



Using Visual Studio 2022: Part 1

Dr. Yihsiang Liow

Objectives

The slide features a decorative header with five circles. The first circle is solid light purple and partially overlaps the word 'Objectives'. The second circle is an outline of a light purple circle. The third, fourth, and fifth circles are also outlines of light purple circles, spaced evenly across the top of the slide.

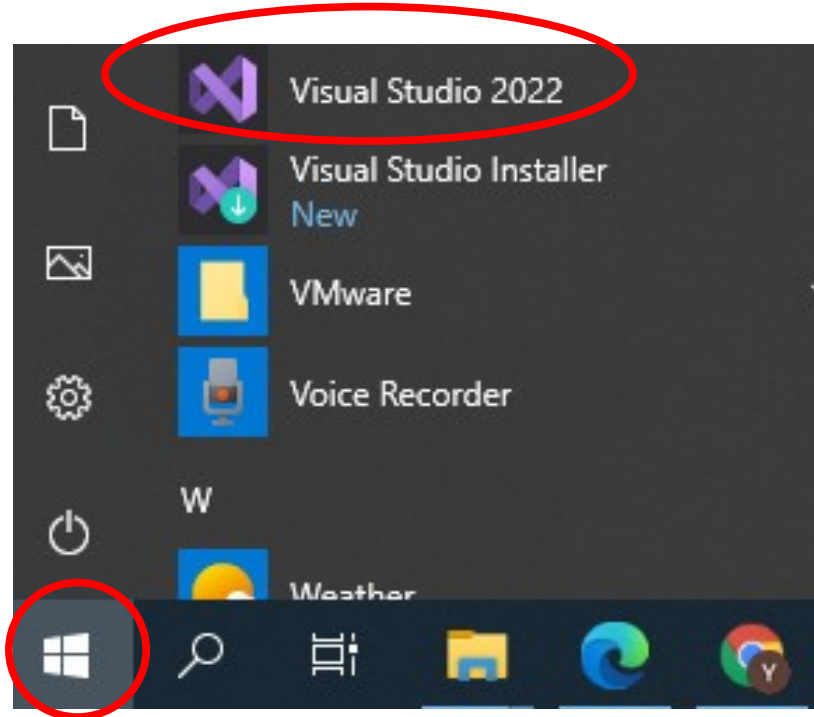
- Installation
- Start Microsoft Visual Studio 2022
- Create project
- Add C++ file
- Compile and run a program
- Disable MS Language Extensions
- Miscellaneous

Installation

- Go to <https://www.visualstudio.com/downloads/> and select the Community Edition.
- You will be asked to select the “payloads” or “workloads” -- choose “Desktop Development with C++” (you can choose others if you like, but for CISS240, Desktop Dev with C++ is enough.)

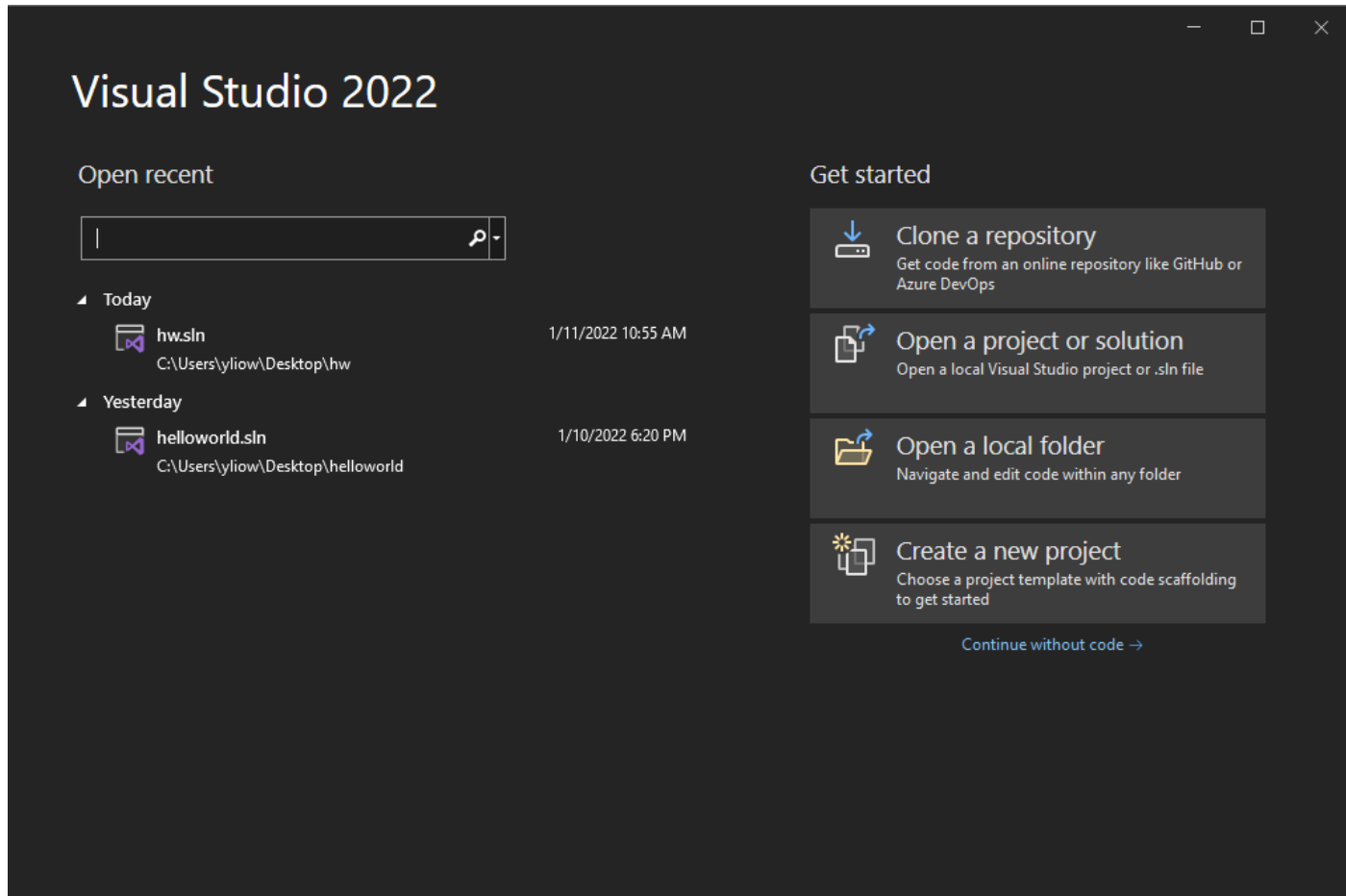
Start Studio 2022

- Fire up Visual Studio 2022:



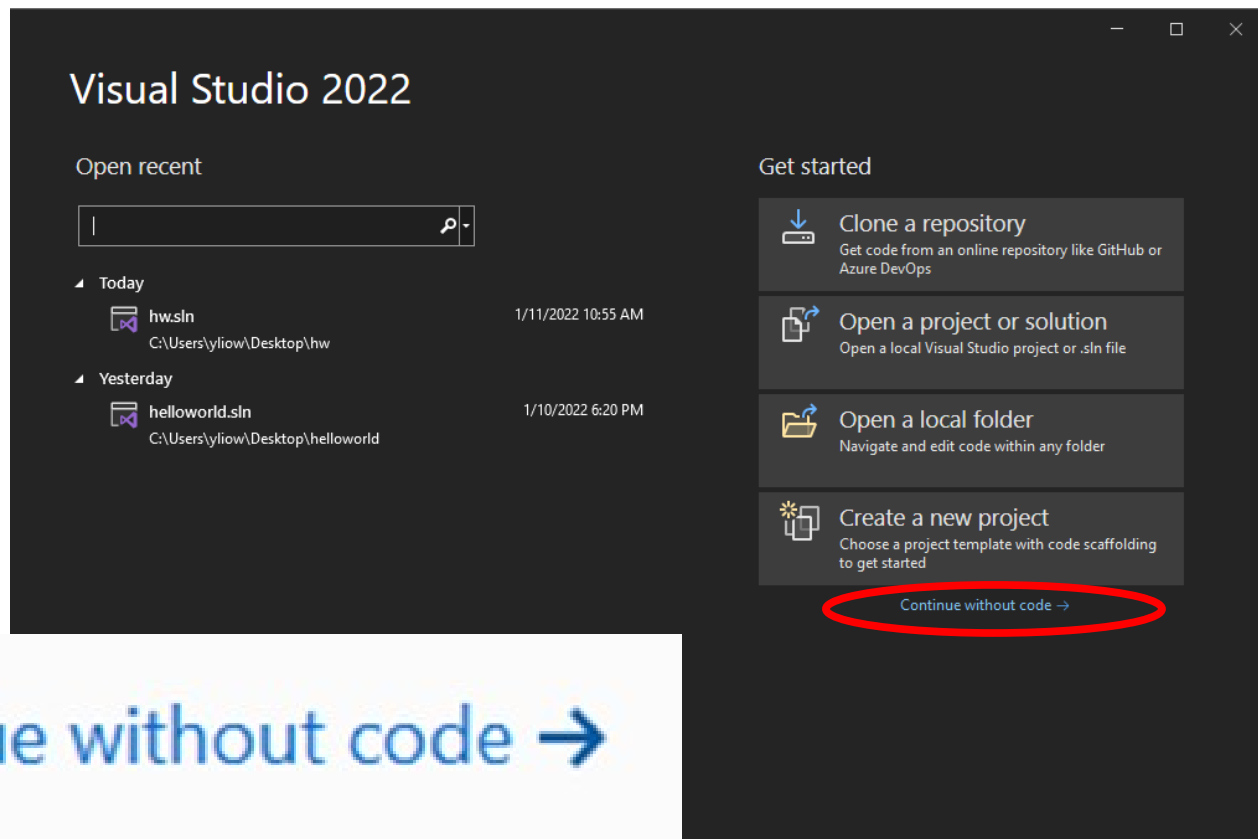
- You should get the following screen ...

