

C++ Computer Science

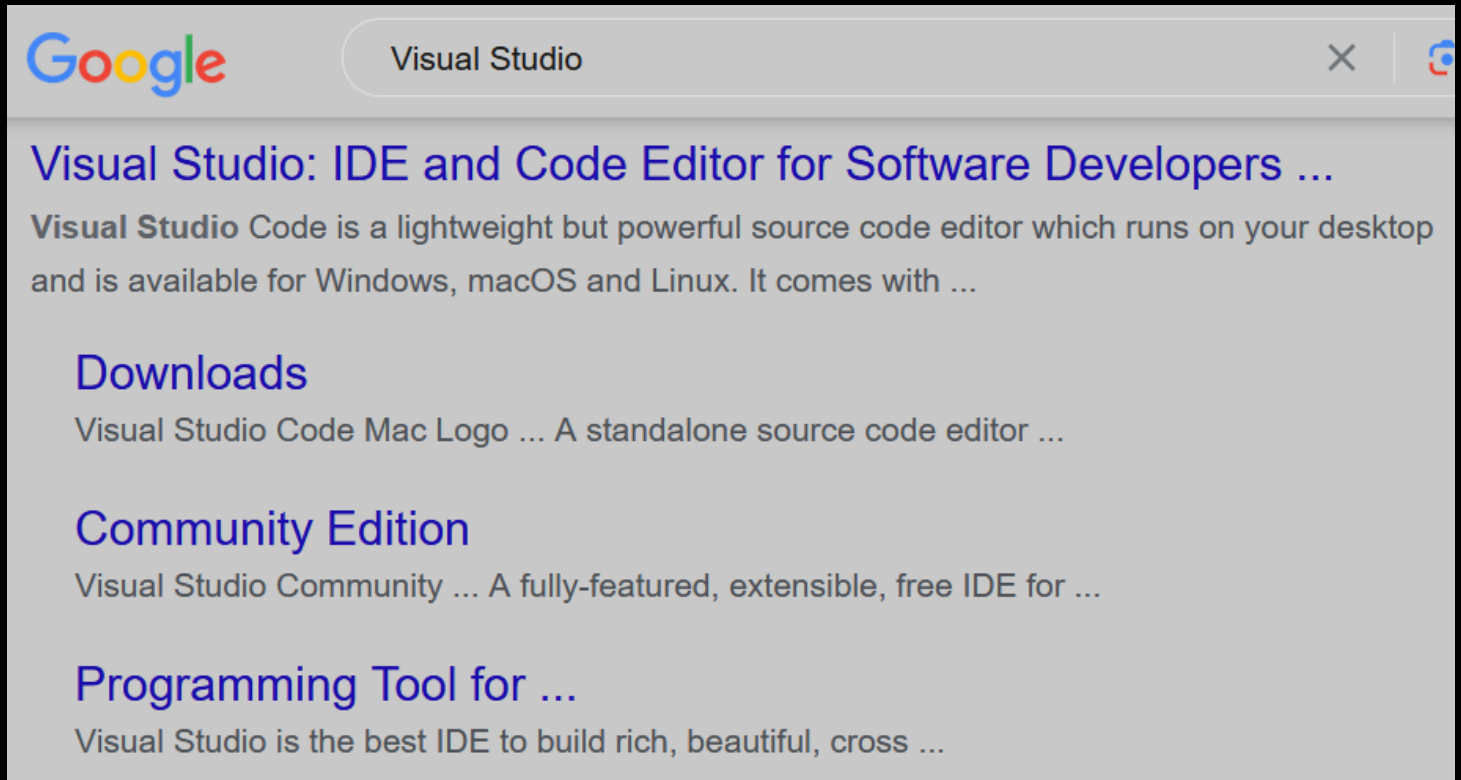
by

Christopher Andrew Topalian

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Dedicated to God the Father

Download Visual Studio - Search Google



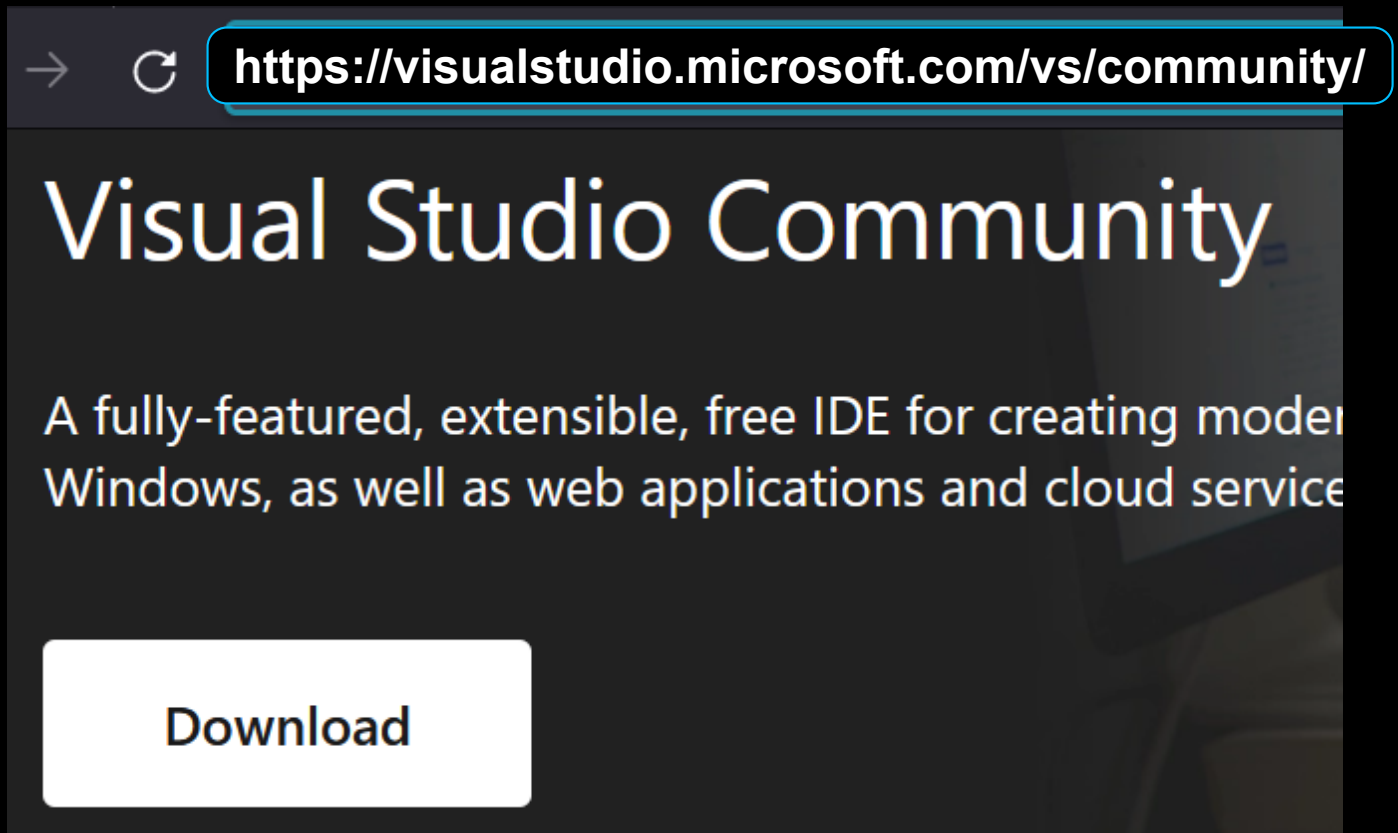
We Go To: google.com

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

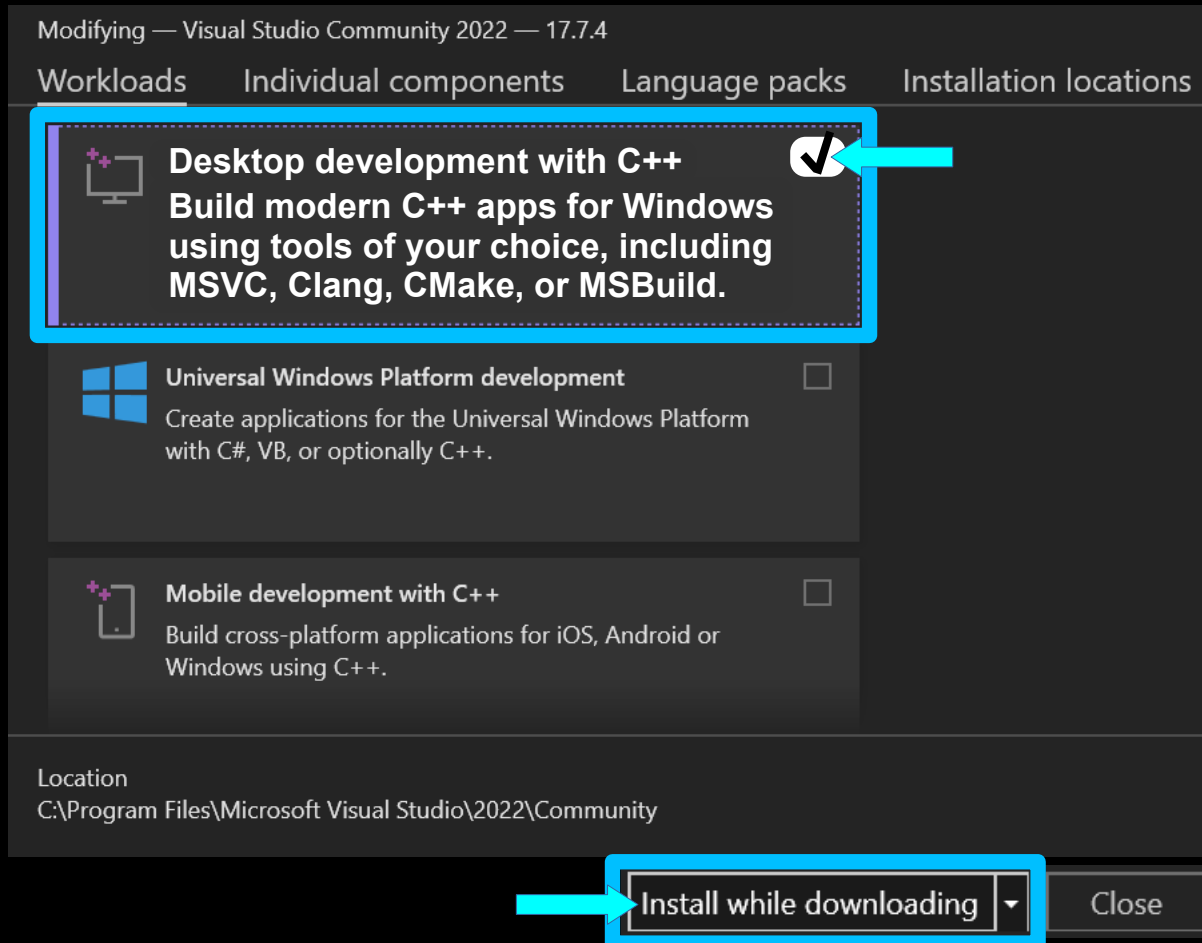
