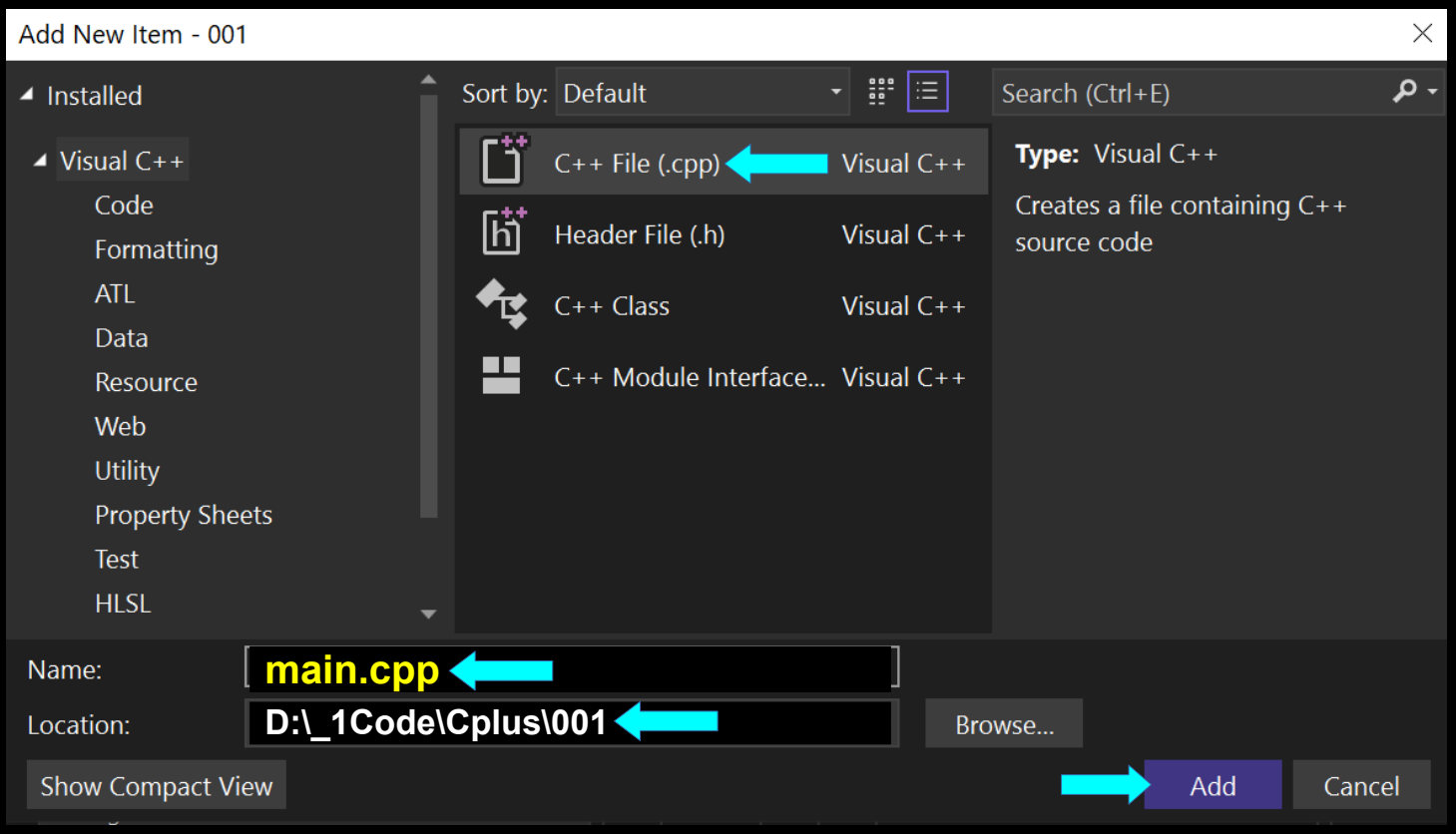
We Choose: Add

We Choose: New Item...





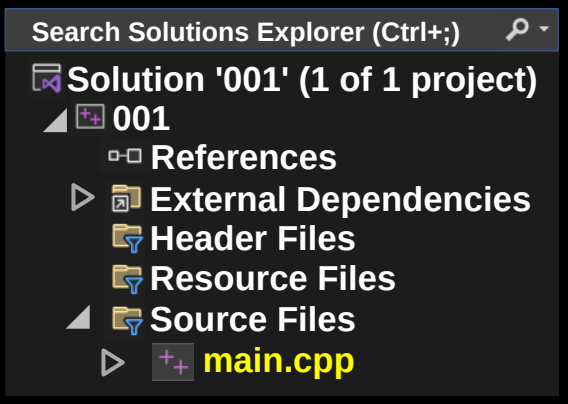
We Choose: C++ File (.cpp)