Start Studio 2022



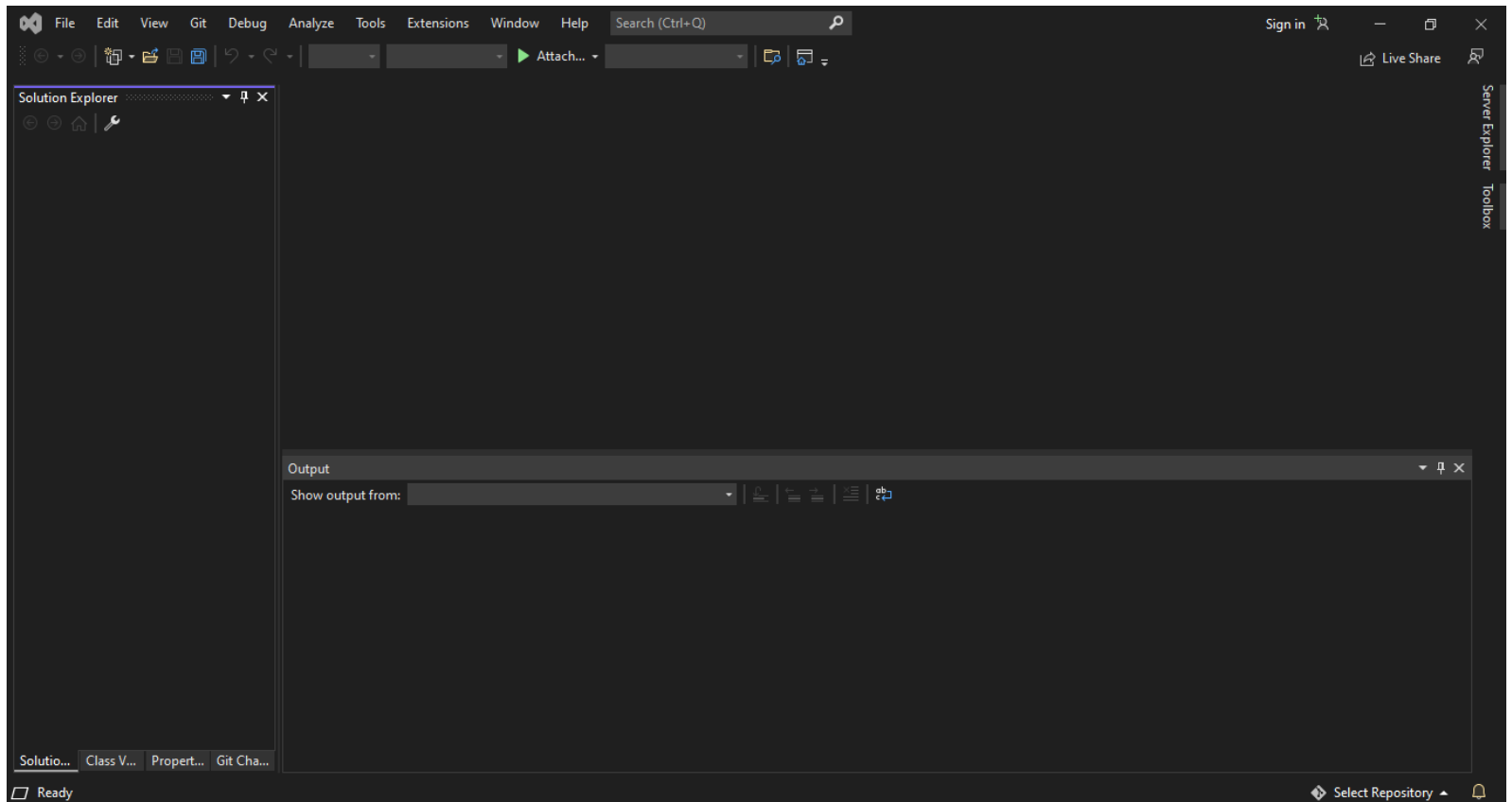
Start Studio 2022

- Click on this:



Start Studio 2022

● You get this:

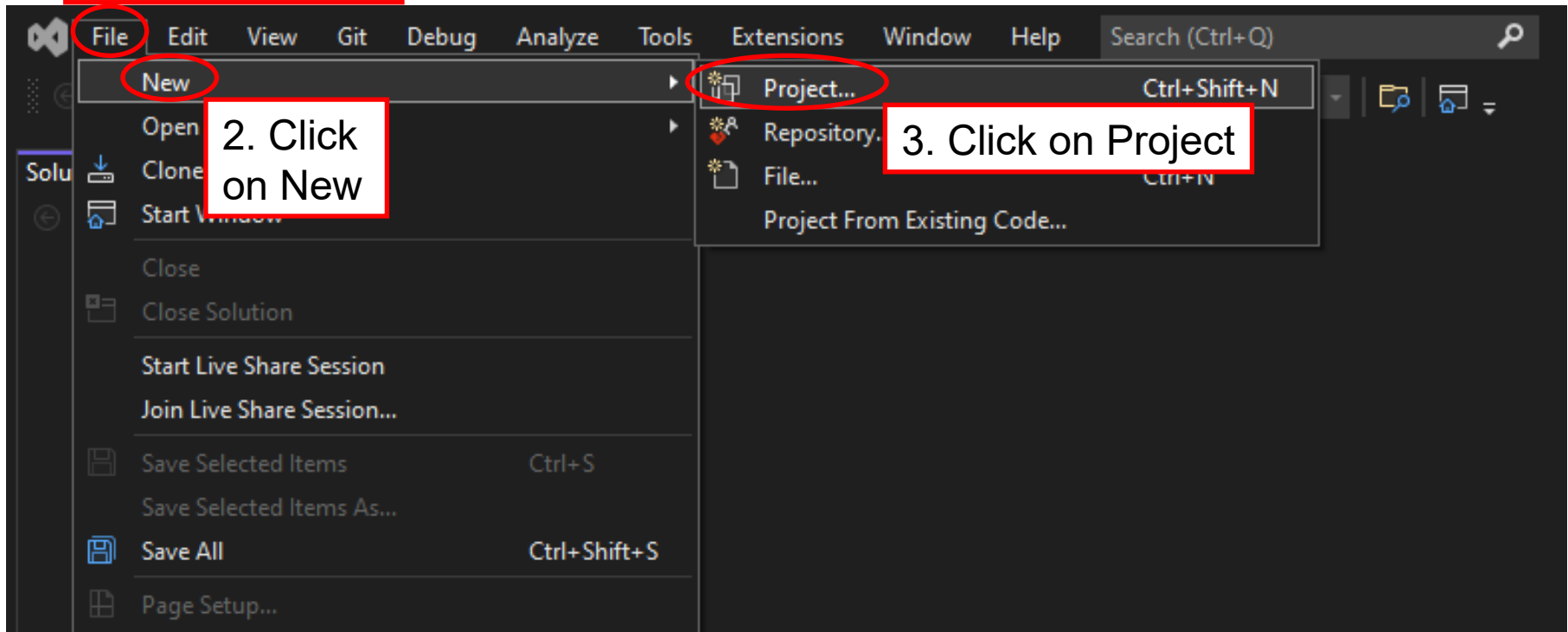


Creating New Project

- To write a program in Studio 2022, you need to
 - create a project
 - put your program (C++ source file) to the project.
- **Each program requires a new project.**
- Let's begin ...

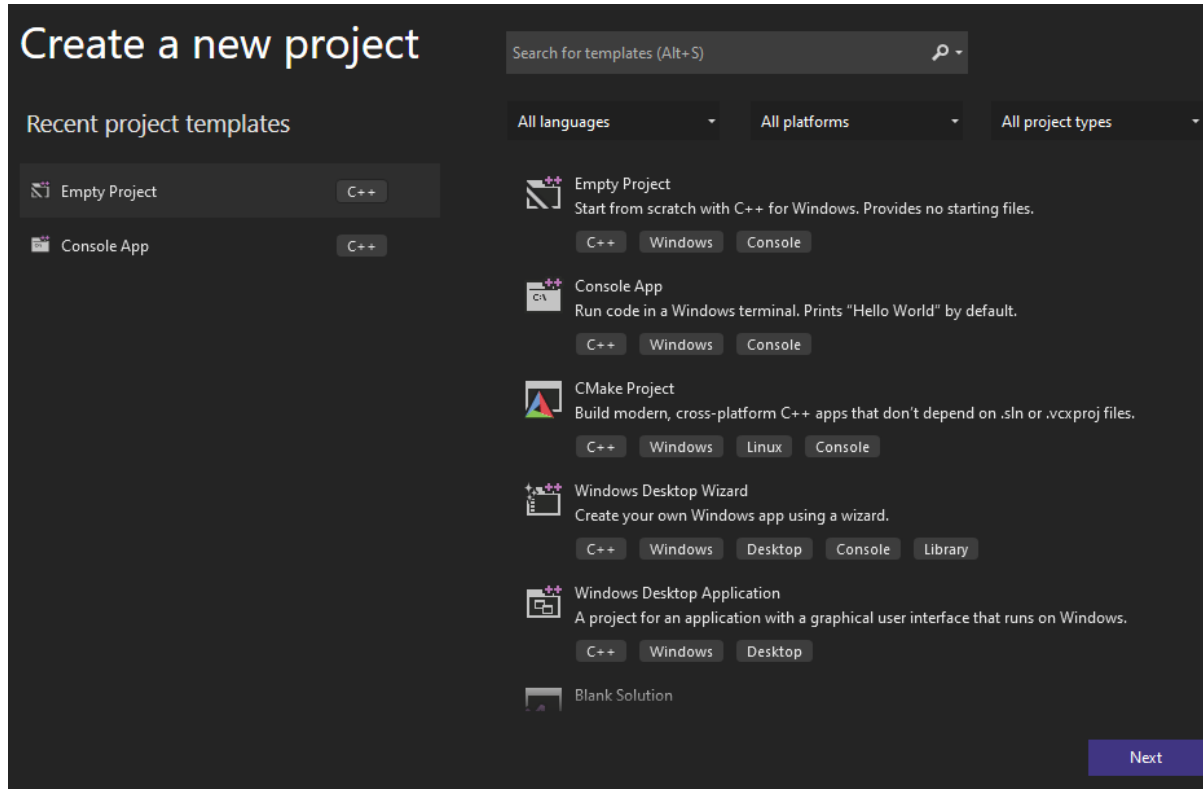
Creating New Project

1. Pull down File



Creating New Project

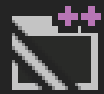
You should see this:



If you installed multiple languages instead of just C++, then you will also need to select C++, etc.

Creating New Project

Click on Empty Project



Empty Project

Start from scratch with C++ for Windows. Provides no starting files.

C++

Windows

Console

Creating New Project

Fill in the following

1. Enter a name for your project.
For this tutorial, I'll use helloworld.

Configure your new project

Empty Project C++ Windows Console

Project name
helloworld

Location
C:\Users\yliow\Desktop ...

Solution name ⓘ
helloworld

☐ Place solution and project in the same directory

Back Create

2. Click browse
to enter location
of project. I'll choose
My Desktop.

3. Click on Create

Creating New Project

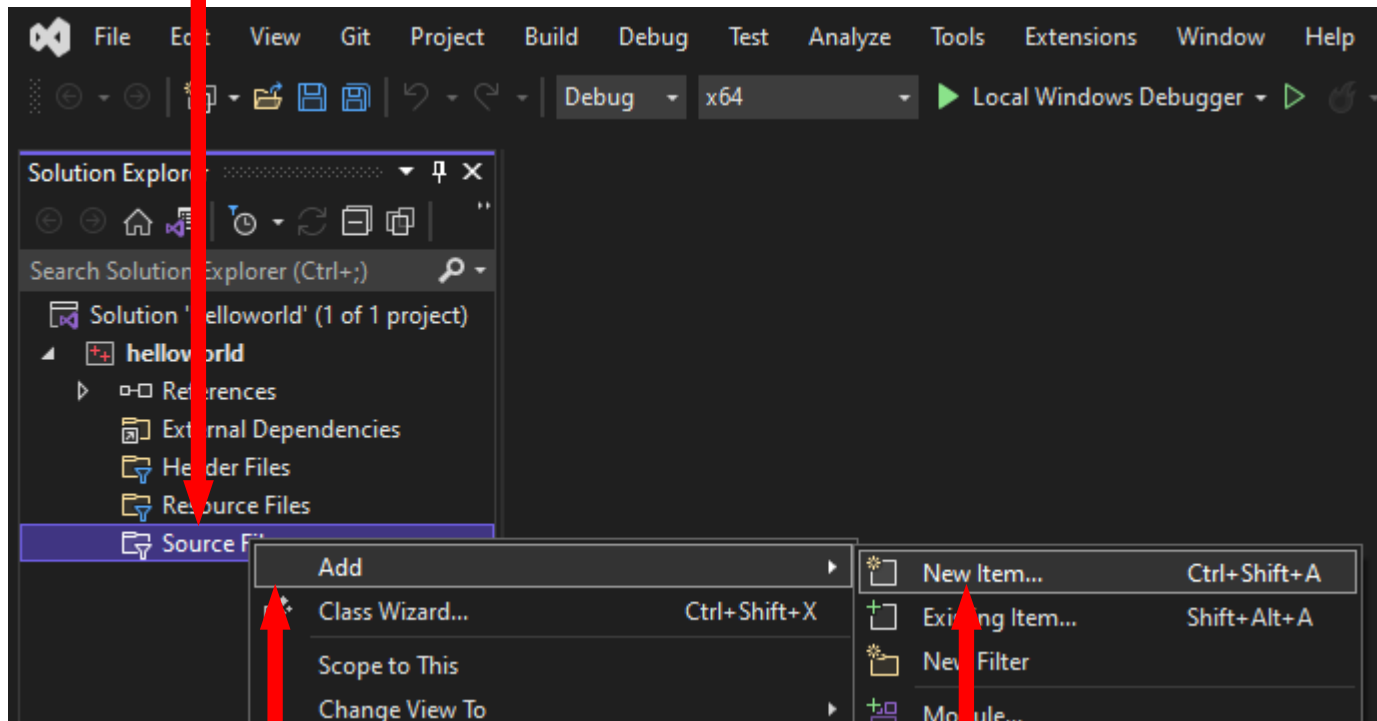
- Go to your Desktop and verify that there is a folder on your Desktop:



- The program you write will be in this folder.