We Go To our Downloads Folder and:

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.

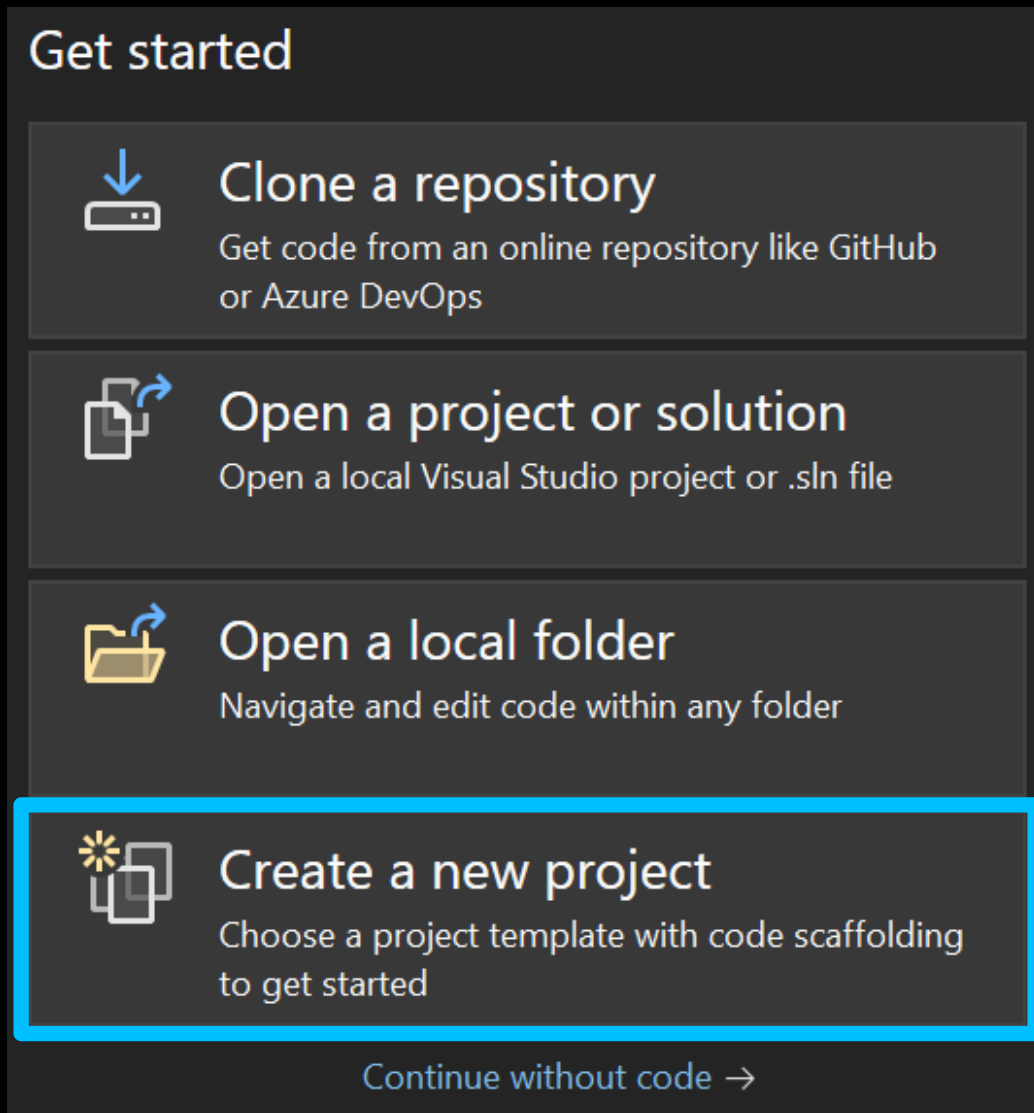
We Download and Install: Desktop development with C++



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

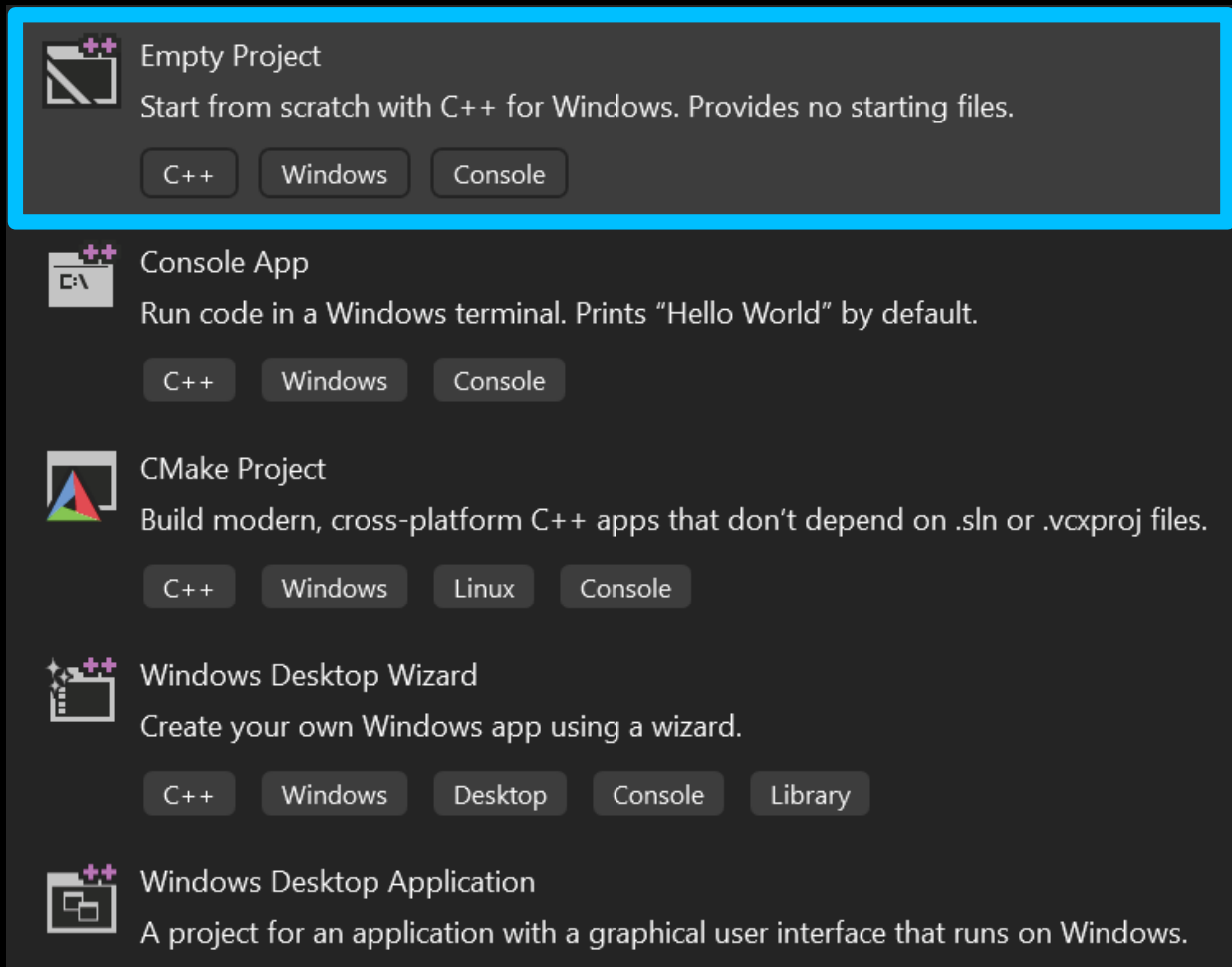
This will download and install
the ability to use Visual Studio
to create C++ Desktop Applications.