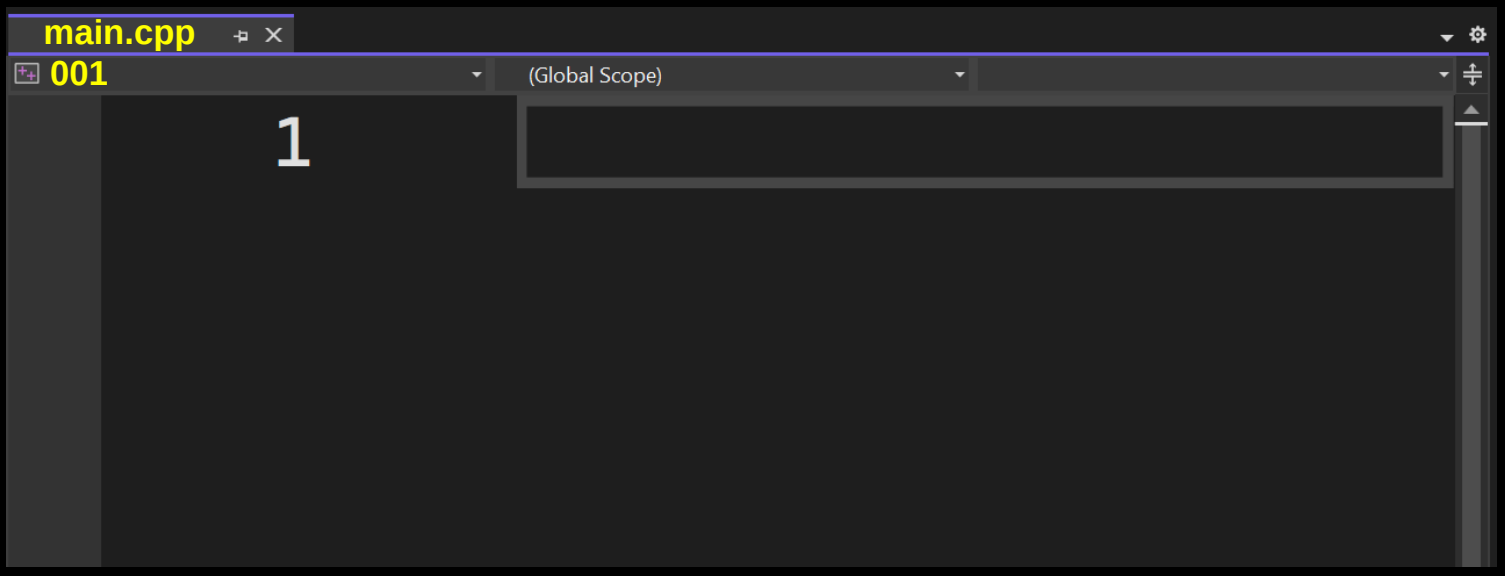
We name our file: main.cpp

We Left Click: Add button

We see our created file: main.cpp



main.cpp is now open



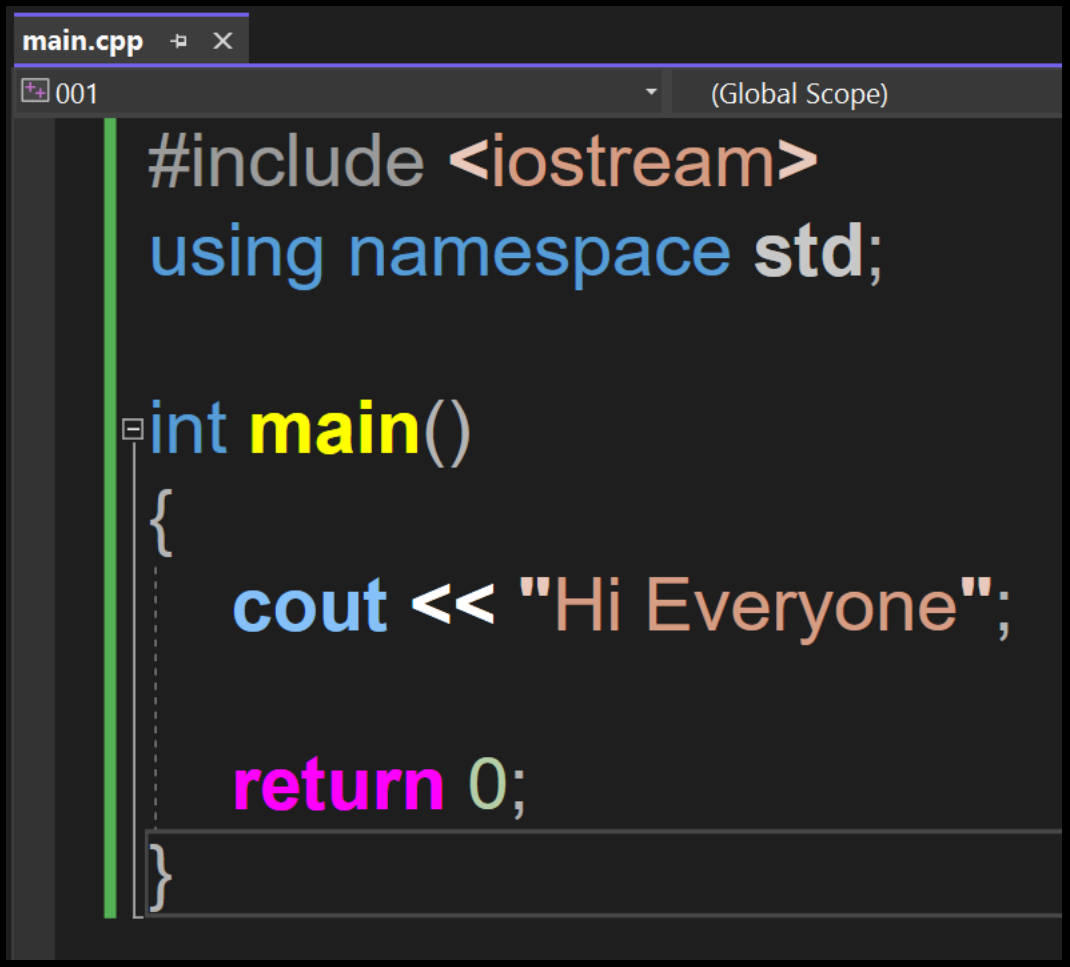
We can now: Type our Code :-)

We make Bigger Font by:
Control + Scroll Wheel Forward

We make Smaller Font by:
Control + Scroll Wheel Backward

main.cpp Code - Screenshot

Here is a screenshot of: Our C++ Code

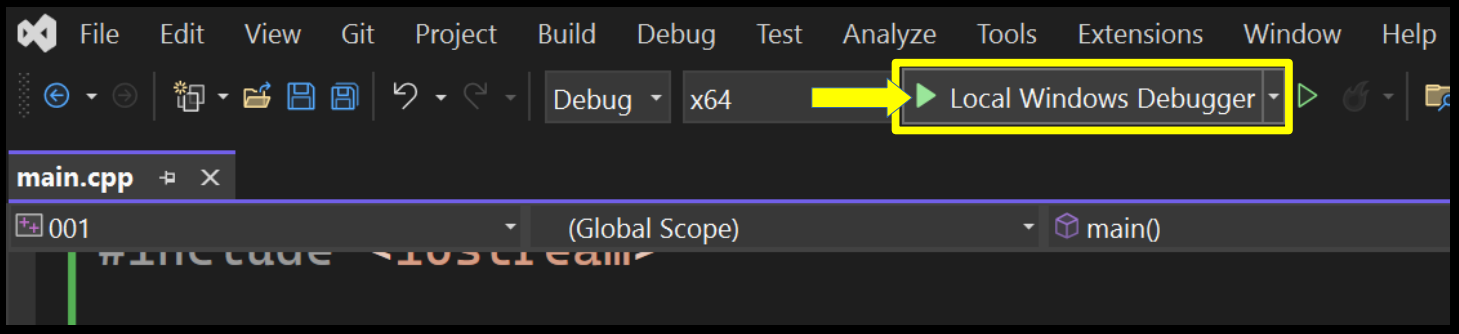


On the next page
we show the same code,
but with better font.

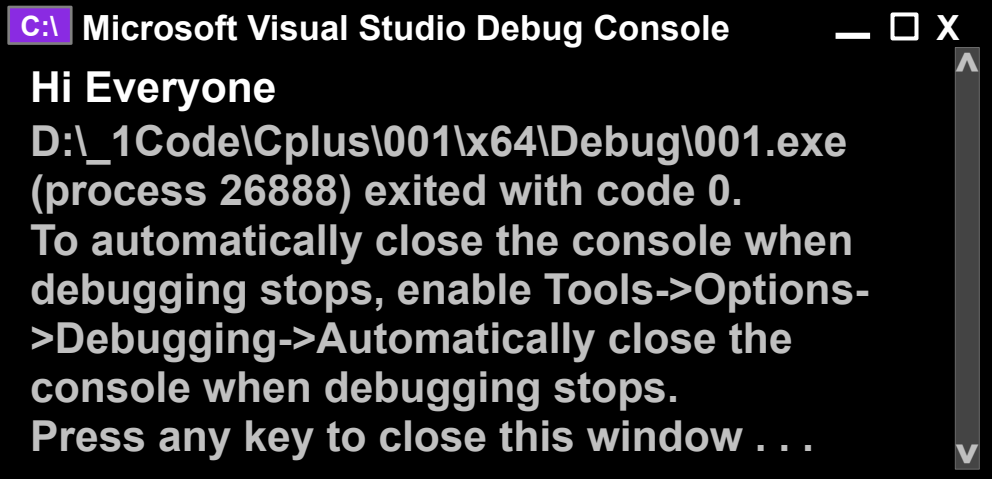
```
// Outputting Text

// main.cpp

#include <iostream>
using namespace std;

int main()
{
    cout << "Hi Everyone";

    return 0;
}
```

// Building and Running our App

We Left Click on: Local Windows Debugger



Our app opens in the Debug Console Window, with the message of: Hi Everyone



We make Bigger Console Font by:
Control + Scroll Wheel Forward

We make Smaller Console Font by:
Control + Scroll Wheel Backward

```
// Outputting Text and Exit by Pressing Enter

// main.cpp

#include <iostream>
using namespace std;

int main()
{
    cout << "Hi Everyone" << "\n";

    cout << "Press Enter to Exit";
    cin.get();

    return 0;
}
```

```
// Input from user

// main.cpp

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

int main()
{
    string name;

    cout << "Enter Name: ";
    cin >> name;

    cout << "Hi " << name;

    cout << "\nPress Enter to Exit";
    cin.ignore();
    cin.get();

    return 0;
}
```

```
// Custom function - askName

// main.cpp

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

string askName()
{
    string name;
    cout << "Enter Name: ";
    cin >> name;
    return name;
}

int main()
{
    string userName = askName();
    cout << "Hi, " << userName << "!" << "\n";

    cout << "\nPress Enter to Exit";
    cin.ignore();
    cin.get();
    return 0;
}
```