Creating New Project

1. Right-click Source Files



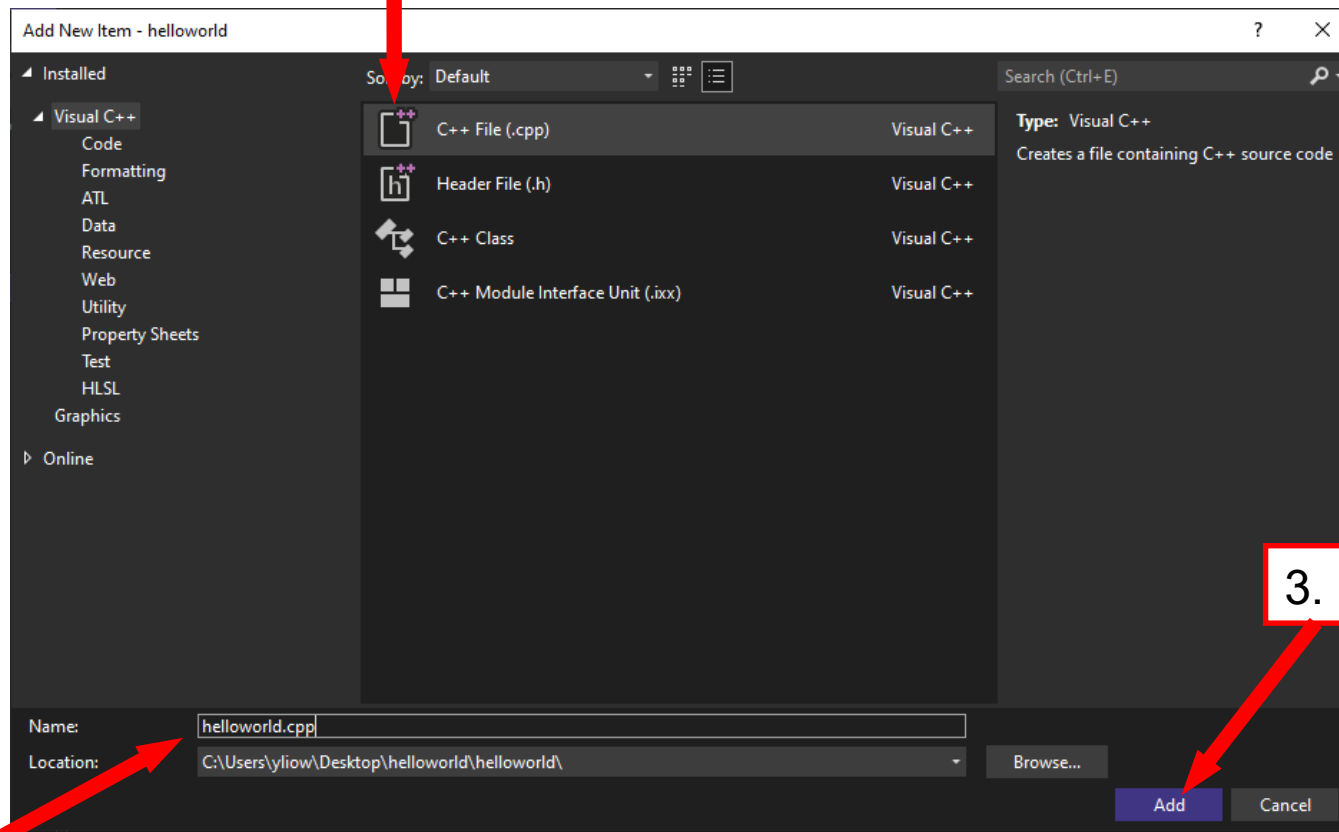
2. Click on Add

3. Click on New Item

Add C++ Source File to Project

You should see this:

1. Select C++ File (.cpp)

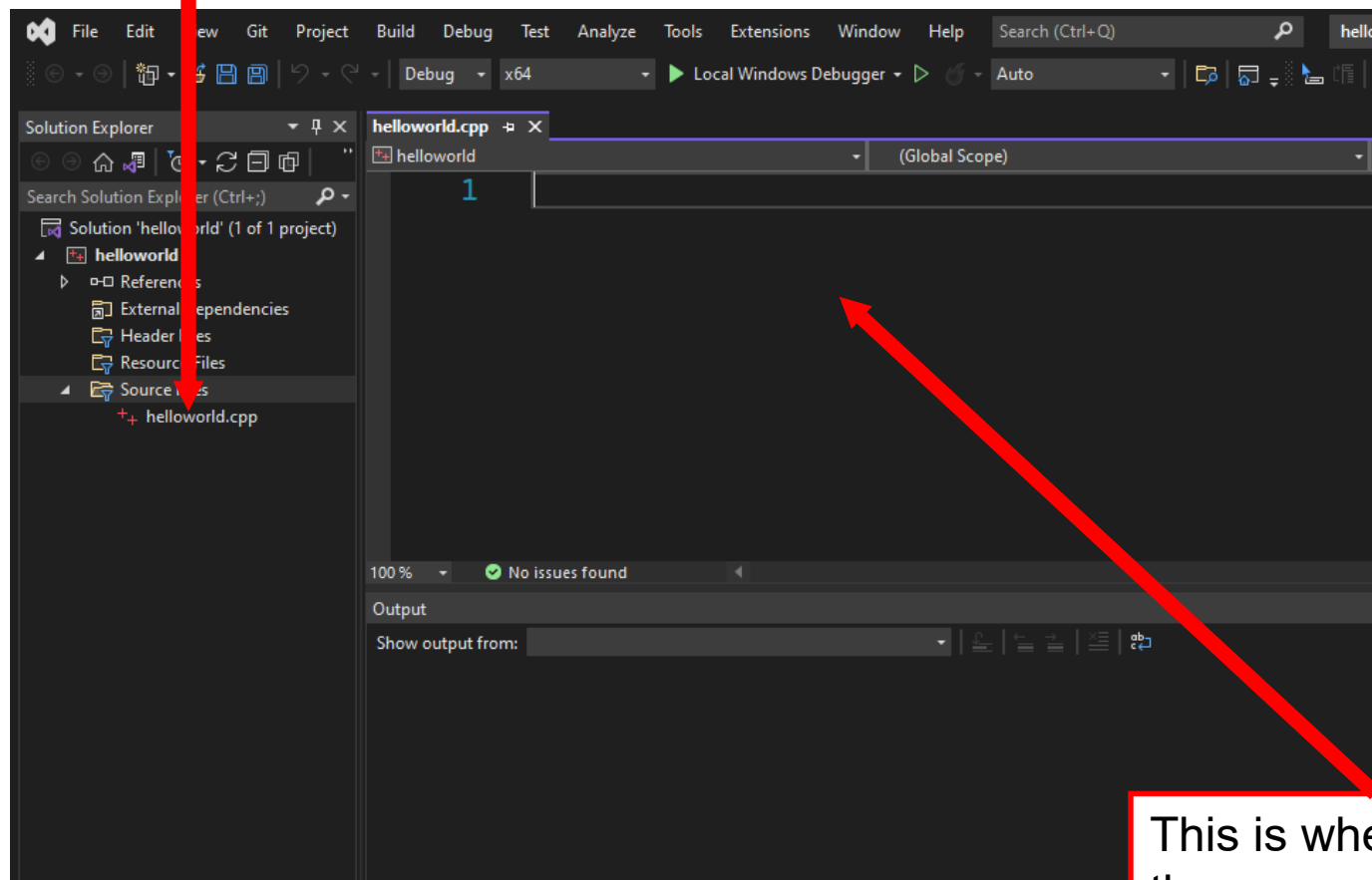


3. Click on Add

2. Enter a name for your C++ file. IT MUST END WITH .cpp!!! I'll use helloworld.cpp

Add C++ Source File to Project

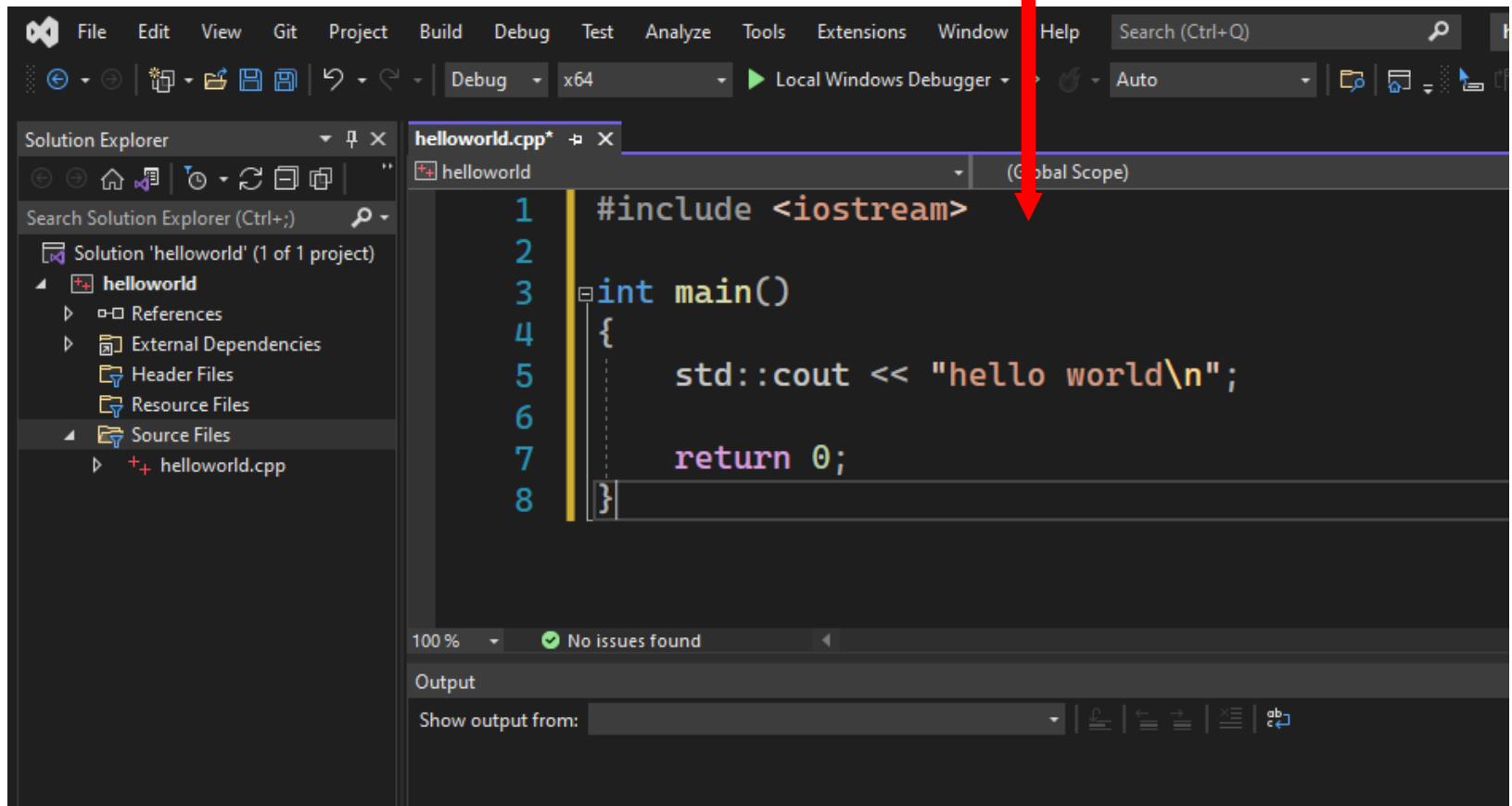
You've just created a blank program (source) file called `helloworld.cpp`.



