

Lab 1

Getting Started with Visual Studio 2019

Fall 2021

Outline

- Introduction and installation of Visual studio (VS 2019)
 - 3 options
 - CSC Terminal
 - Install Own PC on Windows 10
 - Mac OS connected to CSC Lab
- Writing, compiling, and executing C++ programs using VS

Working Environment

- In this course, you will be working with PC under Windows 10, and all the programs will be written with Visual Studio 2019.
- In this lab, you will explore and get familiar with the MS Visual Studio 2019 compiler working environment.
- Visual Studio 2019 is an integrated developing environment (IDE). In Visual Studio 2019 compiler, you can edit, compile, link, run, debug and manage your programming projects.

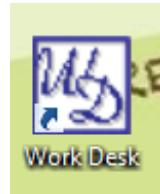
Options for Program Development with VS2019

- Option

1. Work on CSC terminal
2. Install VS2019 on own PC/Windows 10
3. Connect to CSLab to use VS2019

Option 1

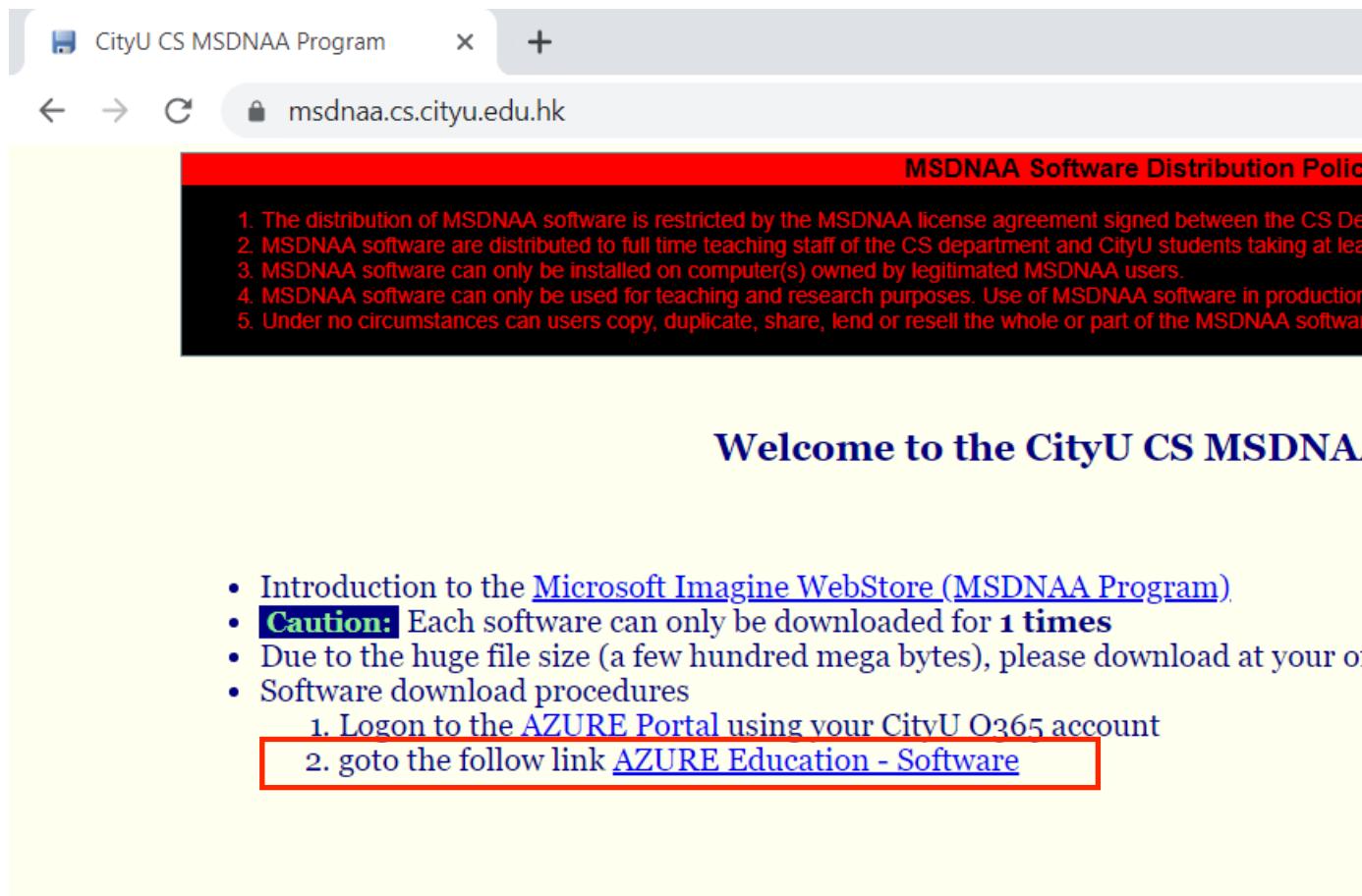
- Work on CSC terminal
 - Select from Work Desk
 - Select Microsoft Visual Studio Professional 2019 Menu
 - Select Microsoft Visual Studio 2019 - Visual Studio 2019