C:\ D:_1Code\Cplus\001\x64\Debug\001.exe

```
Enter Name: Christopher
Hi, Christopher!

Press Enter to Exit
```

```
// Custom Function - consoleLog

// main.cpp

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

void consoleLog(const string message)
{
    cout << message << "\n";
}

int main()
{
    consoleLog("Hi Everyone");

    cout << "Press Enter to Exit";
    cin.get();

    return 0;
}
```

Header File - We define our function in a header file for easy use

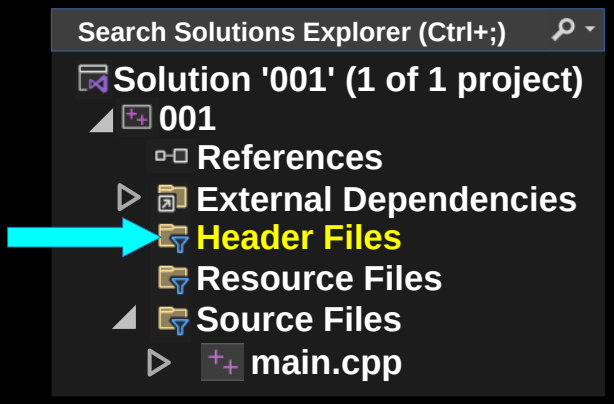
Instead of pasting this useful function in every script in our application, we will instead type it once in a header file and put it in the Header Files Folder.

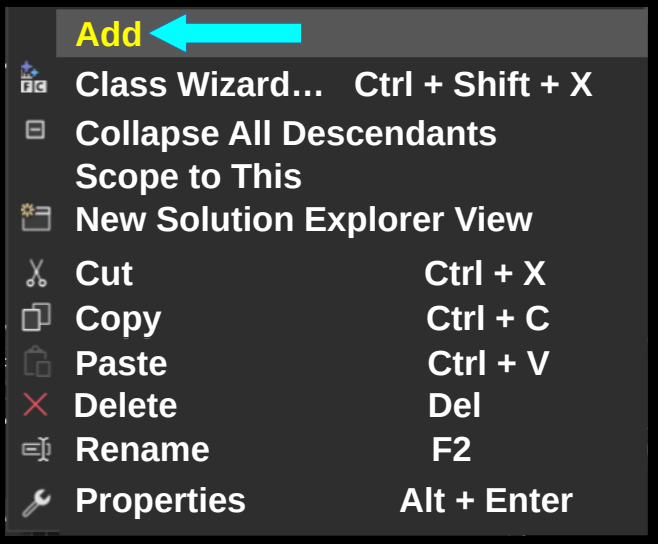
Using a header file is easier, because we place the header files in the Header Files folder and then include that header file with a reference in our main.cpp and other files.

In our header file, we type the terms
#ifndef
and
#define
to designate that it will be used in other files.

Header File - Add - New Item

We right click on: Header Files folder

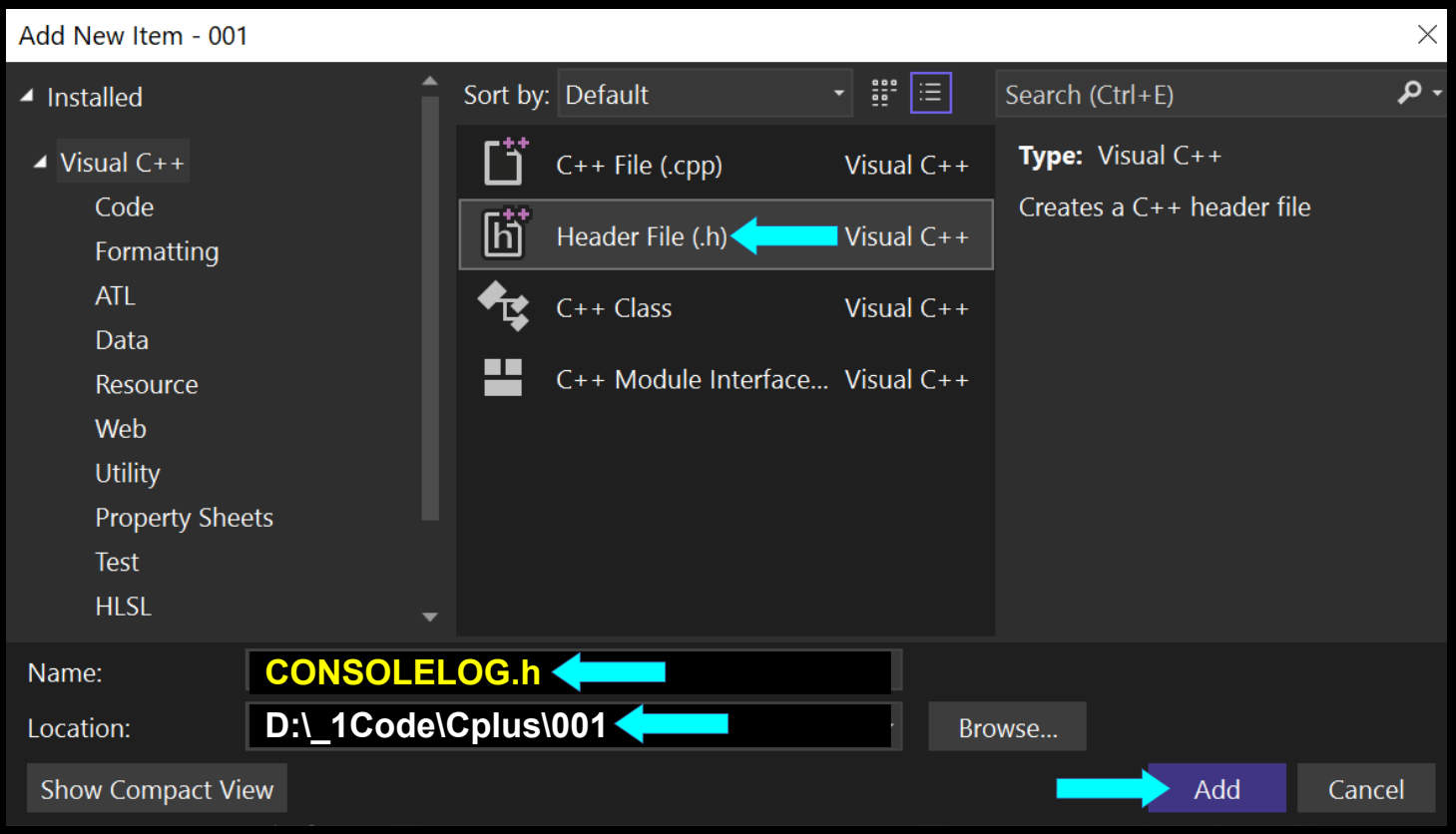




We choose: Add

We choose: New Item

We choose: Header File (.h)