Create a New Project

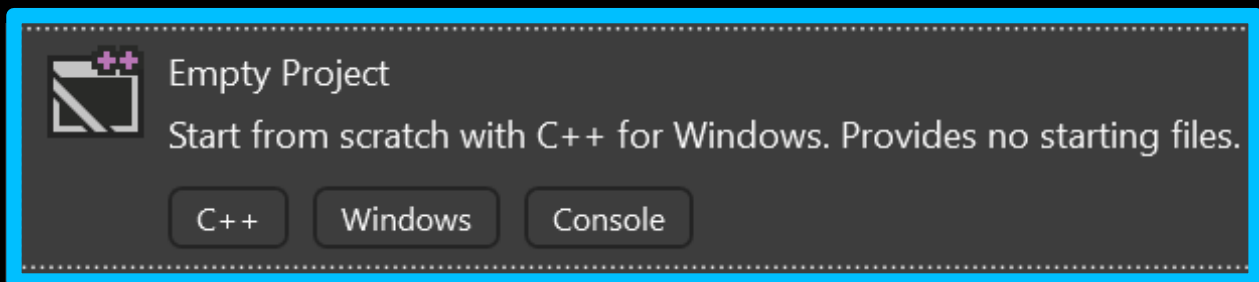


We Choose: Create a new project

Choices for a New Project



We Left Click: Empty Project



We Left Click: Next Button



Project Name - 001

Configure your new project

Empty Project C++ Windows Console

Project name

001

Location

D:_1Code\Cplusplus\001

Solution name ⓘ

OutputMessage

☒ Place solution and project in the same directory

Back Create

We name our first project as: 001

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

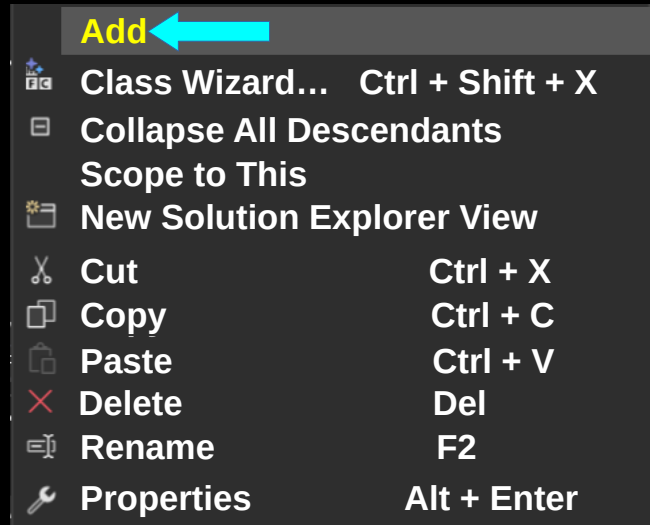
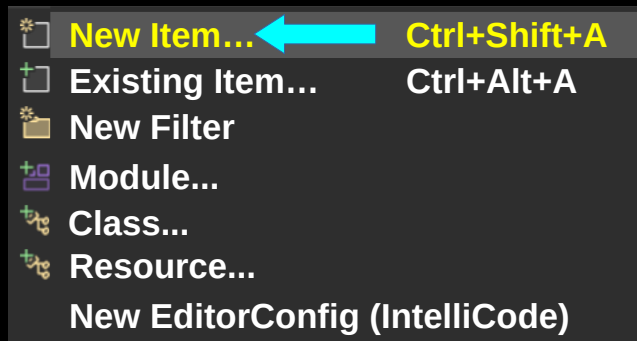
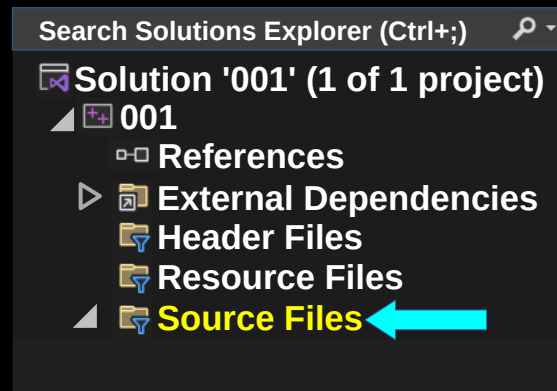
We Left Click on: Create Button

Creating our main.cpp file in Source Files Folder

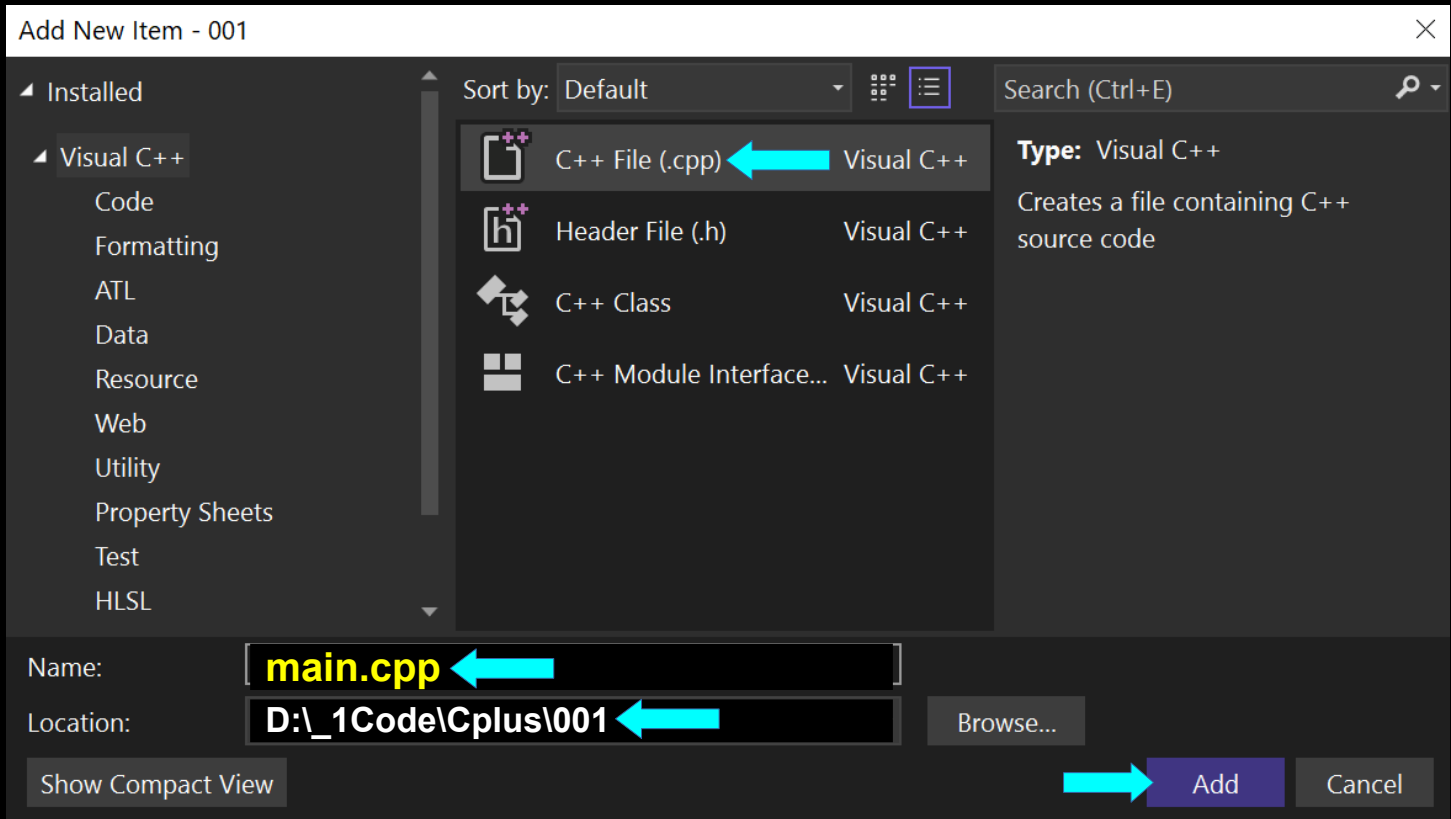
We Right click on: **Source Files** Folder