This is where you enter the program.

Entering Program

Type in the following program



The screenshot shows the Visual Studio 2022 interface. The Solution Explorer on the left displays a project named 'helloworld' with a source file 'helloworld.cpp'. The code editor shows the following C++ code:

```
1  #include <iostream>
2
3  int main()
4  {
5      std::cout << "hello world\n";
6
7      return 0;
8  }
```

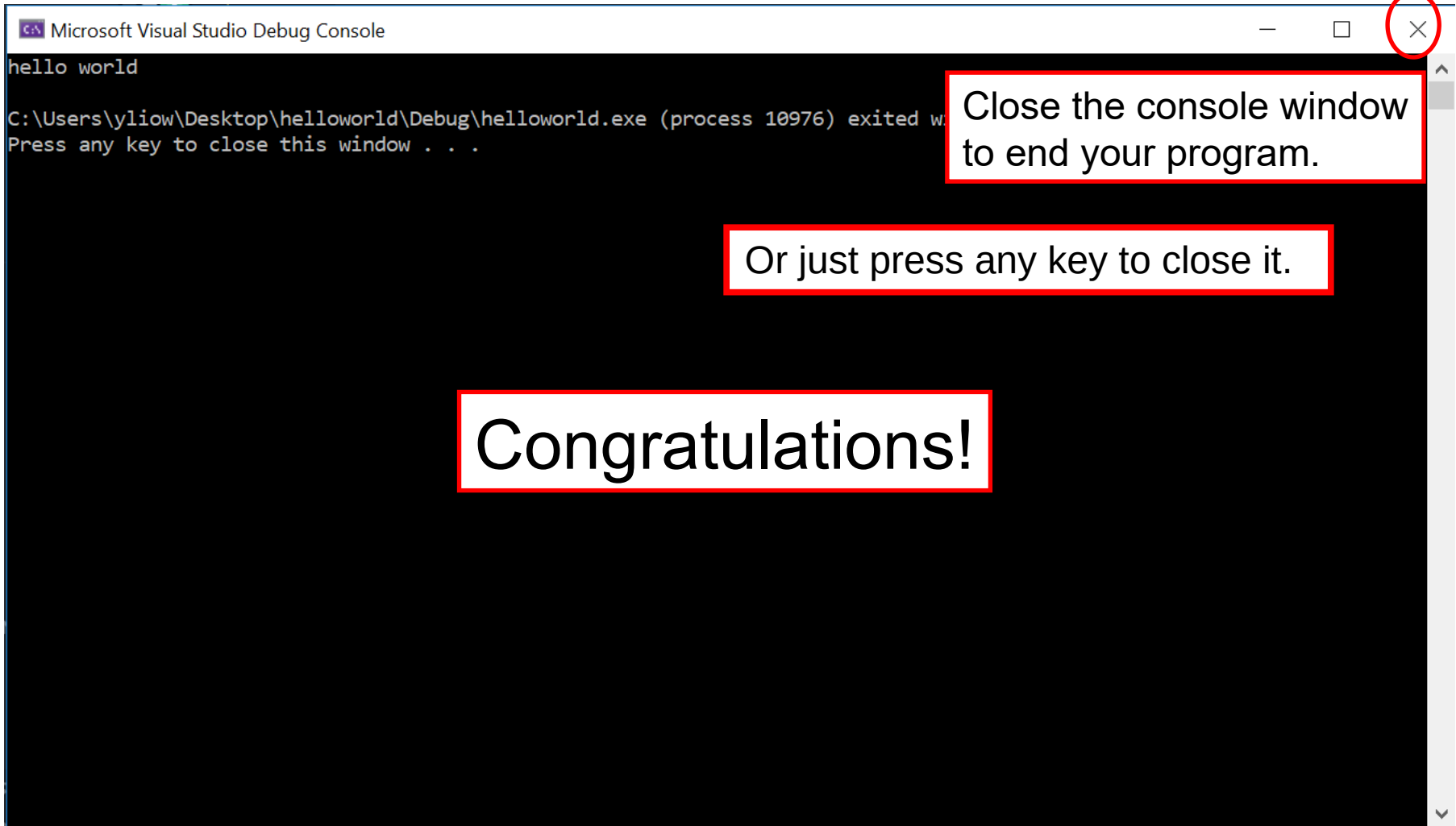
A red arrow points from the text 'Type in the following program' to the code editor. The status bar at the bottom indicates '100 %' and 'No issues found'.

Compiling and Running the Program

Now do Ctrl-F5 to compile and run your program

Compiling and Running the Program

You should see this console window:



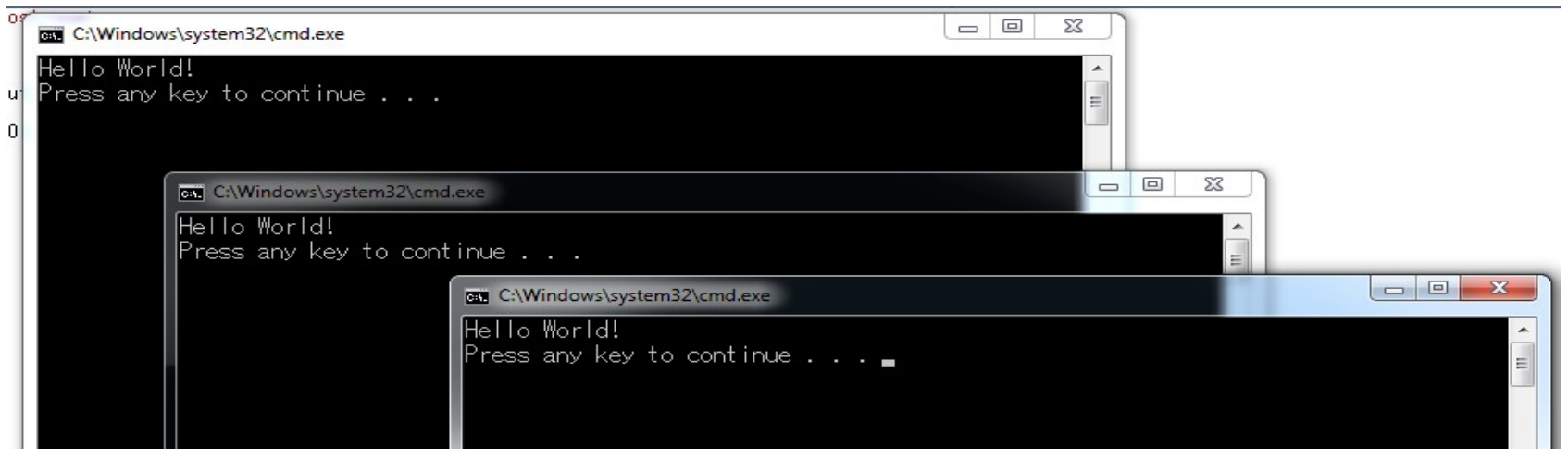
The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads 'Microsoft Visual Studio Debug Console'. The console output is as follows:

```
hello world  
C:\Users\yliow\Desktop\helloworld\Debug\helloworld.exe (process 10976) exited w  
Press any key to close this window . . .
```

Three red boxes with white text provide instructions:

- A box at the top right points to the close button (X) in the window's title bar, with the text: "Close the console window to end your program."
- A box in the middle right contains the text: "Or just press any key to close it."
- A large box at the bottom center contains the text: "Congratulations!"

WARNING to the Trigger Happy



When you have too many console windows you might run into an error. SO ... close useless console windows!!!



“Press any key to continue”

- Extra line printed: Press any key to continue.
- When you press any key, the window closes.
- **Listen very carefully:** The two effects
 - Printing “Press any key to continue” to the console window
 - Waiting for keypress to close the console window are commands added by Visual Studio 2022.



“Press any key to continue”

- Without these extra commands, the program would print hello world, the program ends, and the console window closes.
- Visual Studio 2022 gives you an opportunity to see the output.
- But remember: These two things were not due to your program.



Project Name and cpp Name

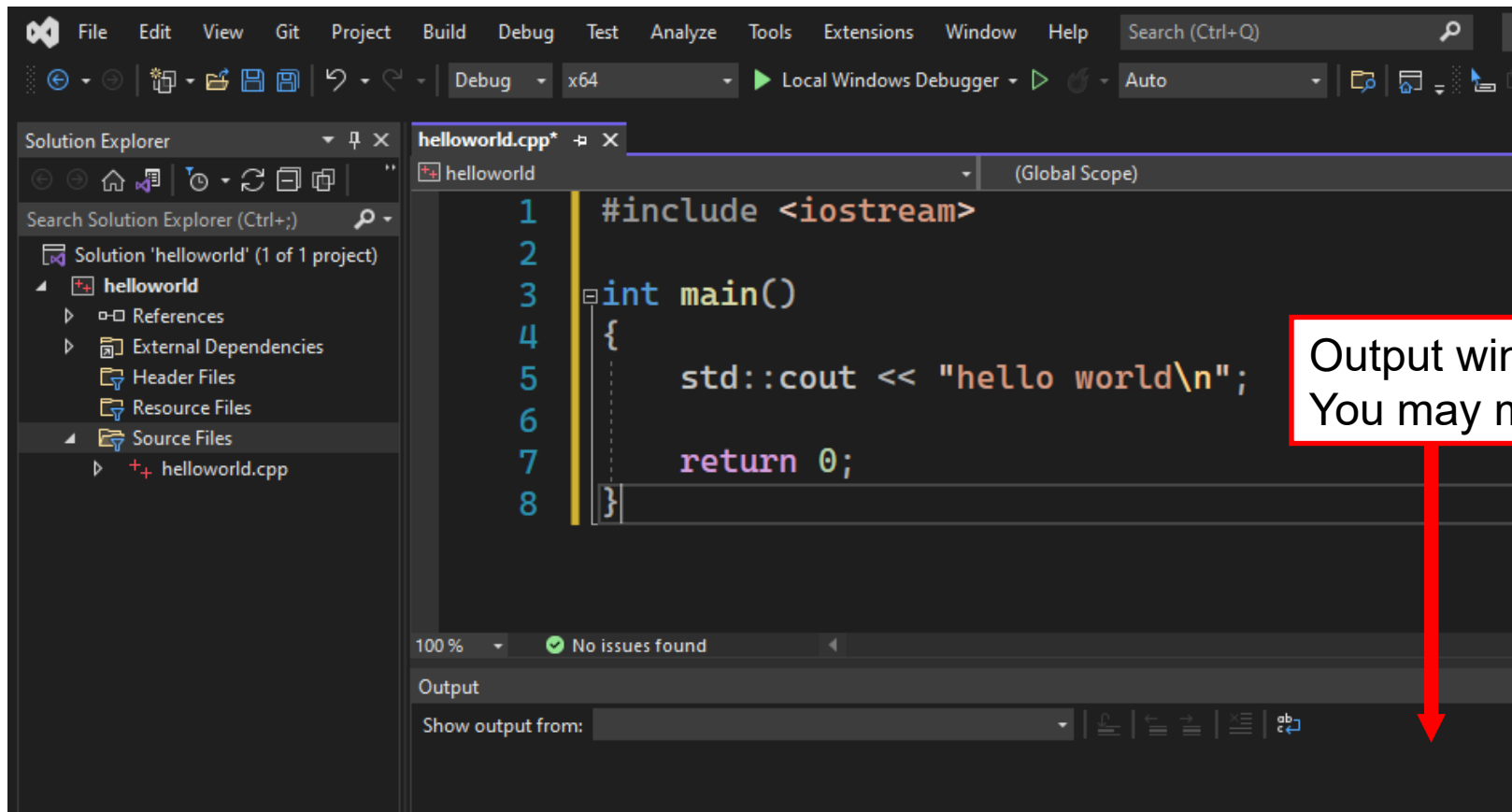
- Project name can be different from cpp source file name

Debugging

The slide features a decorative header with six circles. The first circle is solid light purple and partially overlaps the word 'Debugging'. The second circle is white with a light purple outline. The third circle is solid light purple. The fourth circle is white with a light purple outline. The fifth circle is solid light purple.