We name it: CONSOLELOG.h

We Left Click: Add button

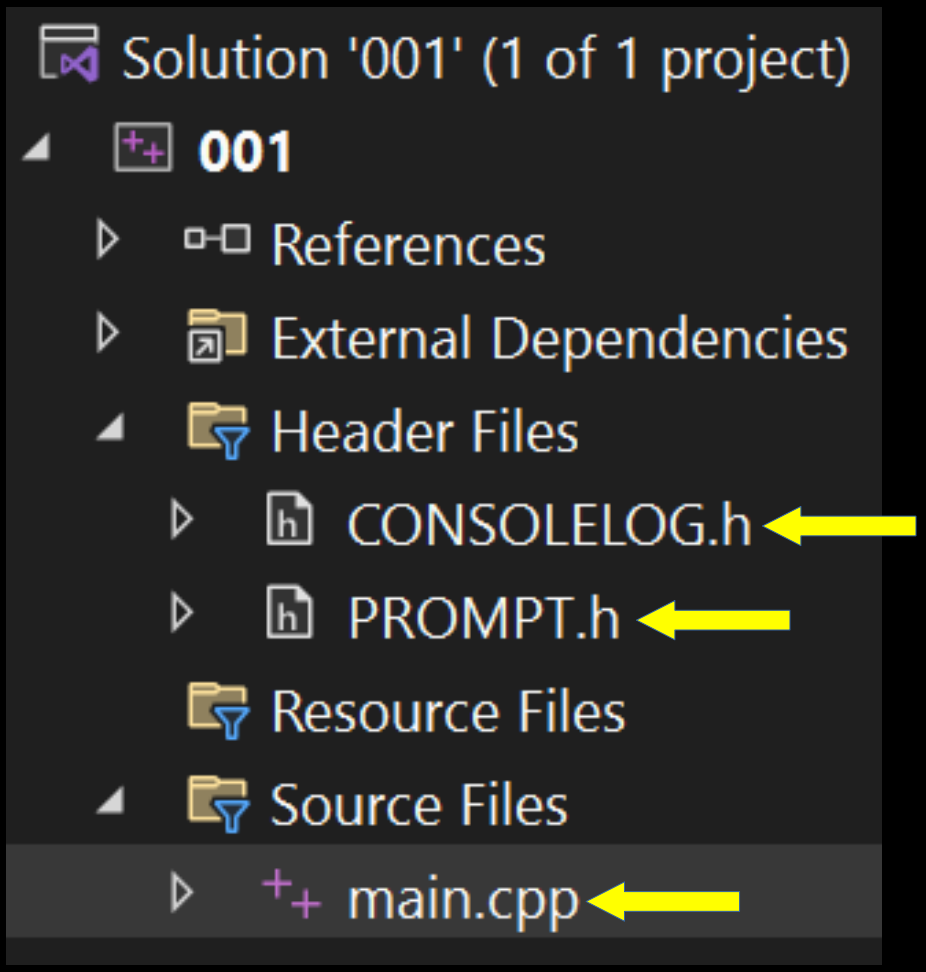
```
// CONSOLELOG.h header file

// CONSOLELOG.h

#ifndef CONSOLELOG
#define CONSOLELOG
#include <iostream>
#include <string>

void consoleLog(const std::string message)
{
    std::cout << message << "\n";
}

#endif
```

```
// Our main.cpp file uses the CONSOLE.h file

// main.cpp

#include <iostream>
#include <string>
#include "CONSOLELOG.h"
using namespace std;

int main()
{
    consoleLog("Hi Everyone");

    cout << "Press Enter to Exit";
    cin.get();

    return 0;
}
```

```
// PROMPT.h header file

// PROMPT.h

#ifndef PROMPT
#define PROMPT
#include <iostream>
#include <string>

void prompt(std::string& userInput)
{
   std::cin >> userInput;
}

#endif
```

```
// main.cpp uses CONSOLELOG.h and
PROMPT.h

// main.cpp


#include <iostream>
#include <string>
#include "PROMPT.h"
#include "CONSOLELOG.h"
using namespace std;

int main()
{
    string input;

    consoleLog("Enter Name");
    prompt(input);

    consoleLog("Hi " + input);

    consoleLog("Press Enter to Exit");
    cin.ignore();
    cin.get();

    return 0;
}
```

File Structure of the previous Examples



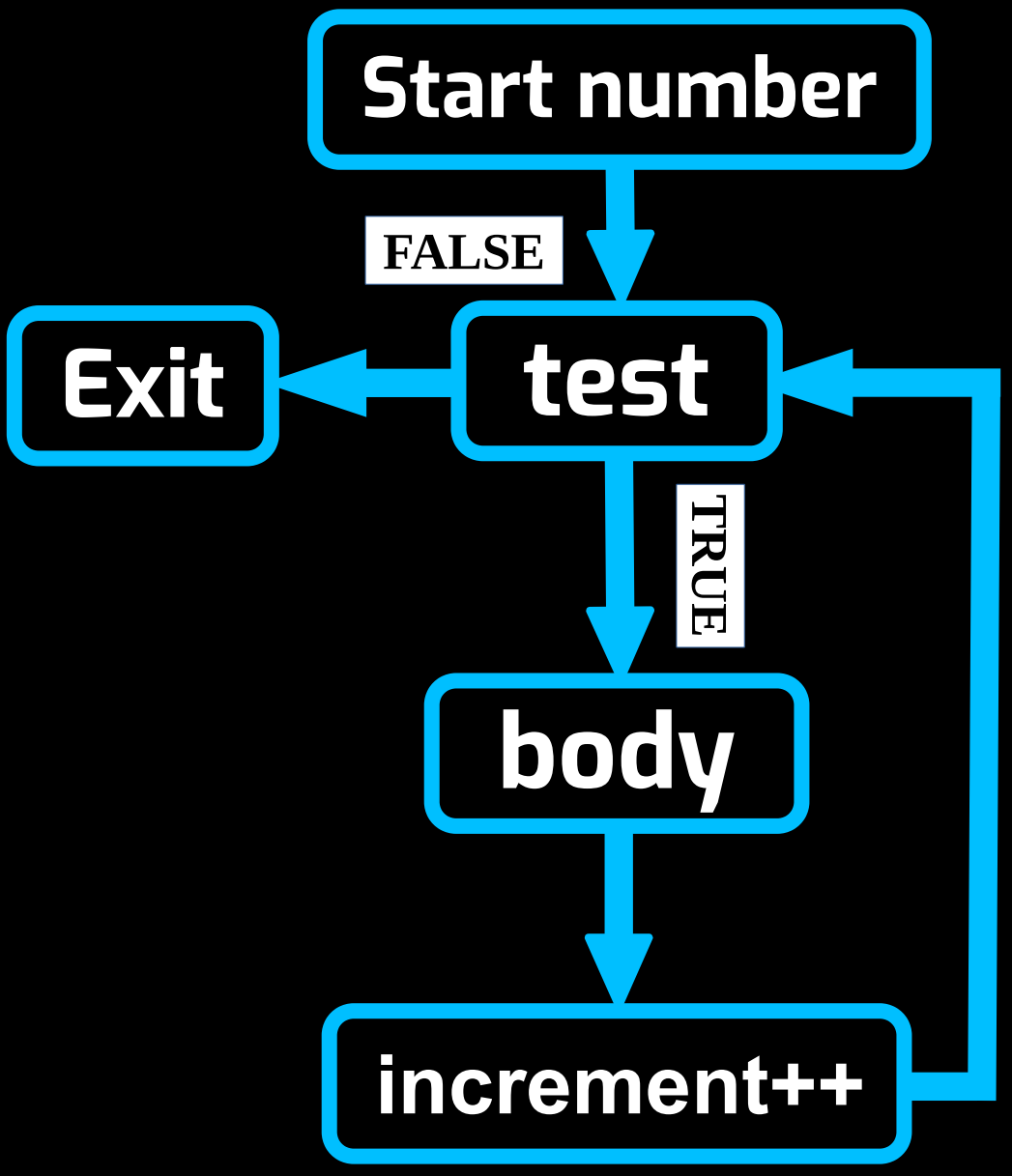
We have 2 Header Files:
CONSOLELOG.h
and
PROMPT.h