We Choose: **Add**

We Choose: **New Item...**



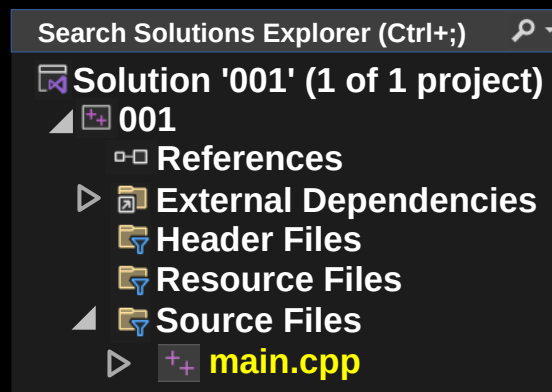
We Choose: C++ File (.cpp)



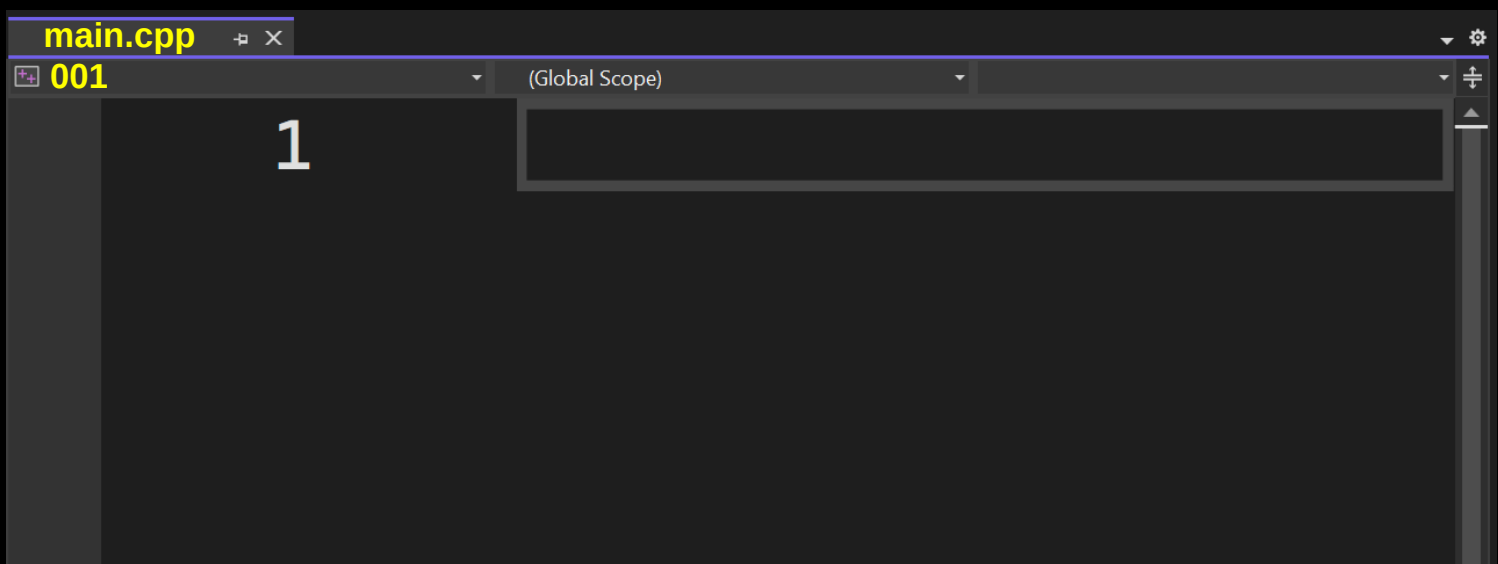
We name our file: **main.cpp**

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

A screenshot of a code editor window titled 'main.cpp'. The editor shows C++ code with syntax highlighting. The code includes the `<iostream>` header, uses the `std` namespace, and defines a `main` function that prints 'Hi Everyone' and returns 0. The code is as follows:

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

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

    return 0;
}
```

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

// Outputting Text

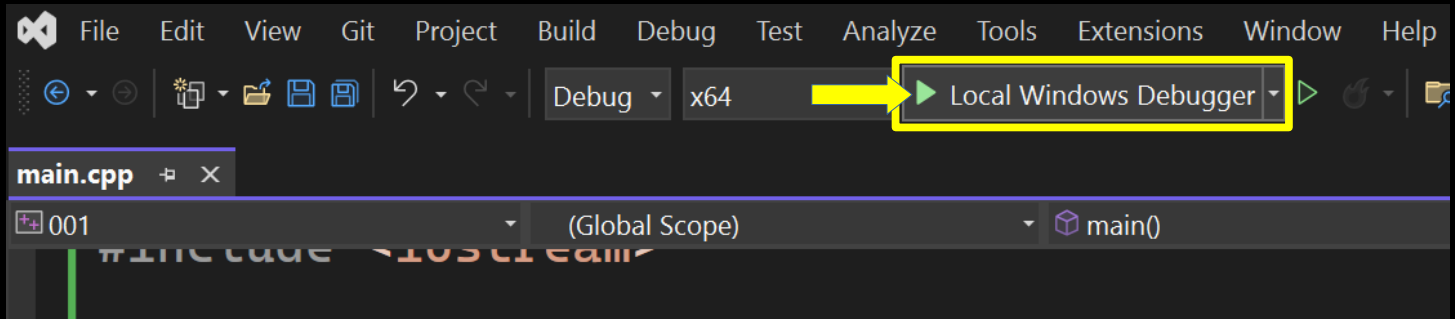
```
// main.cpp
```

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

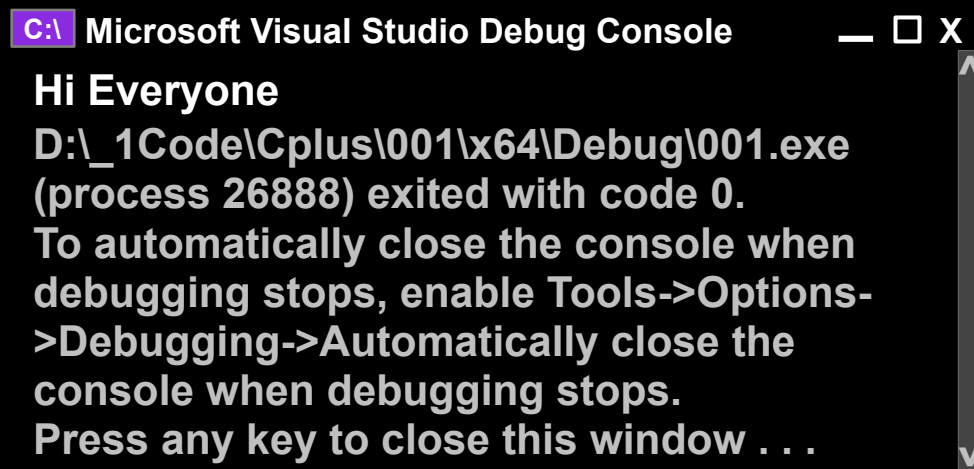
```
int main()  
{  
    cout << "Hi Everyone";  
  