- Debugging = getting rid of “bugs” (i.e. errors) in your program
- Visual Studio 2022 can help you find some errors in your program

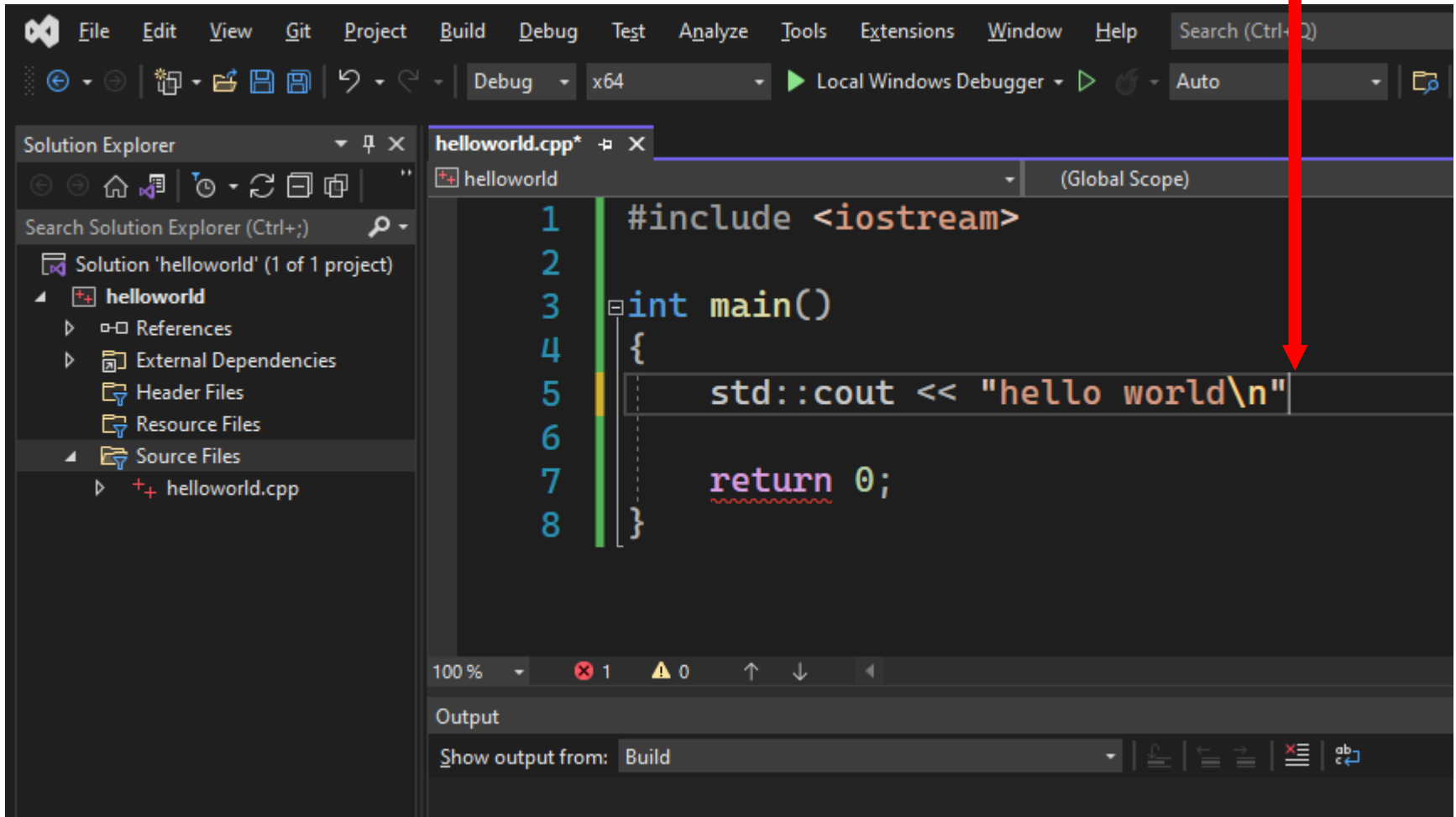
Debugging



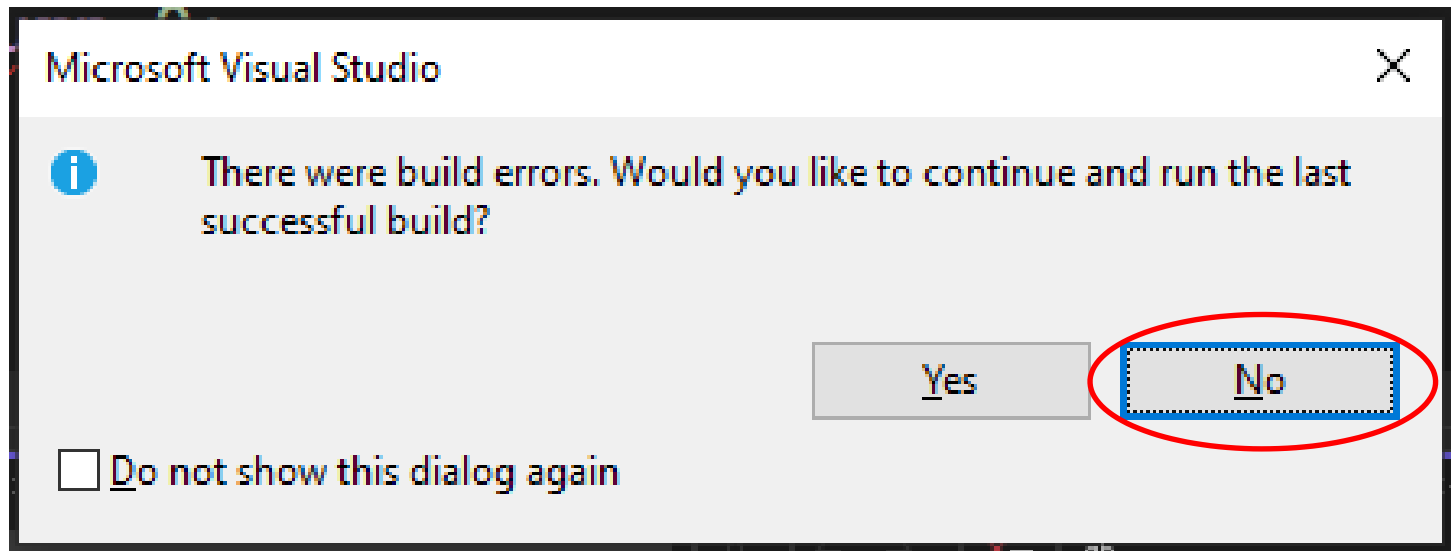
Debugging

Make the following changes to your program: remove the first semicolon ;

Ctrl-F5 again

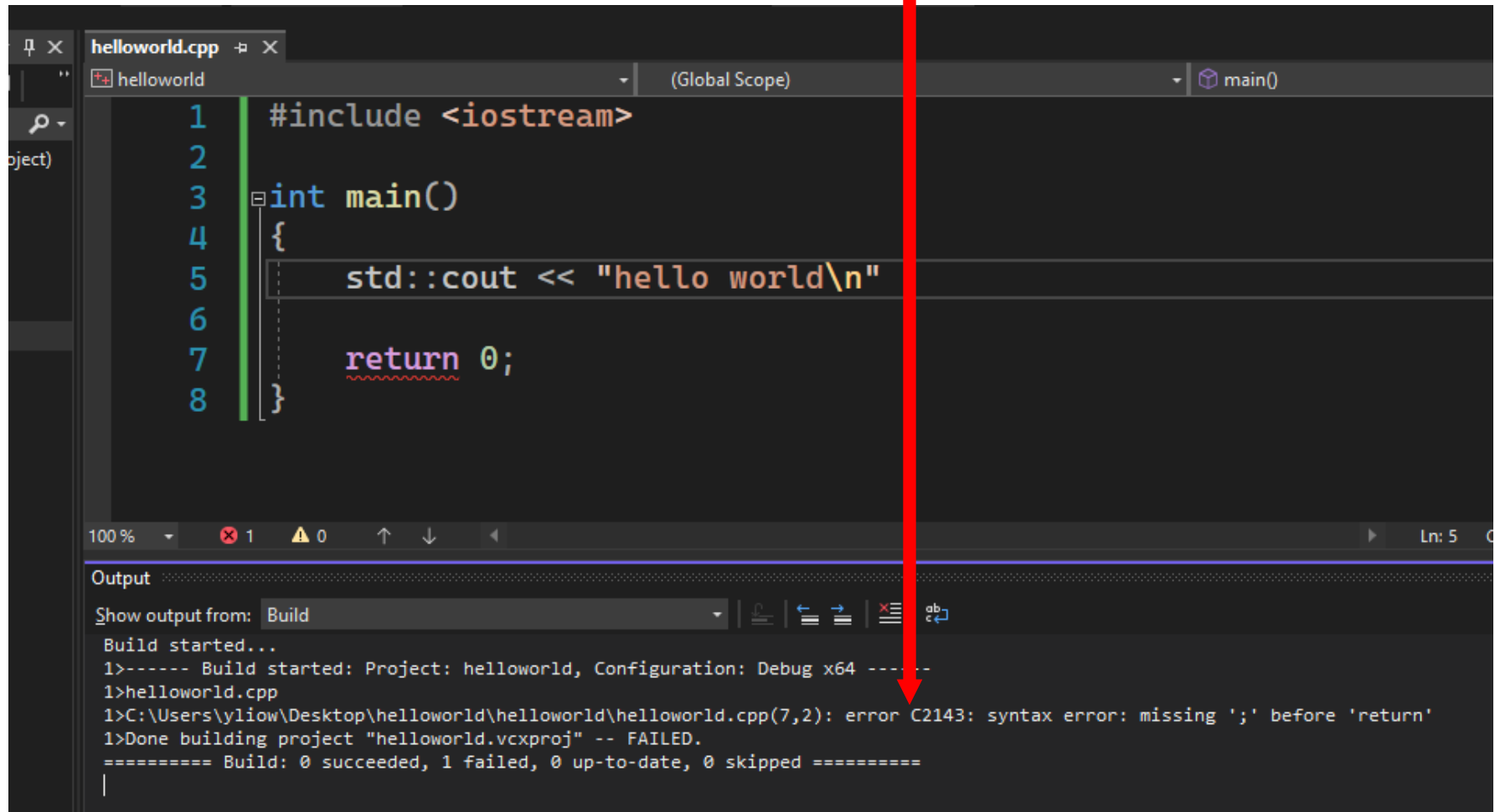


Debugging



Debugging

error C2143: syntax error : missing ';' before 'return'



```
1  #include <iostream>
2
3  int main()
4  {
5      std::cout << "hello world\n"
6
7      return 0;
8  }
```

Output

Show output from: Build

Build started...