We have 1 main.cpp file:
main.cpp uses CONSOLELOG.h and PROMPT.h header files

```
// Array of Objects

// main.cpp

#include <iostream>
#include <string>
#include <vector>
using namespace std;

struct Person
{
    string name;
    int age;
};

int main()
{
    vector<Person> people =
    {
        {
            "Alice",
            25
        },

        {
```

```
        "Bob",
        30
    },

    {
        "Jane",
         28
    }
};

for (const auto person : people)
{
    cout << "Name: "
    << person.name
    << ", Age: "
    << person.age
    << "\n";
}

cout << "\nPress Enter to Exit";
cin.get();

return 0;
}
```

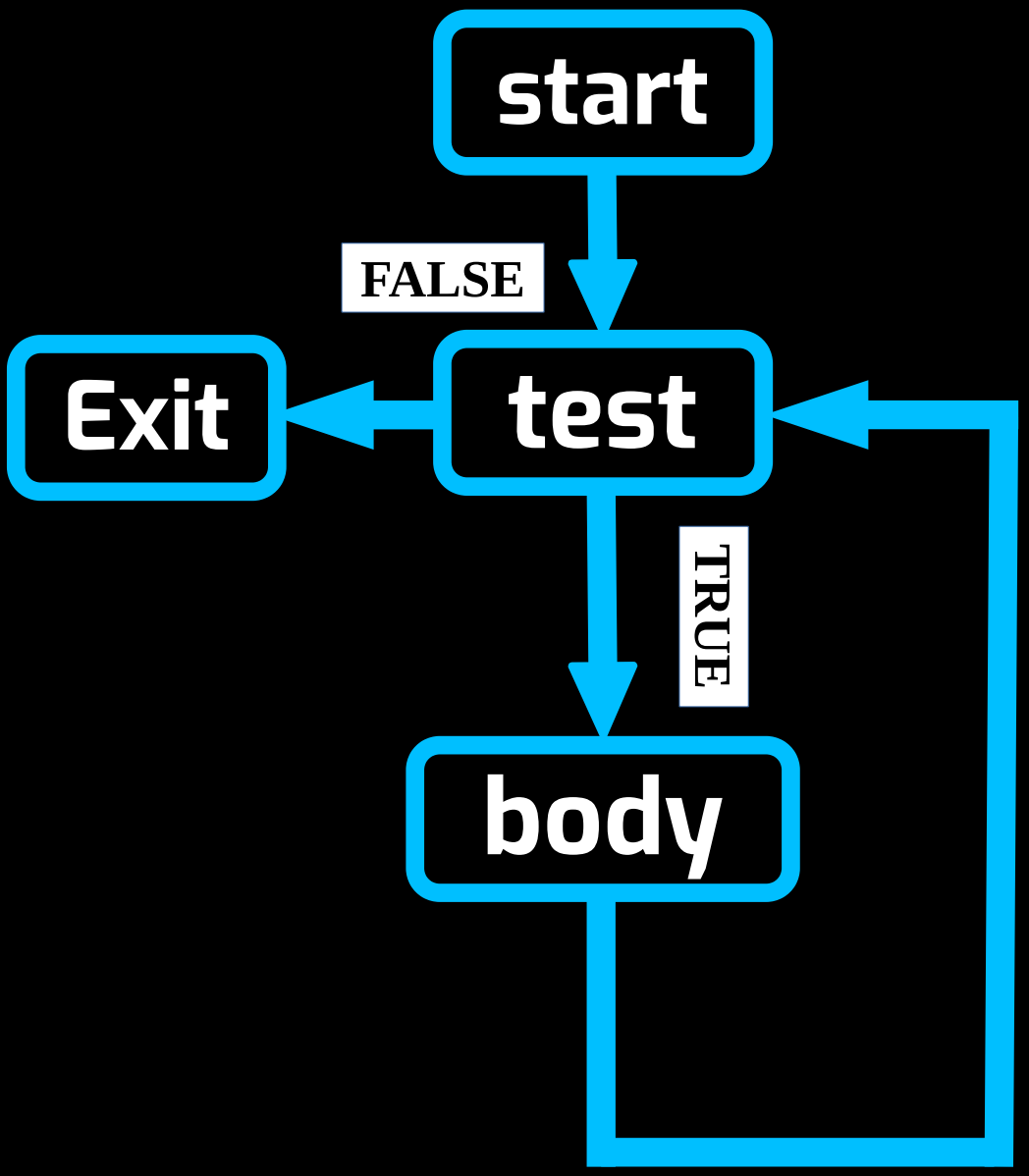
// for loop diagram



```
// for loop

// main.cpp

#include <iostream>
using namespace std;

int main()
{
    for (int i = 1; i <= 100; i++)
    {
        cout << i << " ";
        cout << "\n";
    }

    cout << "\nPress Enter to Exit";
    cin.get();

    return 0;
}
```

Christopher Topalian

// while loop diagram



```
// while loop

// main.cpp

#include <iostream>
using namespace std;

int main()
{
    int count = 0;

    while (count < 5)
    {
        cout << "Count: "
        << count + 1
        << "\n";
        count++;
    }

    cout << "Loop completed." << "\n";
    cout << "\nPress Enter to Exit";
    cin.get();

    return 0;
}
```

```
// if else

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

// main.cpp

int main()
{
    string name;
    cout << "Enter your name: ";
    cin >> name;

    if (name == "Chris")
    {
        cout << "Hi Chris.\nIt is good that you are
visiting Earth." << "\n";
    }
    else
    {
        cout << "Howdy " << name << ". "
        << "Tell Chris to Sign in later."
        << "\n";
    }
```

```
    cout << "\nPress Enter to Exit";
    cin.ignore();
    cin.get();

    return 0;
}
```

```
C:\ D:\_1Code\Cplus\001\x64\Debug\001.exe
Enter your name: John
Howdy John. Tell Chris to Sign in later.

Press Enter to Exit_
```

```
C:\ D:\_1Code\Cplus\001\x64\Debug\001.exe
Enter your name: Chris
Hi Chris.
It is good that you are visiting Earth.

Press Enter to Exit_
```

```
// Open Browser to a URL

// main.cpp

#include <windows.h>

int main()
{
    ShellExecuteA(NULL, "open",
"https://www.google.com", NULL, NULL,
SW_SHOWNORMAL);

    return 0;
}
```

```
// Custom Function - Open Browser to a URL

// main.cpp

#include <windows.h>
#include <string>
using namespace std;

void openURL(const string url)
{
    ShellExecuteA(NULL, "open", url.c_str(),
NULL, NULL, SW_SHOWNORMAL);
}

int main()
{
    string url = "https://www.google.com";

    openURL(url);

    return 0;
}
```

```
// Create Text File with Data

// main.cpp

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

int main()
{
    // open file for writing
    std::ofstream outputFile("ourTextFile.txt");

    // write data to file
    outputFile << "Hi Everyone" << "\n";

    // close file
    outputFile.close();

    cout << "Data written successfully."
    << "\n";

    return 0;
}
```

```
// Custom Function - Create Text File with Data

// main.cpp

#include <iostream>
#include <string>
#include <fstream>
using namespace std;

void writeToFile(const string filename, const
string content)
{
    // open file for writing
    std::ofstream outputFile(filename);

    // write data to the file
    outputFile << content << "\n";

    // close the file
    outputFile.close();

    cout << "Data written to "
    << filename << " successfully."
    << "\n";
}
```

```
int main()
{
    string filename = "ourTextFile.txt";

    string content = "Hi Everyone";

    writeToFile(filename, content);

    return 0;
}
```

```
// Read a Text File

// main.cpp

#include <iostream>
#include <string>
#include <fstream>
using namespace std;

void displayFileContents(const string filename)
{
    // open file for reading
    std::ifstream inputFile(filename);

    // check if the file is open
    if (!inputFile.is_open())
    {
        std::cerr << "Error opening file: "
        << filename
        << "\n";

        return;
    }

    // read and display file contents
```