    return 0;  
}
```

// 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

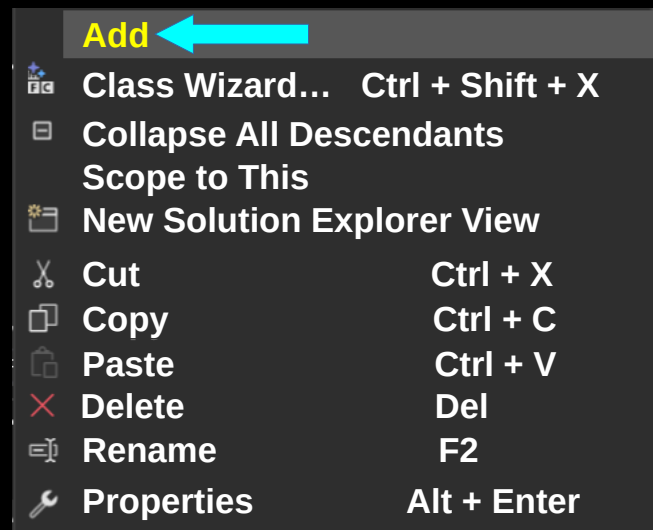
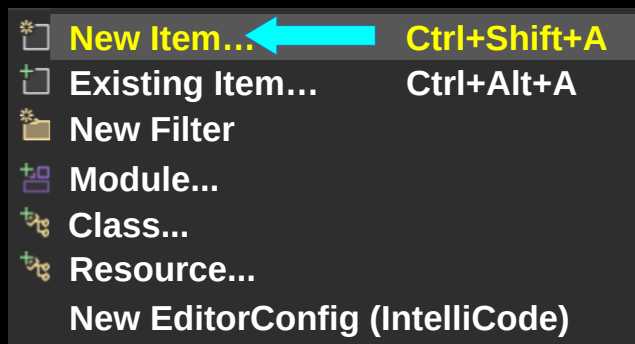
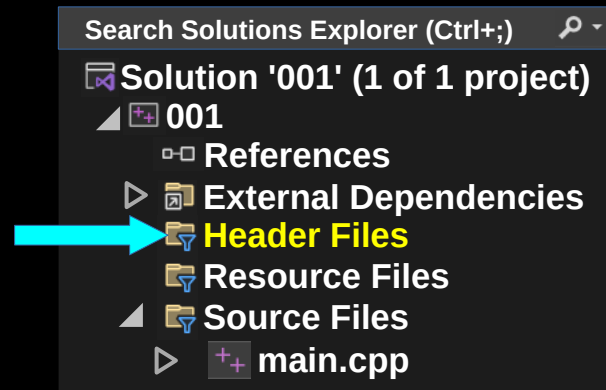
and

#define

to designate that it will be used in other files.

Header File - Add - New Item

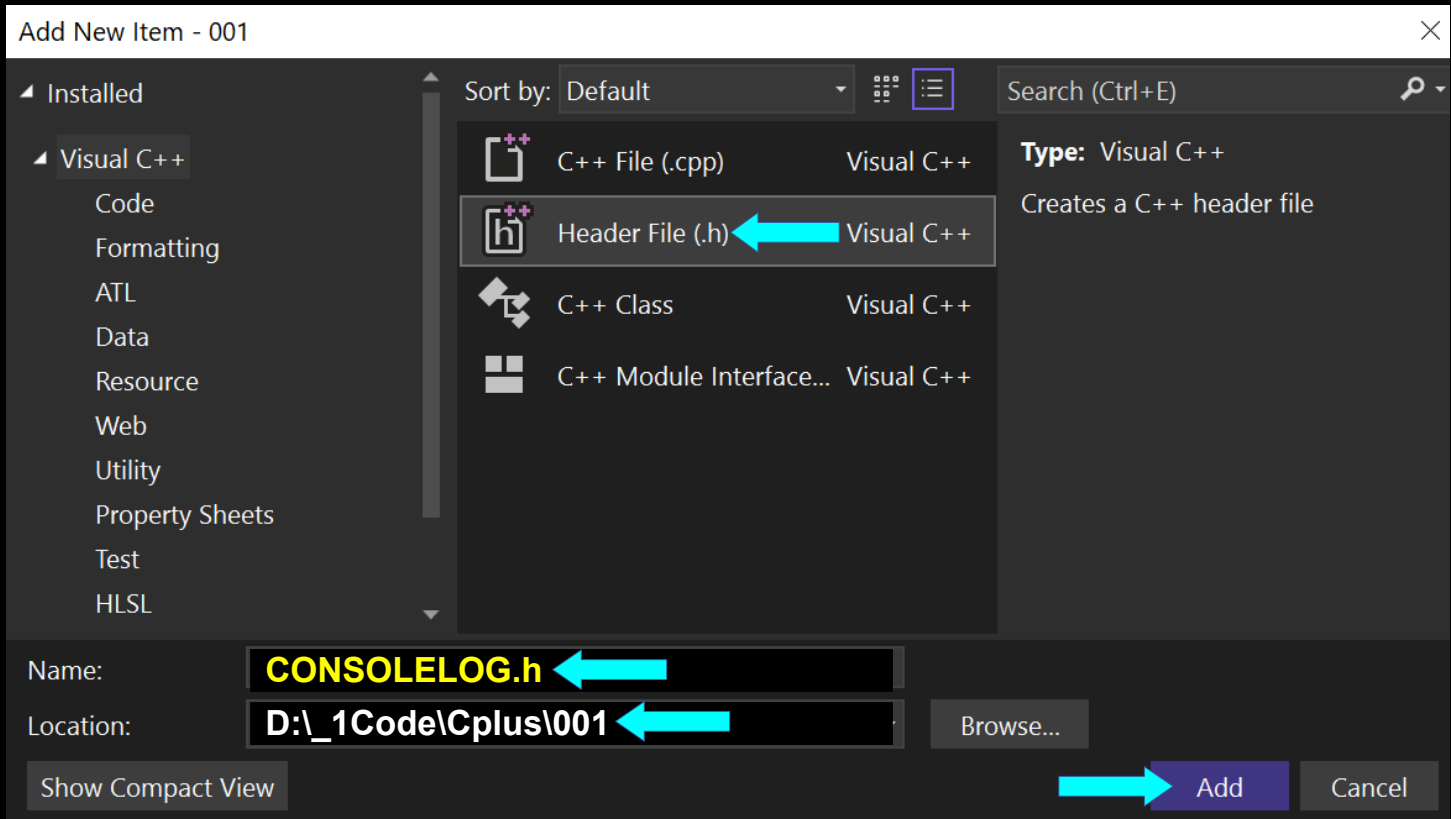
We right click on: **Header Files** folder



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;

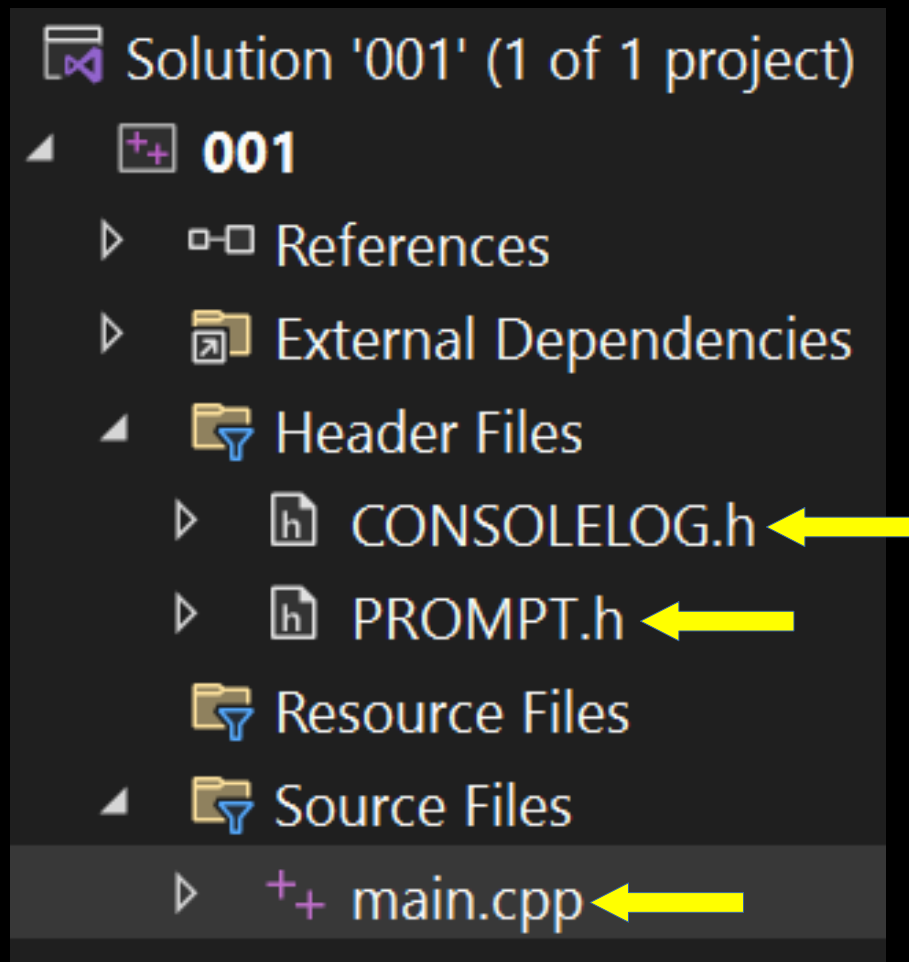
    consoleLog("Enter Name");
    prompt(input);

    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
        },
        {
```