1>----- Build started: Project: helloworld, Configuration: Debug x64 -----

1>helloworld.cpp

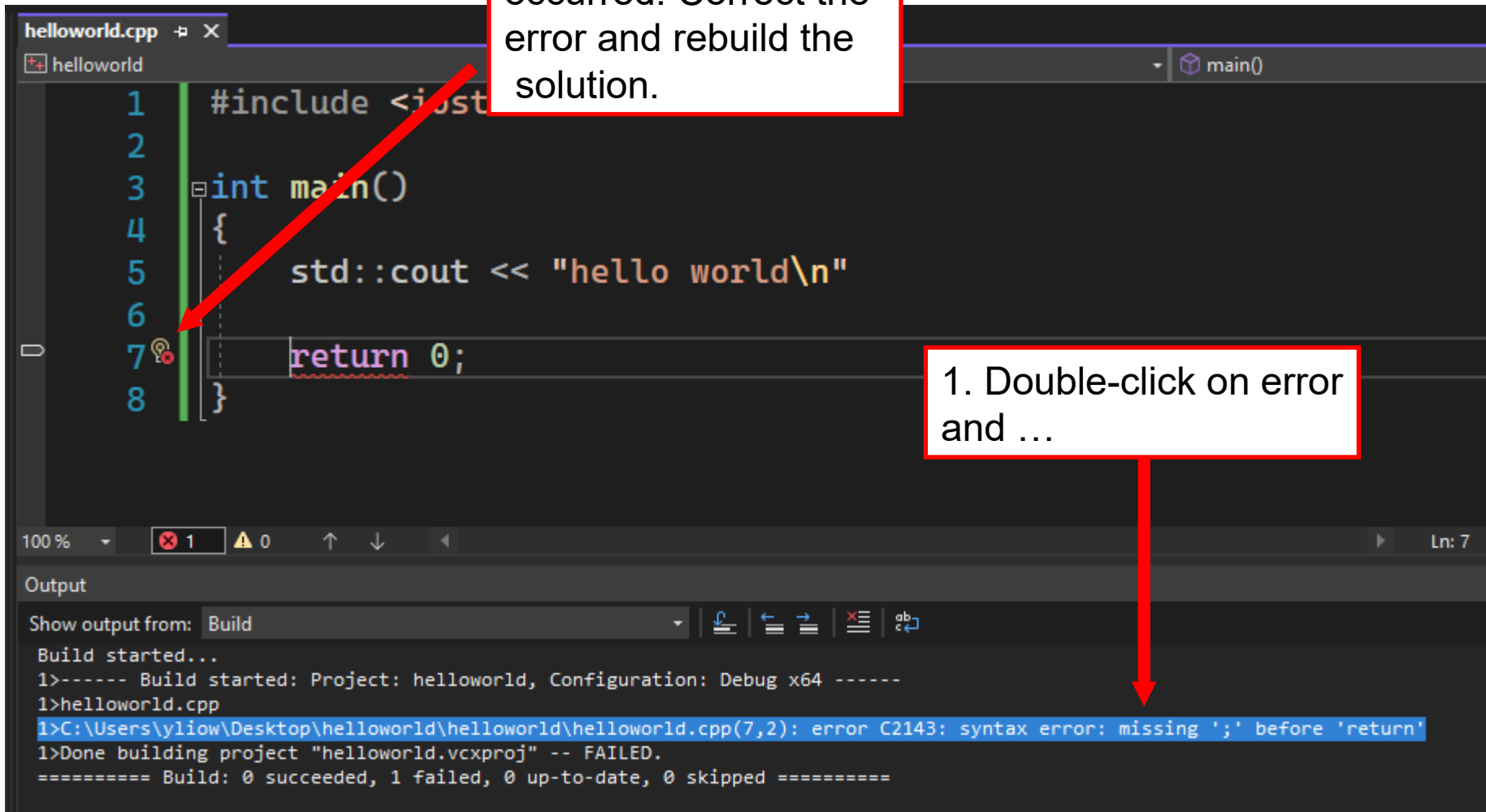
1>C:\Users\yliow\Desktop\helloworld\helloworld\helloworld.cpp(7,2): error C2143: syntax error: missing ';' before 'return'

1>Done building project "helloworld.vcxproj" -- FAILED.

===== Build: 0 succeeded, 1 failed, 0 up-to-date, 0 skipped =====

Debugging

2. ... the cursor jumps to approximately the place where the error occurred. Correct the error and rebuild the solution.



1. Double-click on error and ...

Debugging



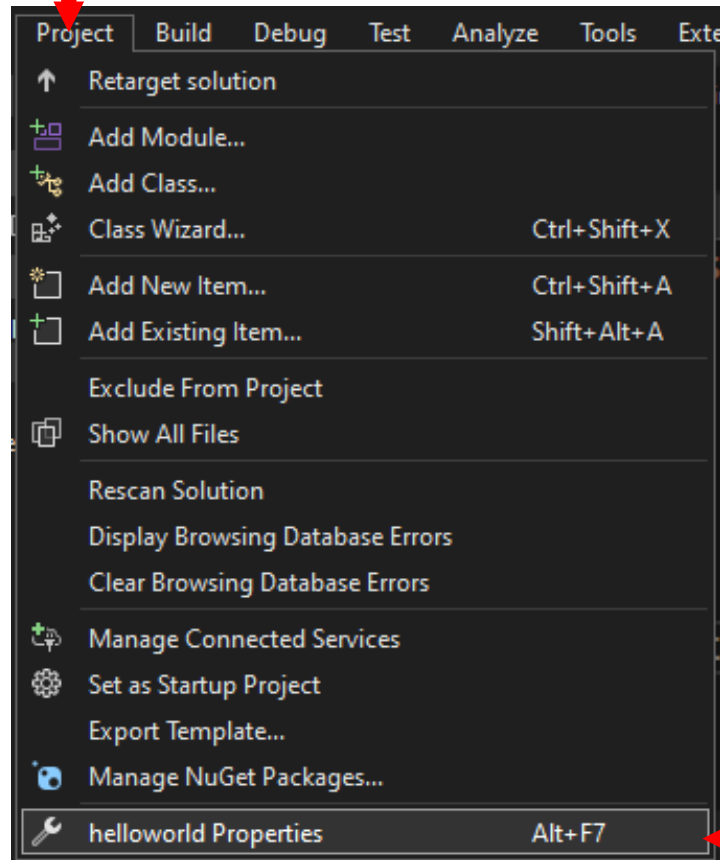
- The error message is sometimes helpful in finding the error.
- The error pointer points to (only) roughly the place when the error occurs. You usually have to analyze the code before the pointer.
- If you have multiple errors, always fix the first error before fixing the second.

Disable Language Extensions

- The next step is **very important!**
- You must modify your project property so that Visual Studio 2019 works “correctly”
- Open your project’s property. You can do this in *two* ways; see next slide. (The second method on the right is recommended.)