A screenshot of a web-based application titled "Work Desk - City University of Hong Kong". The URL in the address bar is "cc106/intranet/StudLAN/WinXP/CC_AppMenu-B5.asp". The page has a pink header with the "Cityu Work Desk" logo. Below the header is a search bar with the placeholder "Search Intranet" and a magnifying glass icon. The main content area displays a list of software applications. A red arrow points to the "Microsoft Visual Studio Professional 2019" entry in the list. The list includes:

- IBM SPSS Statistics 26.0
- Locale - Change User Locale code to Chinese (Hong Kong S.A.R.)
- Locale - Change User Locale code to English (United Kingdom)
- Locale - Change User Locale code to English (United States)
- Matlab 9.6 (R2019a) - Campus License with 88 toolboxes
- Microsoft AppLocale 1.0
- Microsoft Expression Studio 4 Web Professional
- Microsoft Mathematics 4.0
- Microsoft Office Professional Plus 2019 - Access
- Microsoft Office Professional Plus 2019 - Excel
- Microsoft Office Professional Plus 2019 - PowerPoint
- Microsoft Office Professional Plus 2019 - Publisher
- Microsoft Office Professional Plus 2019 - Word
- Microsoft Office Professional Plus 2019 menu
- Microsoft SharePoint Designer 2013
- Microsoft Visual Studio Professional 2019** (highlighted by a red arrow)
- Microsoft Windows Media Player 12
- Mozilla Firefox 68
- Printer - Check Print Quota
- Adobe CS6 Design Premium - Photoshop (LT Department)
- Adobe CS6 Design and Web Premium - Dreamweaver (CSC)
- Adobe CS6 Design and Web Premium - Fireworks (CSC)
- Adobe CS6 Design and Web Premium - Flash Professional (CSC)
- Adobe CS6 Design and Web Premium - Illustrator (CSC)
- Adobe CS6 Design and Web Premium - InDesign (CSC)
- Adobe CS6 Design and Web Premium - Photoshop (CSC)
- Adobe CS6 Design and Web Premium - Acrobat X pro (LAC Department)
- Adobe CS6 Design and Web Premium - Dreamweaver (LAC Department)
- Adobe CS6 Design and Web Premium - Fireworks (LAC Department)
- Adobe CS6 Design and Web Premium - Flash Professional (LAC Department)
- Adobe CS6 Design and Web Premium - InDesign (LAC Department)
- Adobe CS6 Design and Web Premium - Illustrator (LAC Department)
- Adobe CS6 Design and Web Premium - Photoshop (LAC Department)
- Adobe CS6 Master Collection - After Effects (AST Department)
- Adobe CS6 Master Collection - Audition (AST Department)
- Adobe CS6 Master Collection - Dreamweaver (AST Department)
- Adobe CS6 Master Collection - Flash Professional (AST Department)
- Adobe CS6 Master Collection - Illustrator (AST Department)

Option 2

- Install VS2019 on own PC/Windows 10
- <http://msdnna.cs.cityu.edu.hk/>



The screenshot shows a web browser window with the title "CityU CS MSDNAA Program". The address bar contains "msdnna.cs.cityu.edu.hk". The main content area displays the "MSDNAA Software Distribution Policy" which includes a list of five rules:

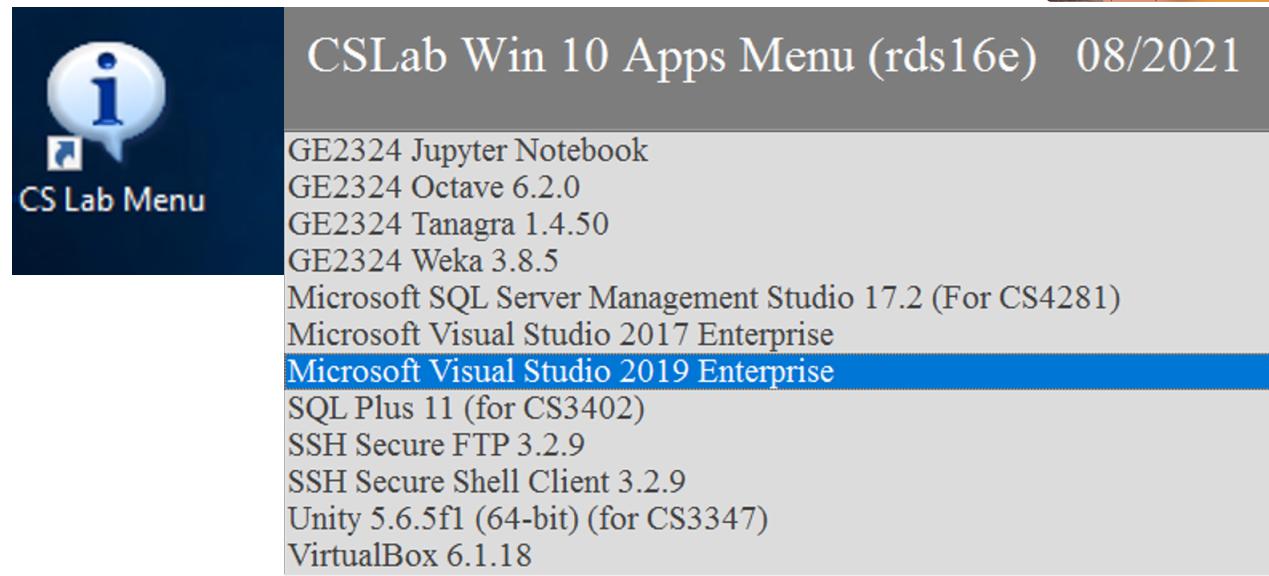
1. The distribution of MSDNAA software is restricted by the MSDNAA license agreement signed between the CS Department and CityU.
2. MSDNAA software are distributed to full time teaching staff of the CS department and CityU students taking at least one course in the CS department.
3. MSDNAA software can only be installed on computer(s) owned by legitimated MSDNAA users.
4. MSDNAA software can only be used for teaching and research purposes. Use of MSDNAA software in production environments is prohibited.
5. Under no circumstances can users copy, duplicate, share, lend or resell the whole or part of the MSDNAA software.

Below the policy text, the heading "Welcome to the CityU CS MSDNA" is visible. A bulleted list provides instructions for software download:

- Introduction to the [Microsoft Imagine WebStore \(MSDNAA Program\)](#).
- **Caution:** Each software can only be downloaded for **1 times**
- Due to the huge file size (a few hundred mega bytes), please download at your own pace.
- Software download procedures
 1. Logon to the [AZURE Portal](#) using your CityU O365 account
 2. goto the follow link [AZURE Education - Software](#)

Option 3

- Connect to CSLab to use VS2019 [for Mac]
 - Download & install Microsoft Remote Desktop
 - Run Microsoft Remote Desktop
 - Connect to rds16e.cs.cityu.edu.hk
 - Login with CityU e-id & password