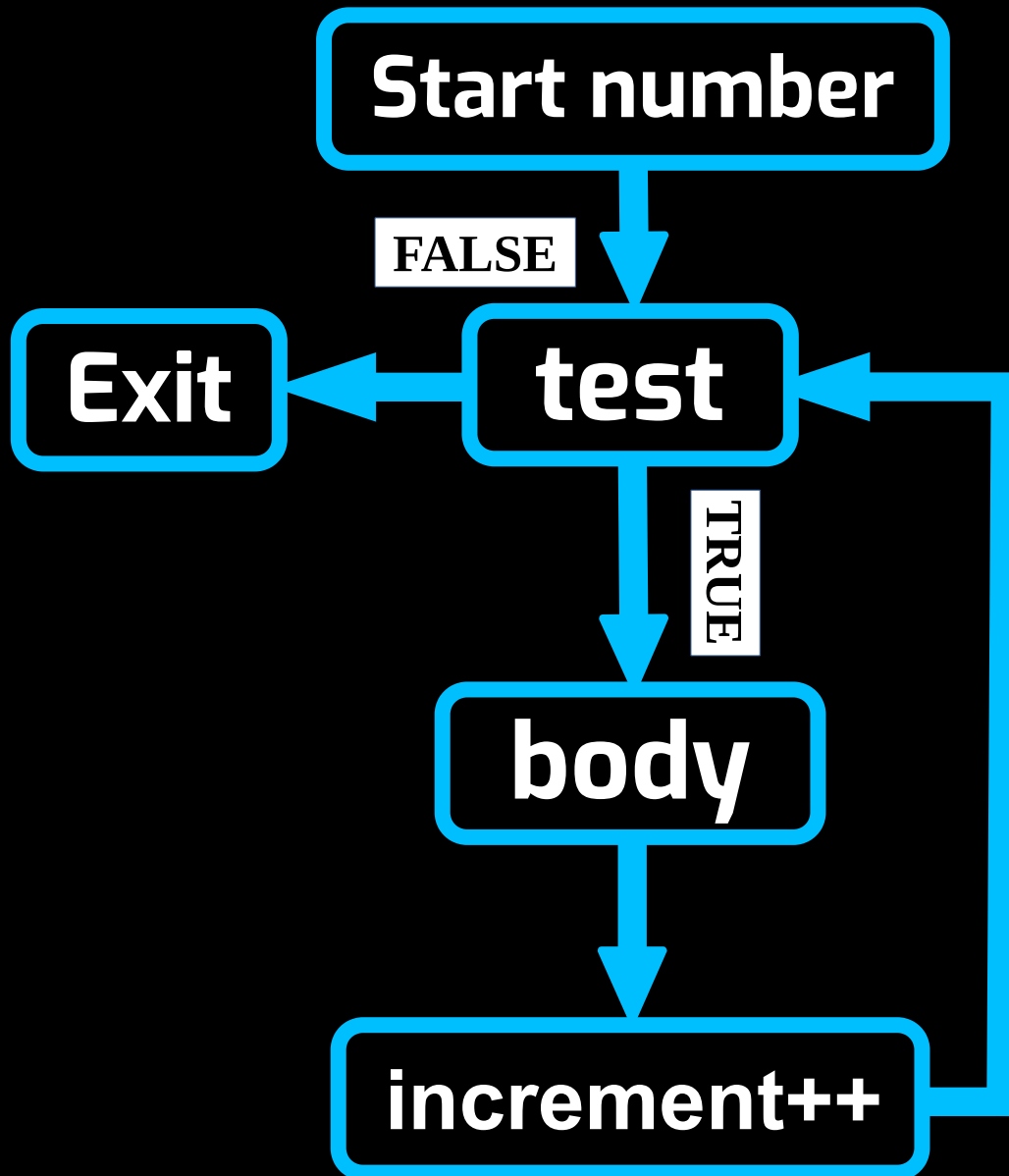
```
        "Bob",  
        30  
    },  
  
    {  
        "Jane",  
        28  
    }  
};
```

```
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



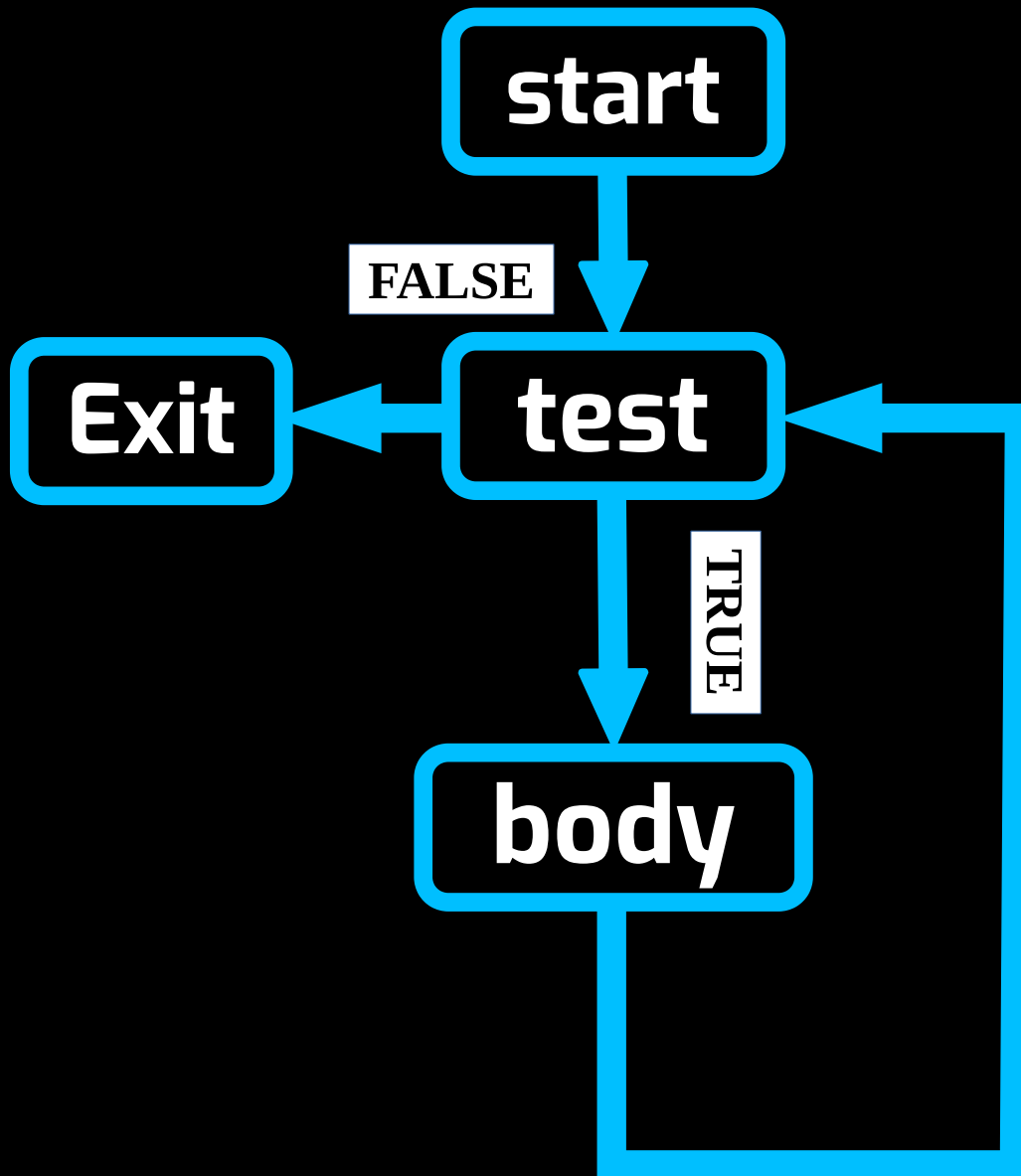
```
// for loop
```

```
// 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;  
}
```

// 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\Cplusplus\001\x64\Debug\001.exe

```
Enter your name: John  
Howdy John. Tell Chris to Sign in later.  
  