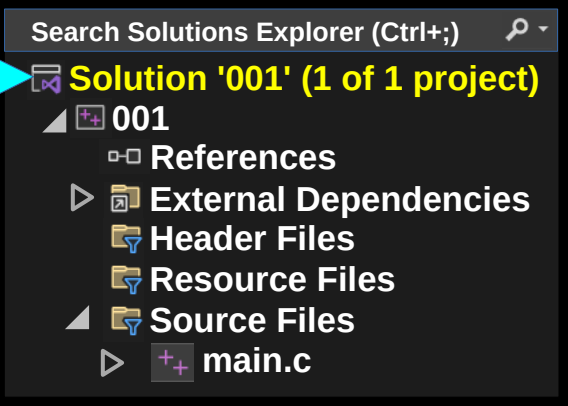
```
    string line;

    cout << "Contents of "
    << filename << ":" << "\n";

    while (std::getline(inputFile, line))
    {
        cout << line << "\n";
    }

    // close the file
    inputFile.close();
}

int main()
{
    string filename = "ourTextFile.txt";

    displayFileContents(filename);

    cout << "\nPress Enter to Exit";
    cin.get();

    return 0;
}
```

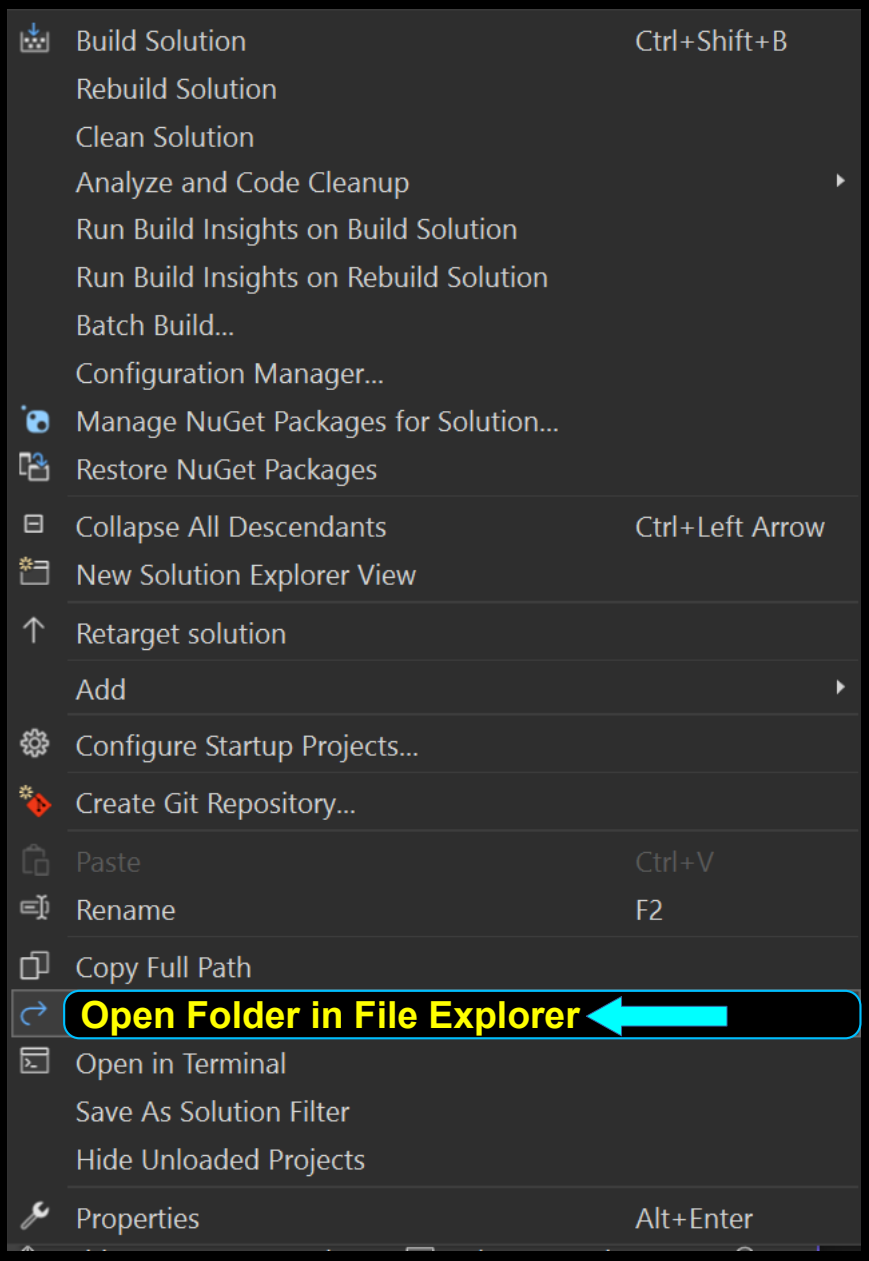
```
// Count Number of Lines in a Text File

// main.cpp

#include <iostream>
#include <fstream>
#include <string>
using namespace std;

int main()
{
    // open text file
    std::ifstream inputFile("ourTextFile.txt");

    // check if text file opened
    if (!inputFile.is_open())
    {
        std::cerr << "File won't open file."
        << "\n";

        // return an error code
        return 1;
    }
```

```
    // variable to store how many lines found in
text file
    int lineCount = 0;

    // variable to store each line of text read from
text file
    string line;

    // read text file line by line and count lines
    while (std::getline(inputFile, line))
    {
        lineCount++;
    }

    // close the file
    inputFile.close();

    // show the total number of lines
    cout << "Number of lines in the file: "
    << lineCount << "\n";

    return 0;
}
```

// How to Find Our Application .exe File

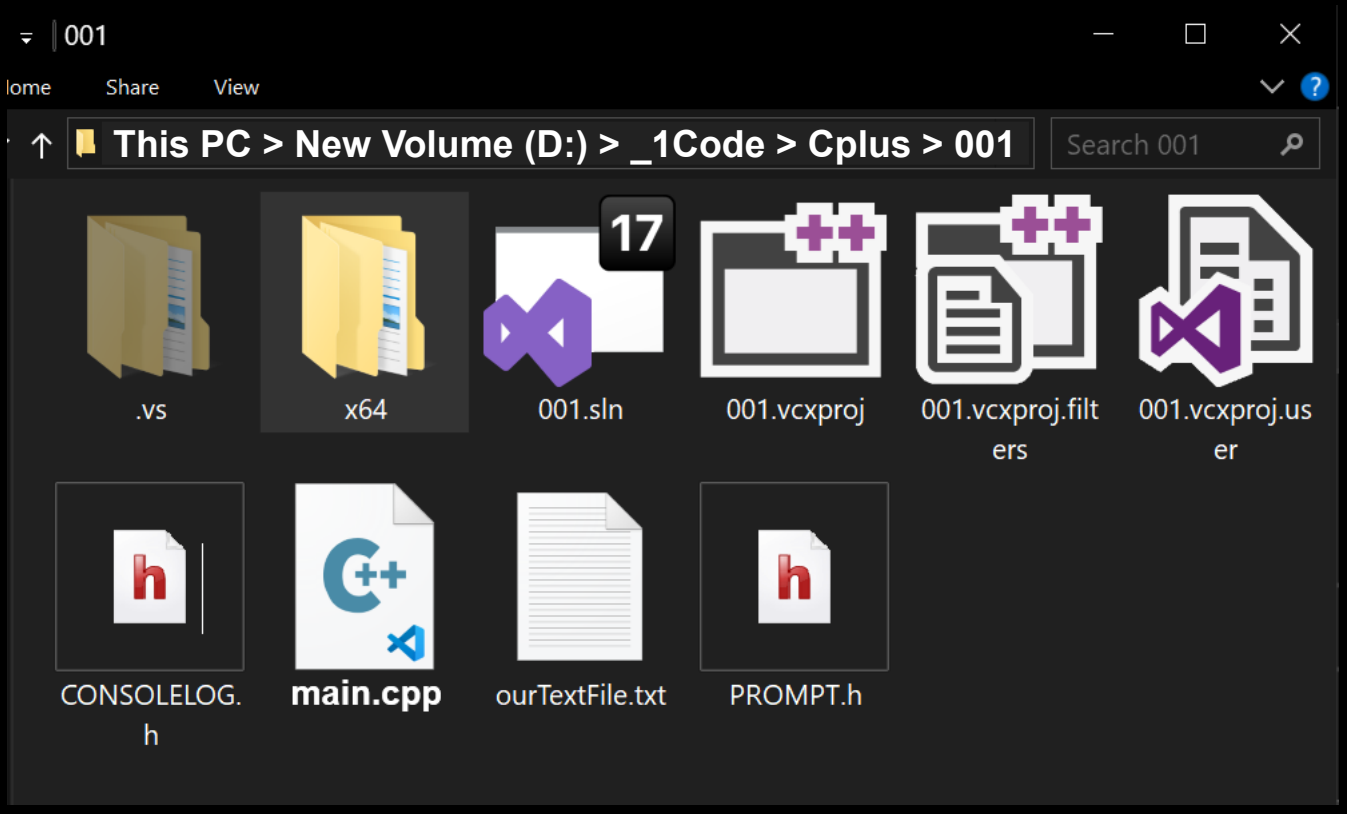
We put mouse arrow on: Solution '001' (1 of 1 project)