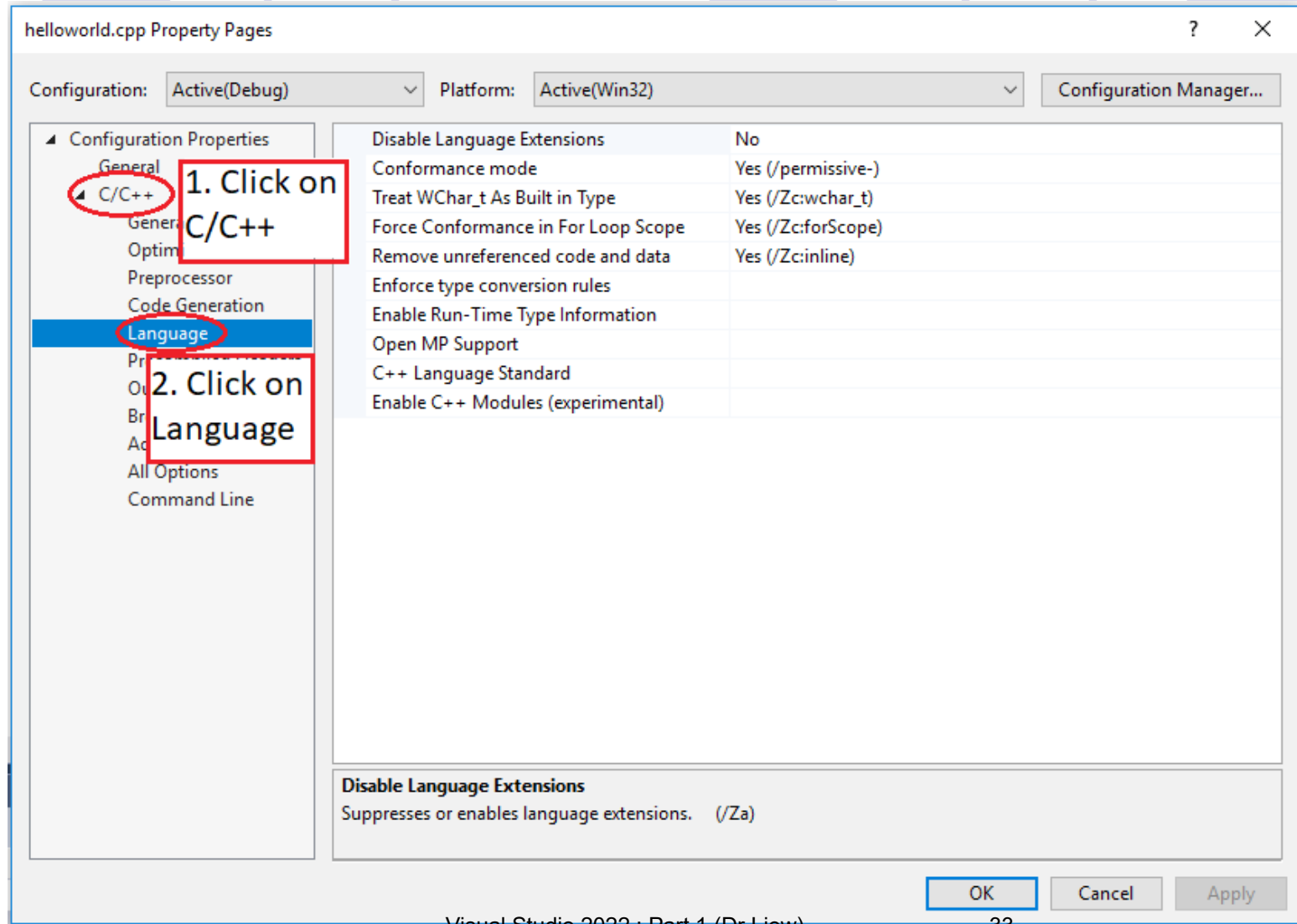
Disable Language Extensions

1. Project

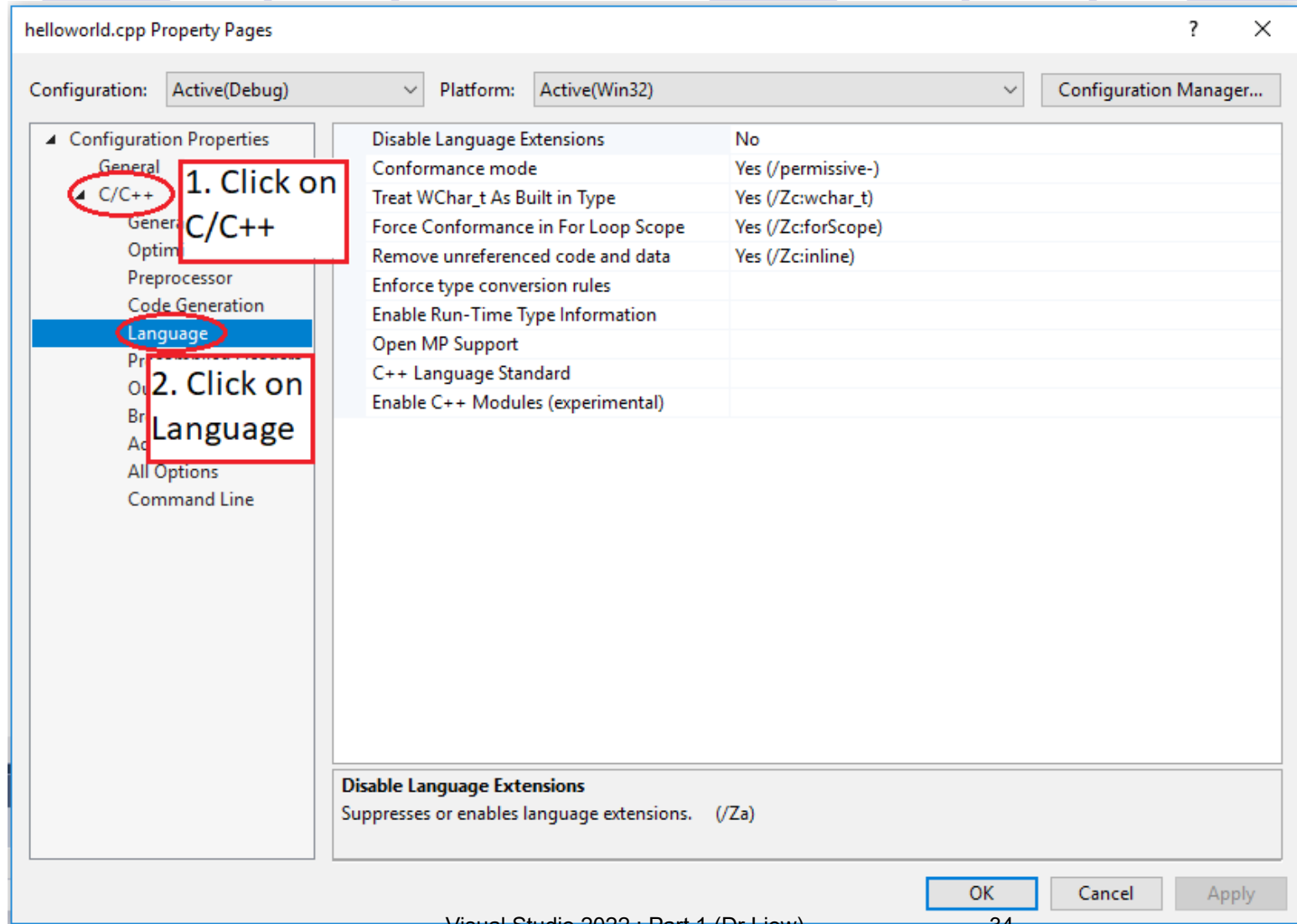


2. Click on project's properties

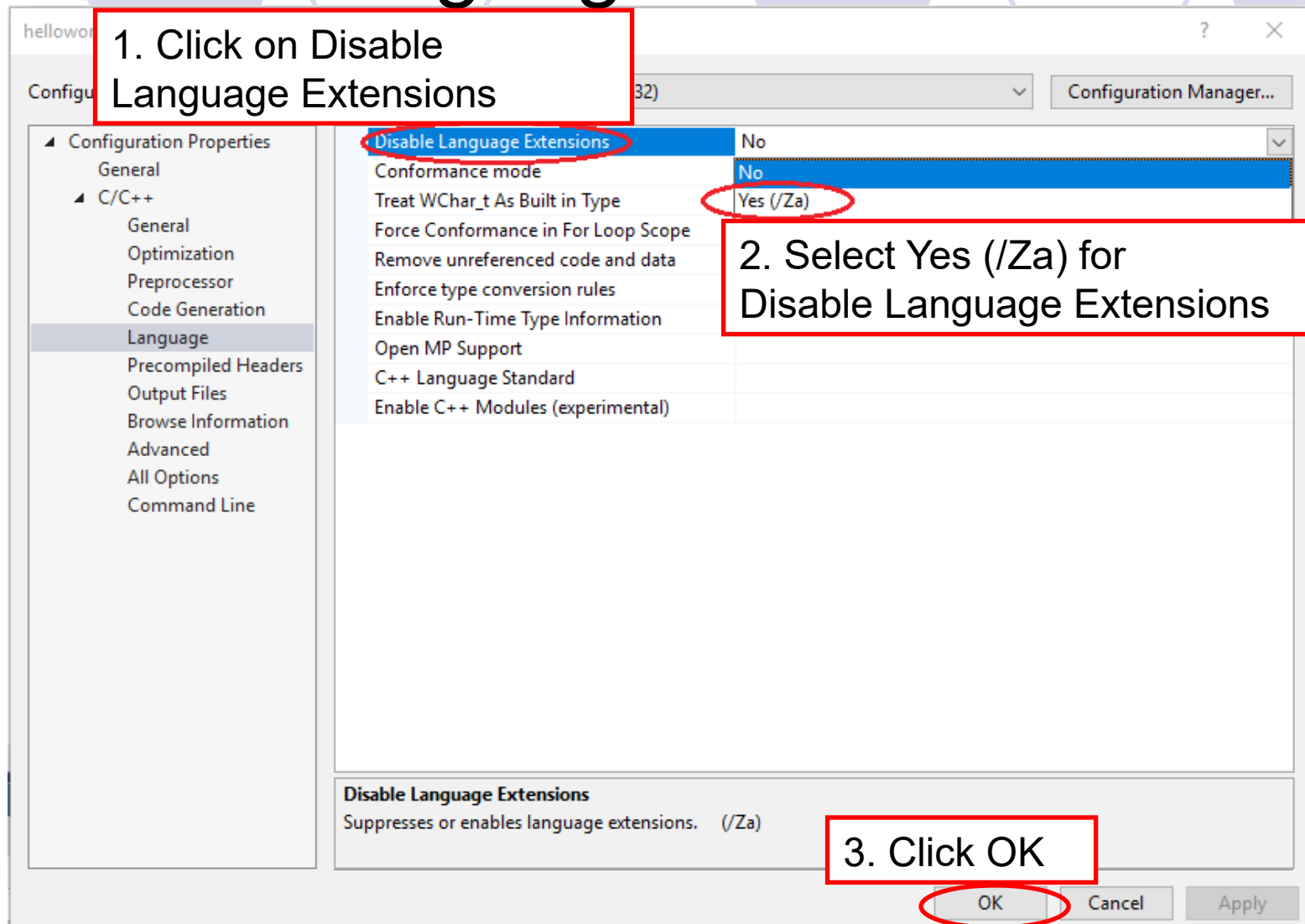
Disable Language Extensions



Disable Language Extensions



Disable Language Extensions





Disable Language Extensions

- This step (disabling language extensions) should be done **after** adding a cpp file.

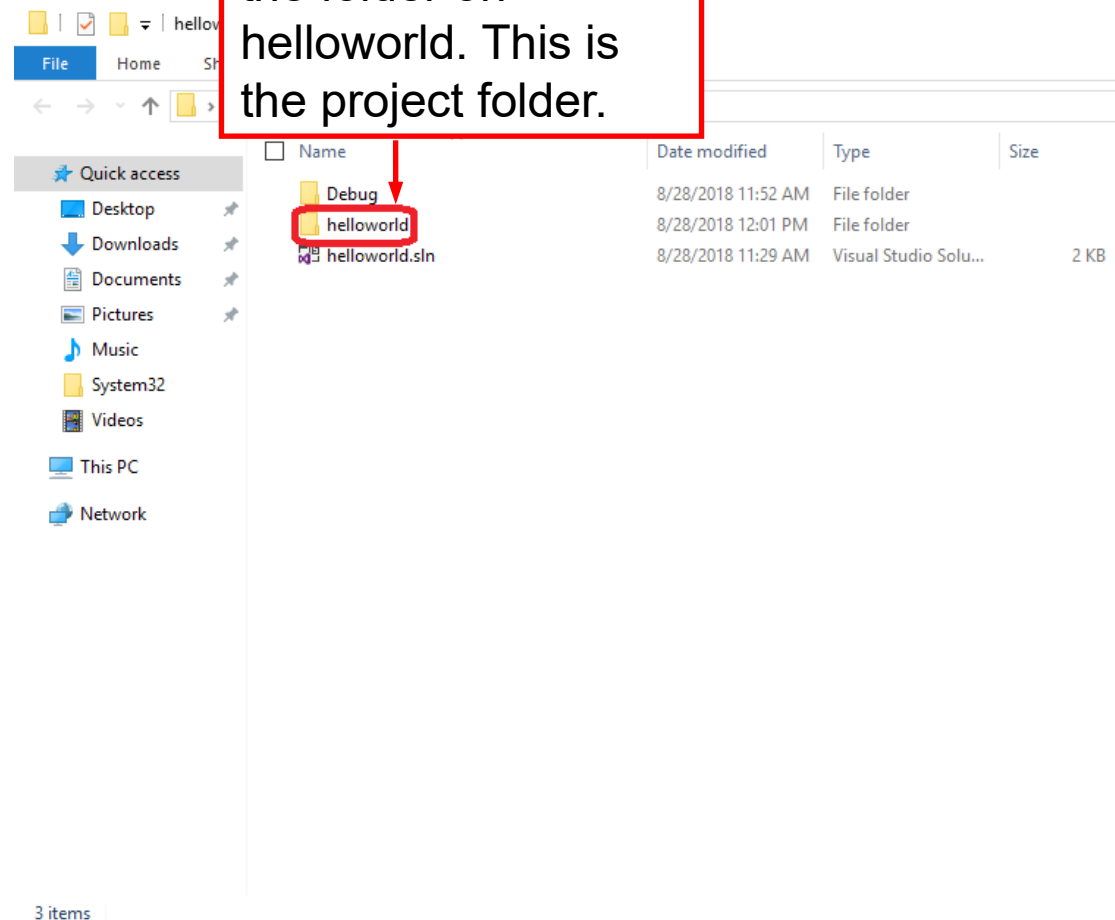
“Where’s my cpp file???”

1. Double-click on the folder on your Desktop (if you choose Desktop as the location).

This is the solution folder.



2. Double-click on the folder on helloworld. This is the project folder.



“Where’s my cpp file???”

Name	Date modified	Type	Size
x64	1/11/2022 4:22 PM	File folder	
helloworld	1/11/2022 4:45 PM	CPP File	1 KB
helloworld.vcxproj	1/11/2022 4:45 PM	VC++ Project	8 KB
helloworld.vcxproj.filters	1/11/2022 4:22 PM	VC++ Project Filte...	1 KB
helloworld.vcxproj.user	1/11/2022 4:04 PM	Per-User Project O...	1 KB

“What about opening an *old* project?”

- If you know the location of your project:

1. Double-click on the solution folder



2. Double-click on the solution icon

Name	Date modified	Type	Size
helloworld	1/11/2022 4:45 PM	File folder	
x64	1/11/2022 4:22 PM	File folder	
helloworld.sln	1/11/2022 4:05 PM	Visual Studio Solu...	2 KB

“What about opening an *old* project?”

- If you do not know the location: When you start MSVS you can select recent solutions.
- But the best is to be organized and put all your projects for a class in a folder.

“What about opening an *old* project?”

- We’ve created a “solution” which contains a “project” which contains the cpp file.
- It’s possible to have a solution containing **multiple** projects where **each project** contains a cpp file meant for a single program.
- We’ll stick to **one solution, one project, one cpp file** for each program – this is less confusing for beginners.

“What about opening an *old* project?”

- Last resort: Search your machine's hard drive for the solution folder if you remember the name.