Press Enter to Exit_
```

C:\ D:_1Code\Cplusplus\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++;
}

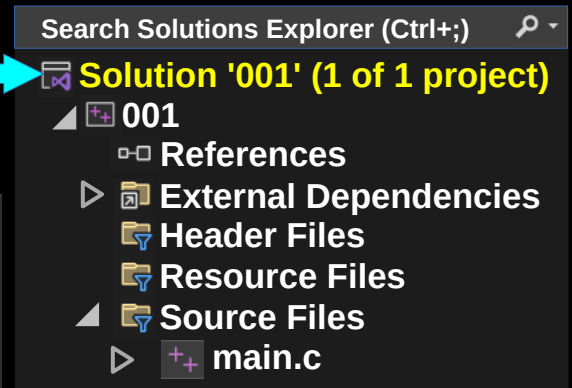
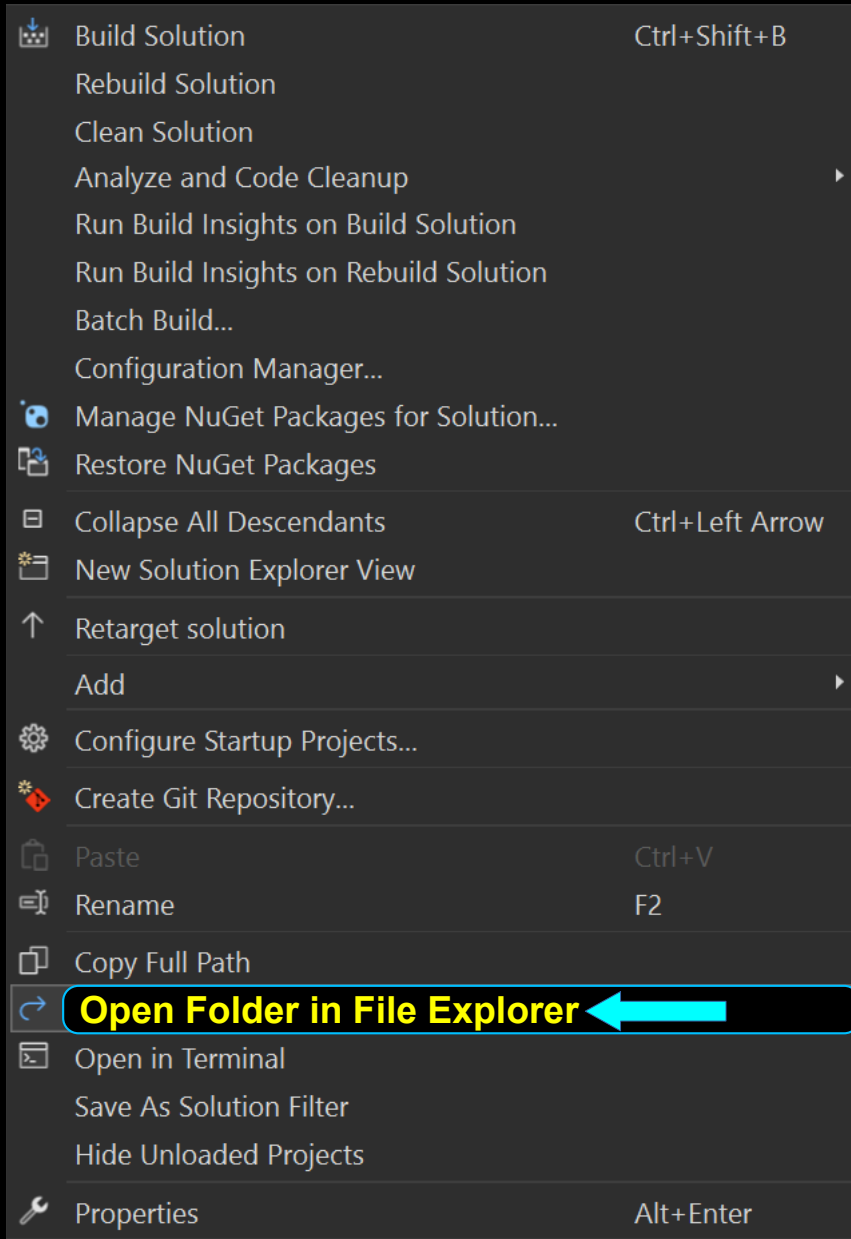
// close the file
inputFile.close();

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

return 0;
}
```

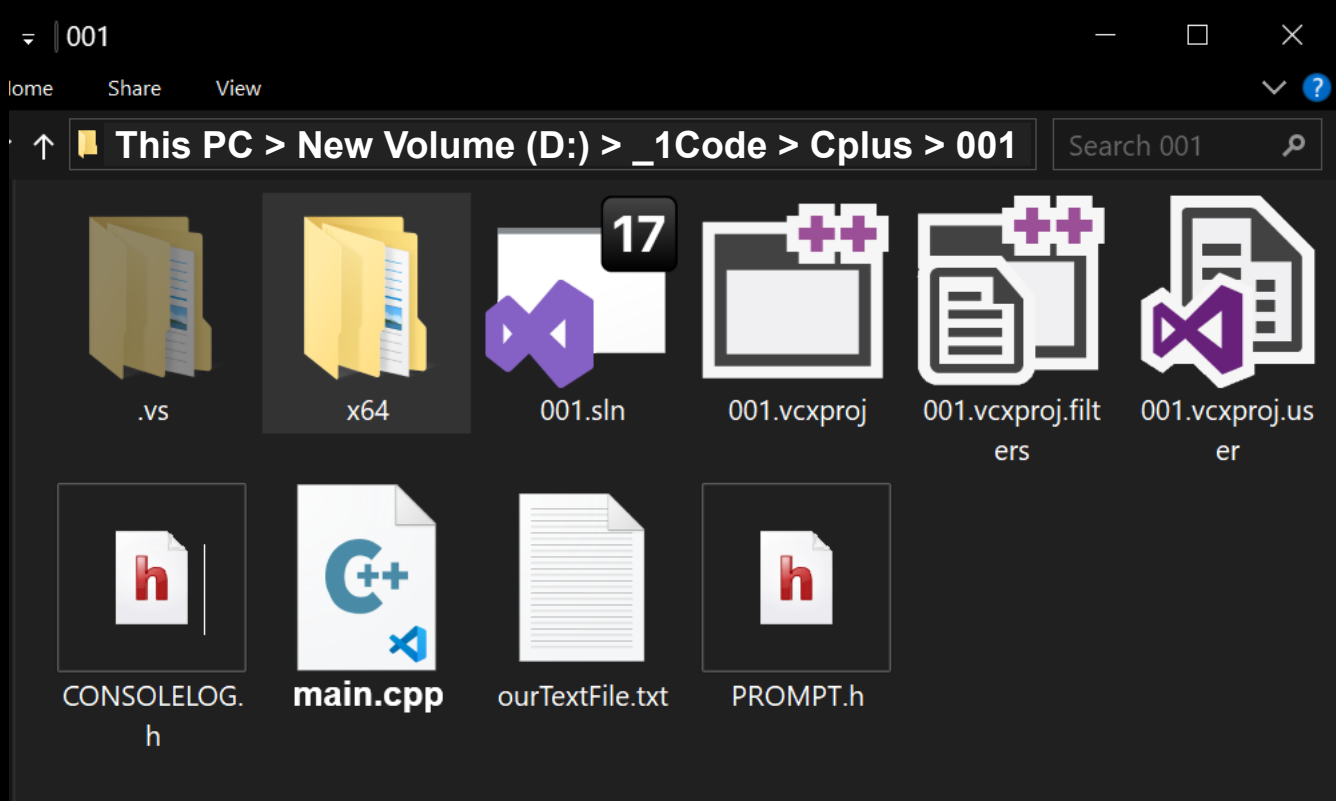
// How to Find Our Application .exe File