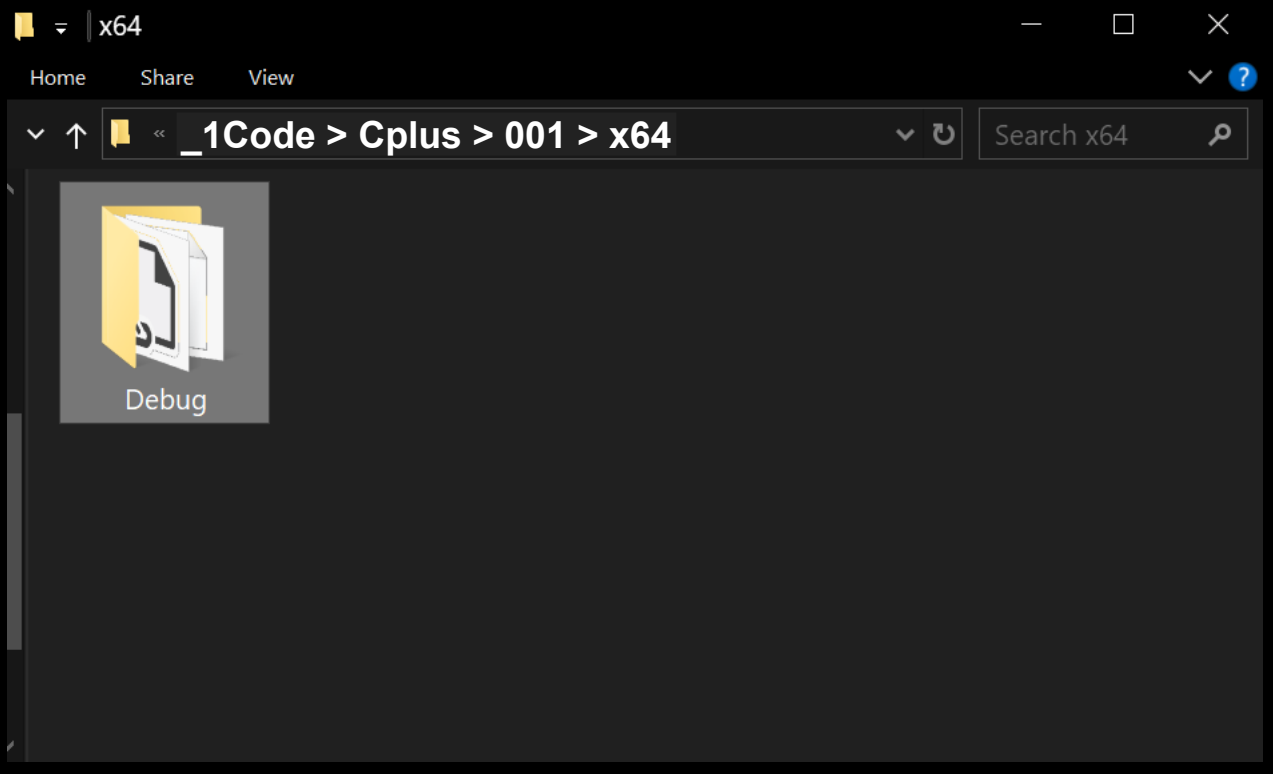


We Choose: Open Folder in File Explorer

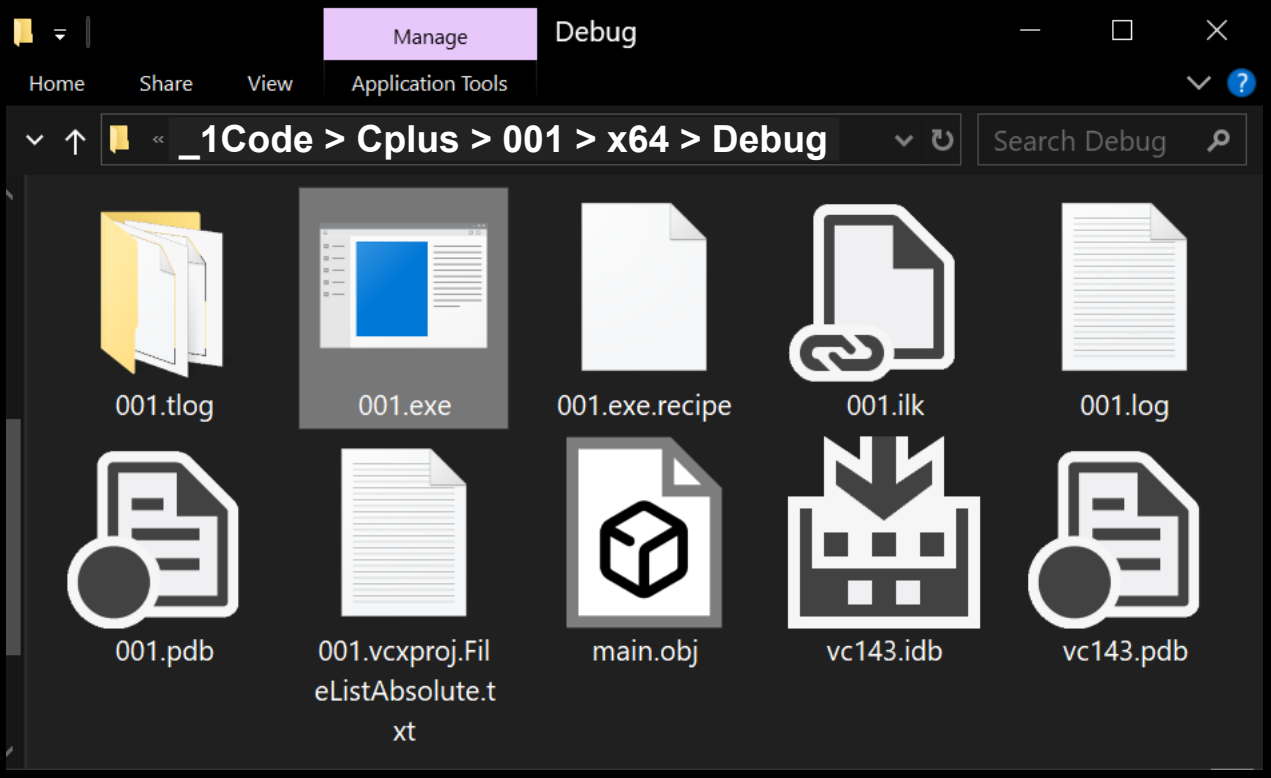
We see that our Project Folder has opened:



We Open: x64 Folder to find the Debug Folder



We Open: Debug Folder to find 001.exe



We Double Left Click: 001.exe

Our application should activate.