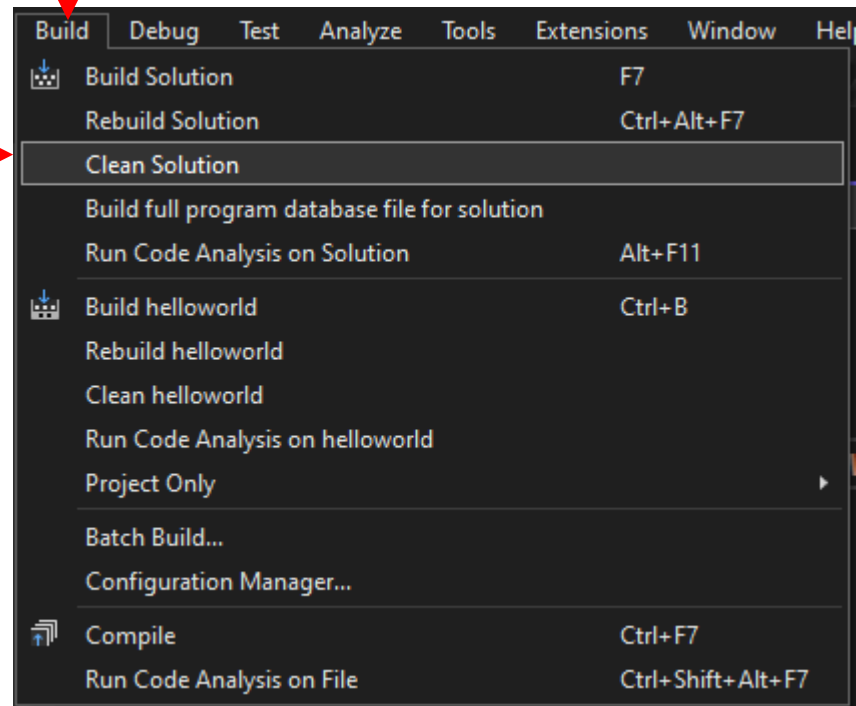
“I’m out of space!”

- Most of the files in your solution folder are created when you do Ctrl-F5 and so can be deleted if you don’t have enough space.
- The easiest way to remove these files is to do “Clean Solution” ...

“I’m out of space!”

1. Pull down Build

2. Click on Clean Solution



“How do I copy my work to my stick?”

1. Do “Clean Solution”

2. Copy the solution folder you’ve created



to your USB storage, external HD, etc.

- To resume work on another machine: Copy the solution folder from your storage to the machine and work from there

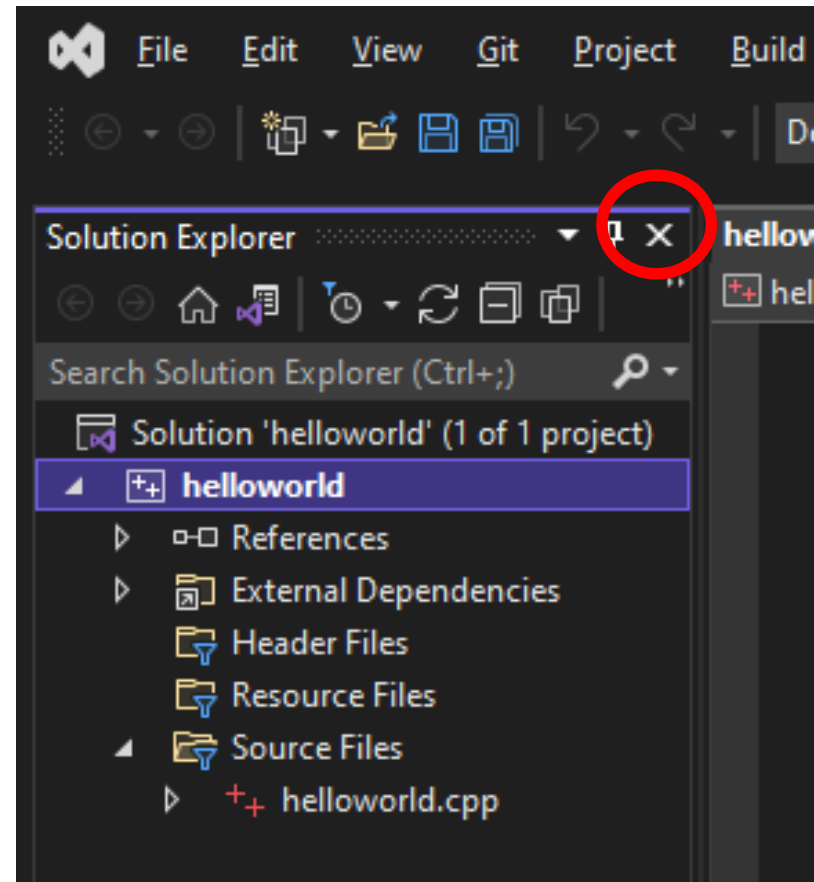


“How do I copy my work to my stick?”

- Note: USB drives are slow. Use it only for backup.
- I strongly suggest you get a Western Digital external HD for backup.

“Where did Solutions Explorer go?”

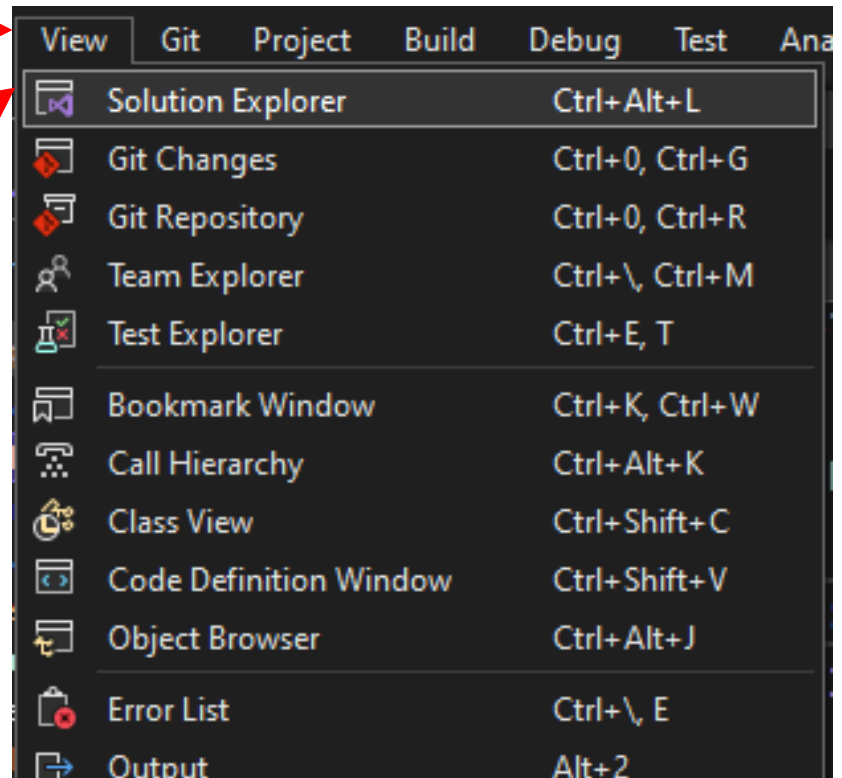
Oh no!!! I closed the
Solution Explorer ...



“Where did Solutions Explorer go?”

1. View

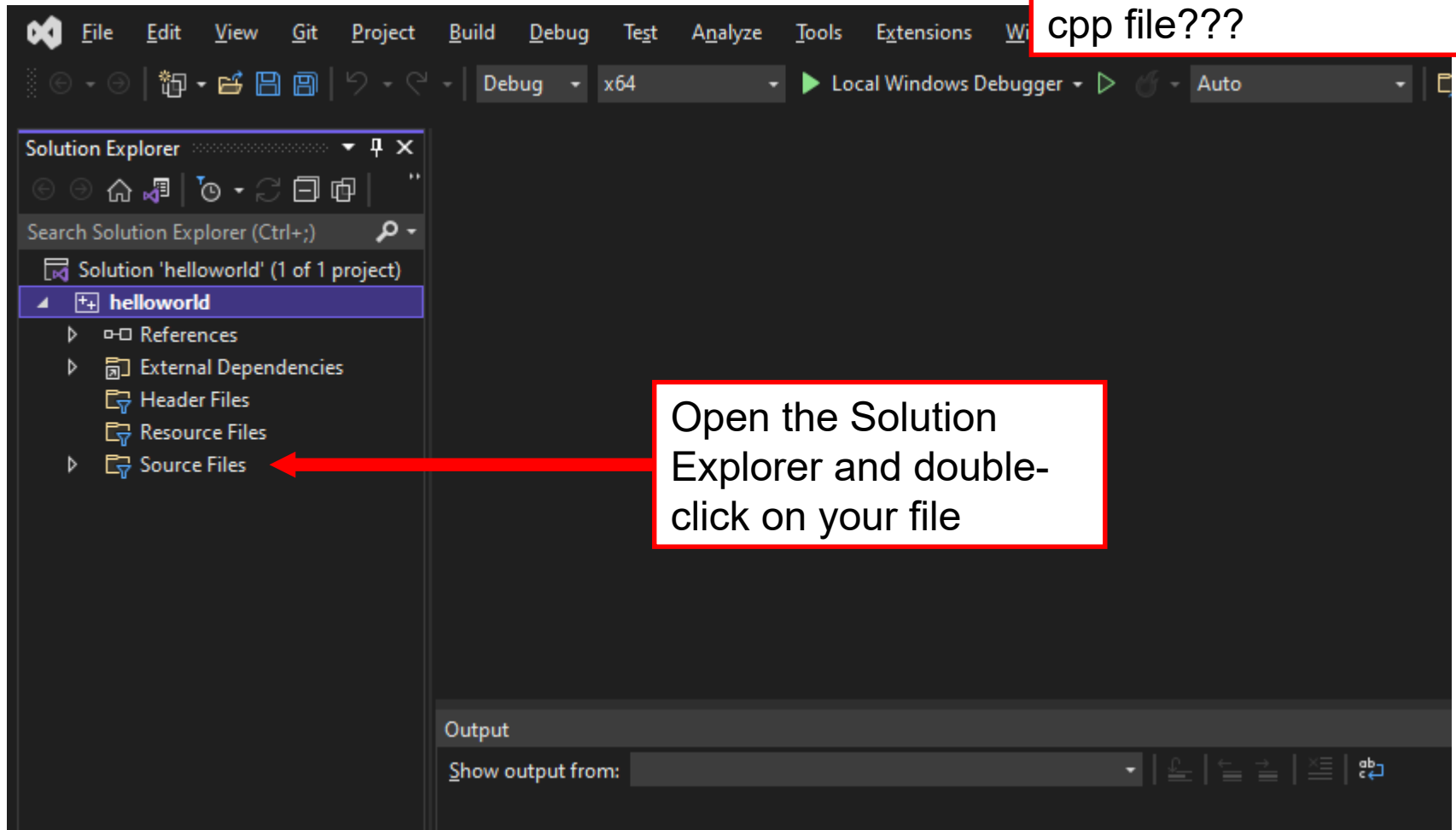
2. Click on Solution Explorer



You can find most of the windows this way

“Oops, I closed my source file!!!”

Yikes!!! Where's the
cpp file???



“Ctrl-F5 doesn’t do anything!” or “It runs the same after I changed the cpp file!”

- Do NOT double-click on a C++ file in your Windows environment – you should double-click on the solution icon.
- If in doubt, close Visual Studio 2022, and then double-click on the solution icon for the right program.

“Ctrl-F5 doesn’t do anything!” or “It runs the same after I changed the cpp file!”

- The point: In order to build the executable, Visual Studio 2022 needs more than just the cpp file. The information needed is associated with the solution (or project), not the cpp file.

“Can I use another C++ compiler?”

- Yes ... as long as you're writing standard C/C++ code.
- All work will be checked against the following two compilers:
 - g++
 - Visual Studio 2022

Proficiency with Editor



- Knowing how to use a modern-day editor today is like knowing how to use a pen in 1900 – you'd better be proficient with it
- Learn to use hotkeys (shortcuts)
- Most hotkeys in Visual Studio 2022 are the same for MS Word, Powerpoint, etc.
- Force yourself to use them

Proficiency with Editor

- Short list of common hotkeys:
 - Copy Ctrl-c
 - Paste Ctrl-v
 - Cut Ctrl-x
 - Undo Ctrl-z
 - Alt-Tab Switch between windows
 - Etc. (google for more)
- For building and running your program:
 - Ctrl-F5