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

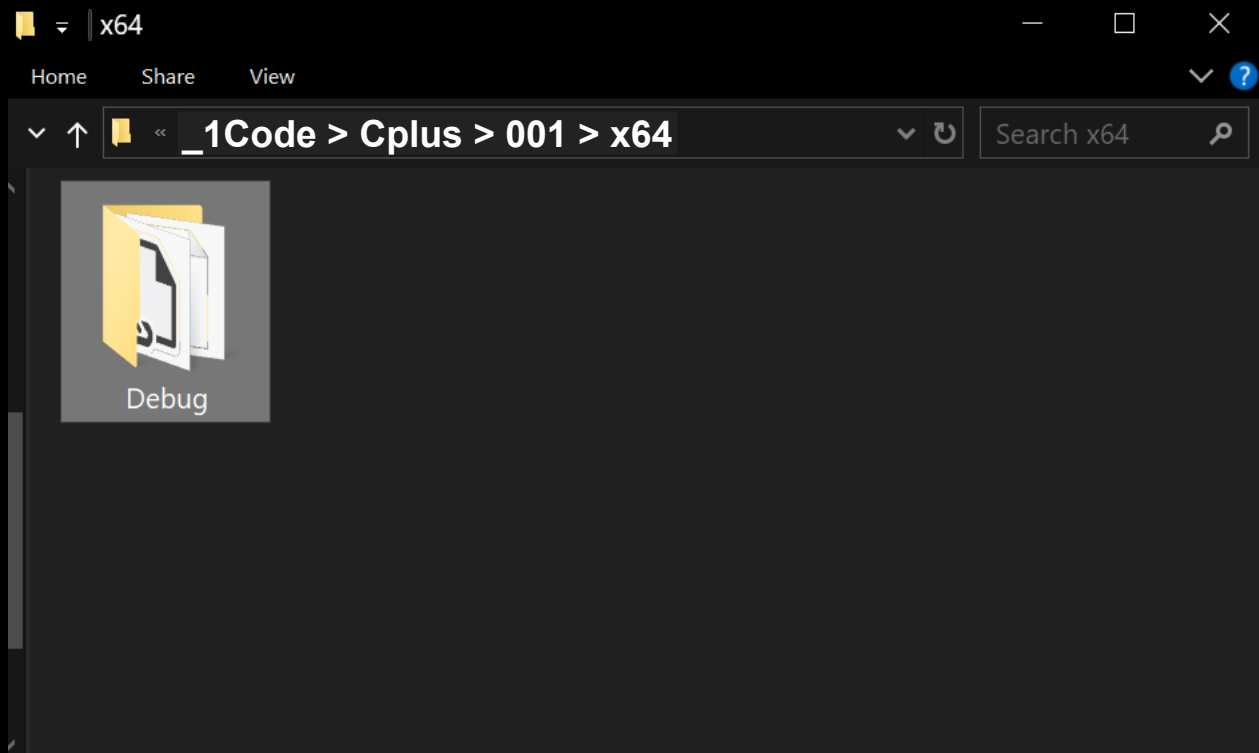


We Choose: **Open Folder in File Explorer**

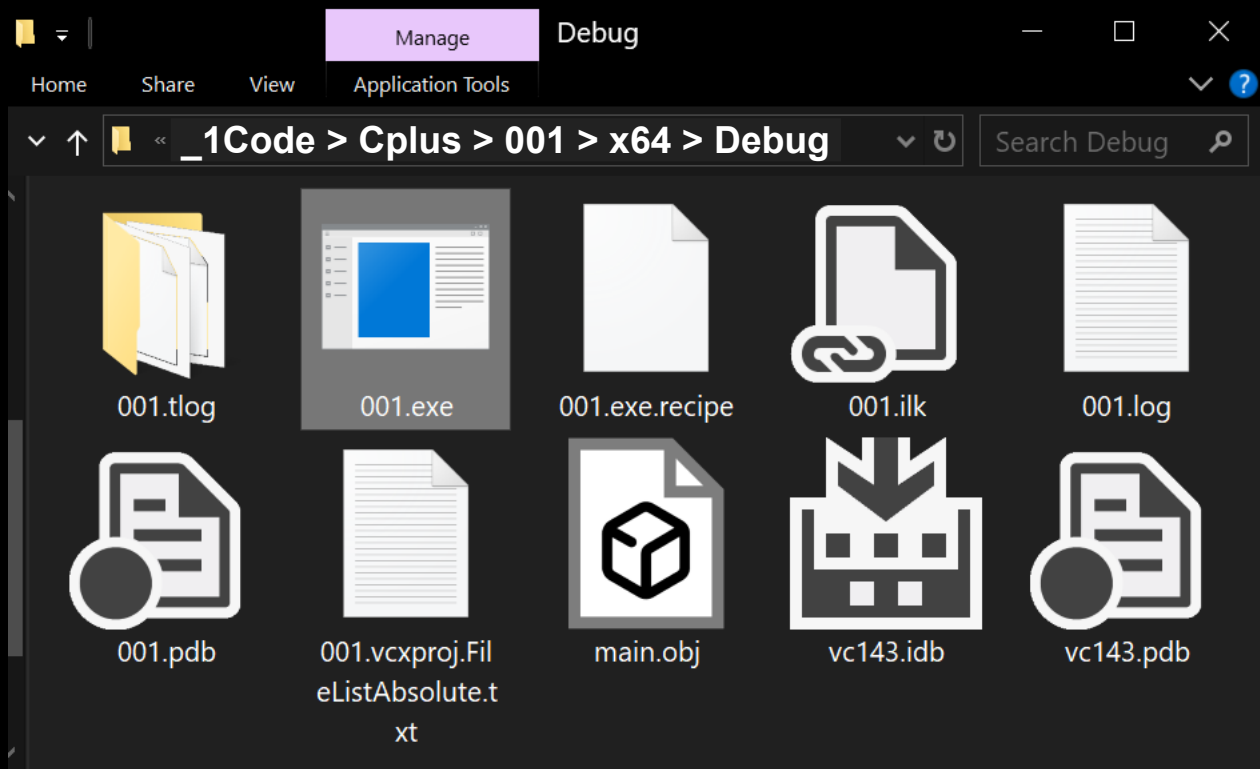
We see that our Project Folder has opened:



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\  
Cplusplus\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)
```

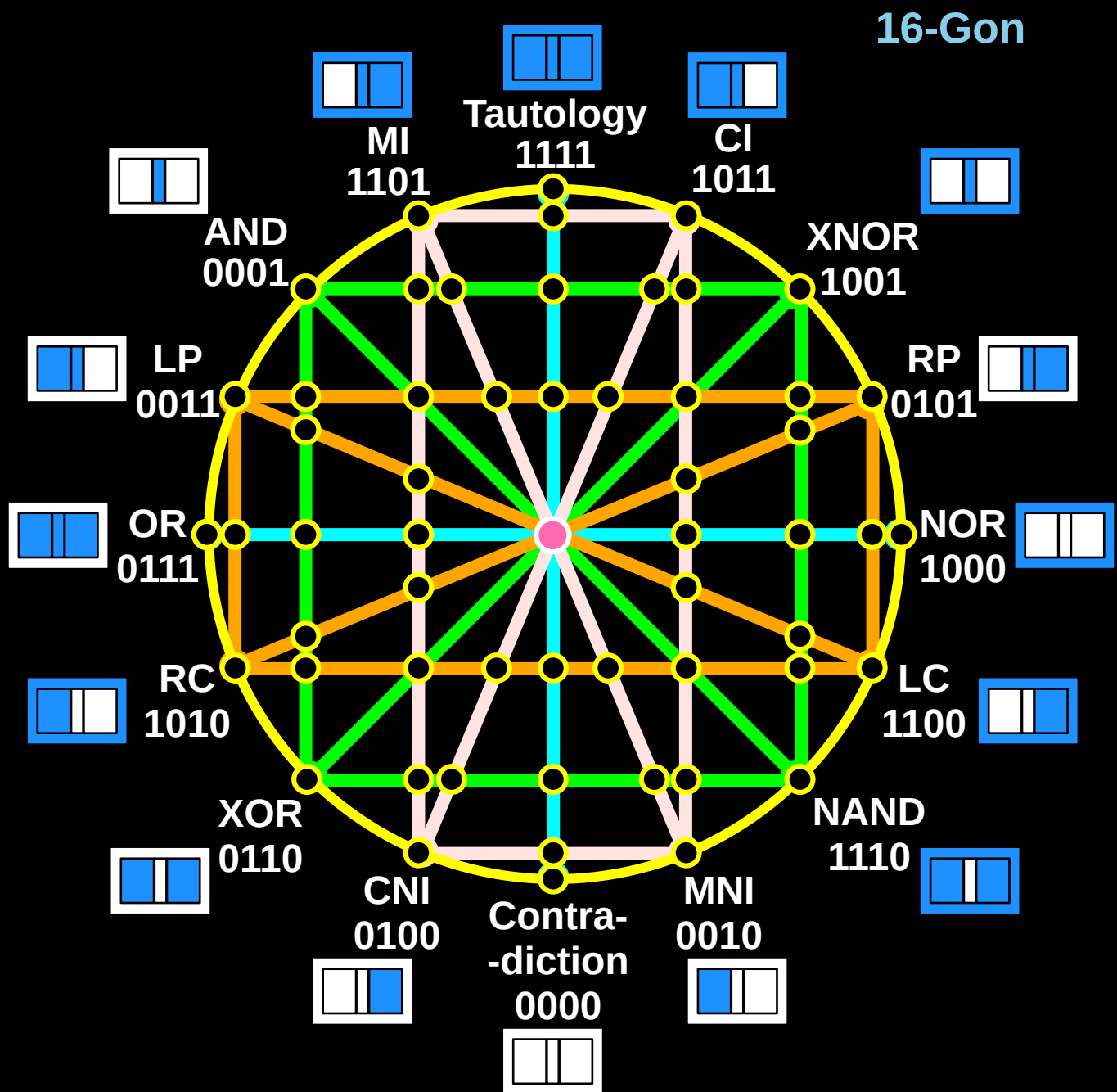
```
    {
        std::wcerr << L"Error getting Desktop
        path" << std::endl;
        return 1;
    }
```

```
    // 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;  
}
```

True Artificial Intelligence System



For More Tutorials:

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Dedicated to God the Father

This book is created by the
College of Scripting Music & Science.

Always remember, that each time you write a script with a pencil and paper, it becomes imprinted so deeply in memory that the material and methods are learned extremely well. When you Type the scripts, the same is true.

The more you type and write out the scripts by keyboard or pencil and paper, the more you will learn programming!

Write & Type EVERY example that you find. Keep all of your scripts organized. Every script that you create increases your programming abilities.

SEEING CODE, is one thing,
but WRITING CODE is another.
Write it, Type it, Speak It, See It, Dream It.

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