Happy Programming :-)

```
// Get Current Working Directory

// main.cpp

#include <iostream>
#include <windows.h>
using namespace std;

int main()
{
    wchar_t buffer[MAX_PATH];

    // get the current working directory
    if (!GetCurrentDirectoryW(MAX_PATH,
buffer))
    {
        std::wcerr << L"Error getting current
working directory" << std::endl;

        return EXIT_FAILURE;
    }

    std::wcout << L"Current working directory: "
<< buffer << std::endl;
```

```
    cout << "\nPress Enter to Exit";
    cin.get();

    return EXIT_SUCCESS;
}

/*
Current working directory: D:\_1CodeArc\
Cplus\001\x64\Debug

Press Enter to Exit
*/
```

```
// Make New Folder in Specified Location

#include <iostream>
#include <windows.h>

int main()
{
    // specify path of new folder
    LPCWSTR folderPath = L"C:\\Users\\energy\\
Desktop\\ourNewFolder";

    // create the new folder
    if (CreateDirectory(folderPath, NULL) ||
GetLastError() == ERROR_ALREADY_EXISTS)
    {
        std::wcout << L"Folder created
successfully or already exists: " << folderPath
<< std::endl;
    }
    else
    {
        std::wcerr << L"Error creating folder: "
        << folderPath << std::endl;
    }
    return 0;
}
```

```
// Make a New Folder in Documents

#include <iostream>
#include <windows.h>
#include <shlobj.h>

int main()
{
    // get path of Documents folder
    WCHAR documentsPath[MAX_PATH];
    if (SHGetFolderPathW(NULL,
CSIDL_PERSONAL, NULL, 0, documentsPath) !
= S_OK)
    {
        std::wcerr << L"Error getting Documents
path" << std::endl;
        return 1;
    }

    // append name of new folder
    std::wstring newFolderPath =
std::wstring(documentsPath) + L"\\
NewFolder7";

    // create the new folder
```

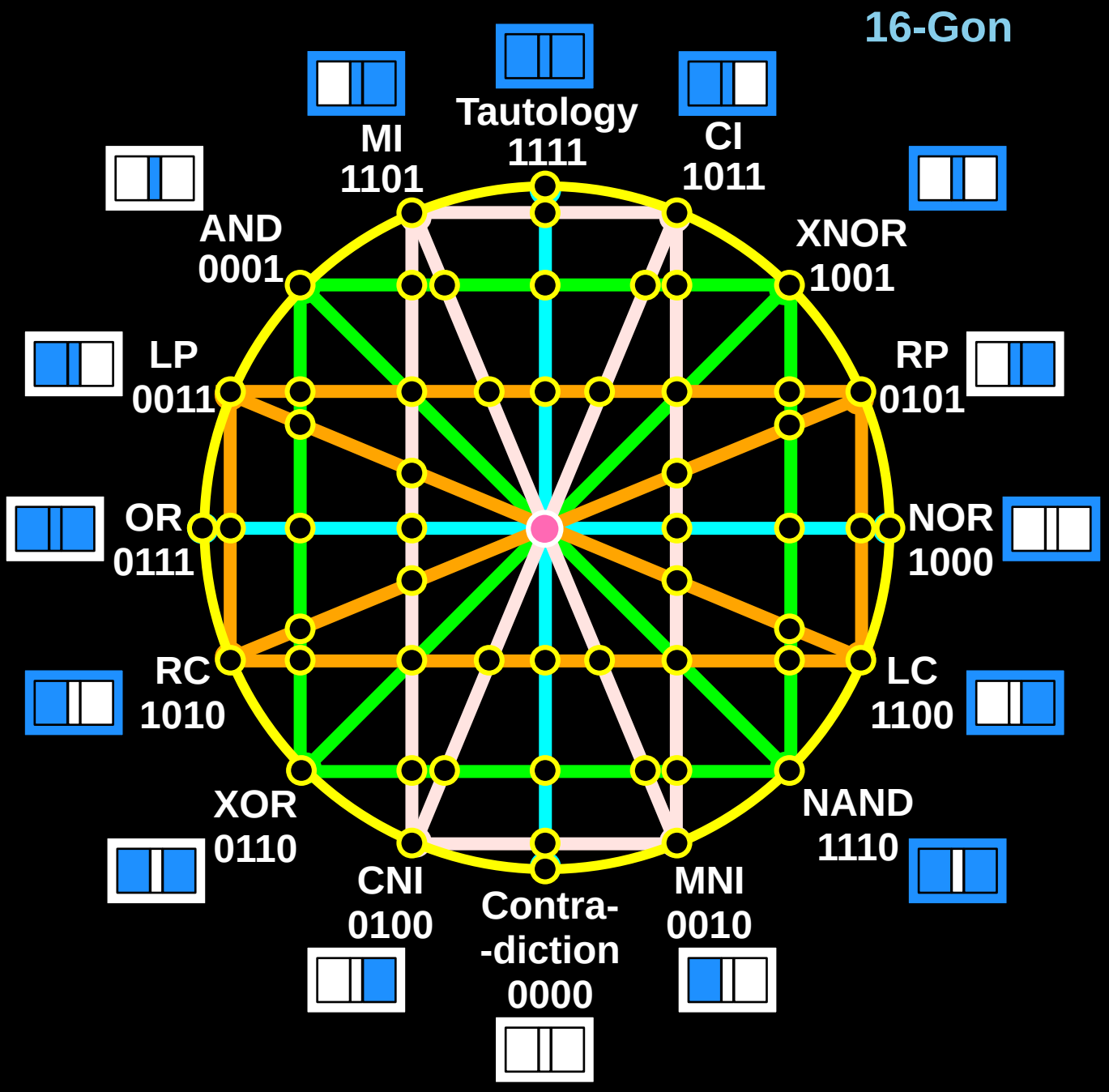
```
    if (!CreateDirectoryW(newFolderPath.c_str(),
NULL))
    {
        std::wcerr << L"Error creating folder: "
        << GetLastError() << std::endl;
        return 1;
    }

    std::wcout << L"Folder created successfully:
" << newFolderPath << std::endl;

    return 0;
}
```

```
// Make a New Folder on the Desktop

#include <iostream>
#include <windows.h>
#include <shlobj.h>

int main()
{
    // get path of Desktop folder
    WCHAR desktopPath[MAX_PATH];

    if (SHGetFolderPathW(NULL,
CSIDL_DESKTOP, NULL, 0, desktopPath) !=
S_OK)
    {
        std::wcerr << L"Error getting Desktop
path" << std::endl;
        return 1;
    }

    // append name of new folder
    std::wstring newFolderPath =
std::wstring(desktopPath) + L"\\NewFolder";

    // create the new folder
```

```
    if (!CreateDirectoryW(newFolderPath.c_str(),
NULL))
    {
        std::wcerr << L"Error creating folder: "
        << GetLastError() << std::endl;
        return 1;
    }

    std::wcout << L"Folder created successfully:
" << newFolderPath << std::endl;

    return 0;
}
```

Christopher Topalian

True Artificial Intelligence System



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Dedicated to God the Father

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Write & Type EVERY example that you find.
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