CSLab Win 10 Apps Menu (rds16e) 08/2021

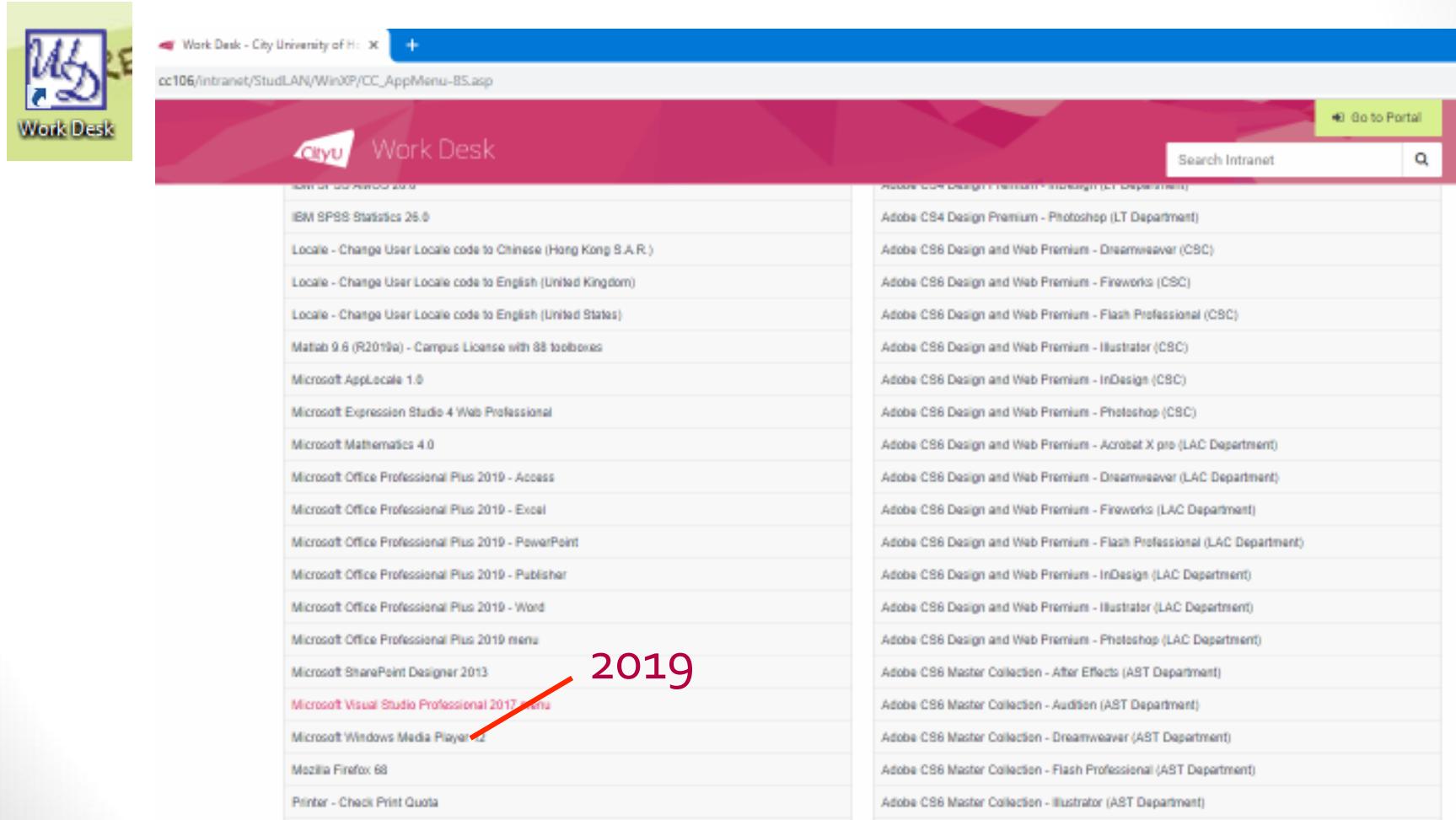
GE2324 Jupyter Notebook
GE2324 Octave 6.2.0
GE2324 Tanagra 1.4.50
GE2324 Weka 3.8.5
Microsoft SQL Server Management Studio 17.2 (For CS4281)
Microsoft Visual Studio 2017 Enterprise
Microsoft Visual Studio 2019 Enterprise
SQL Plus 11 (for CS3402)
SSH Secure FTP 3.2.9
SSH Secure Shell Client 3.2.9
Unity 5.6.5f1 (64-bit) (for CS3347)
VirtualBox 6.1.18

Option 1

Work on CSC terminal

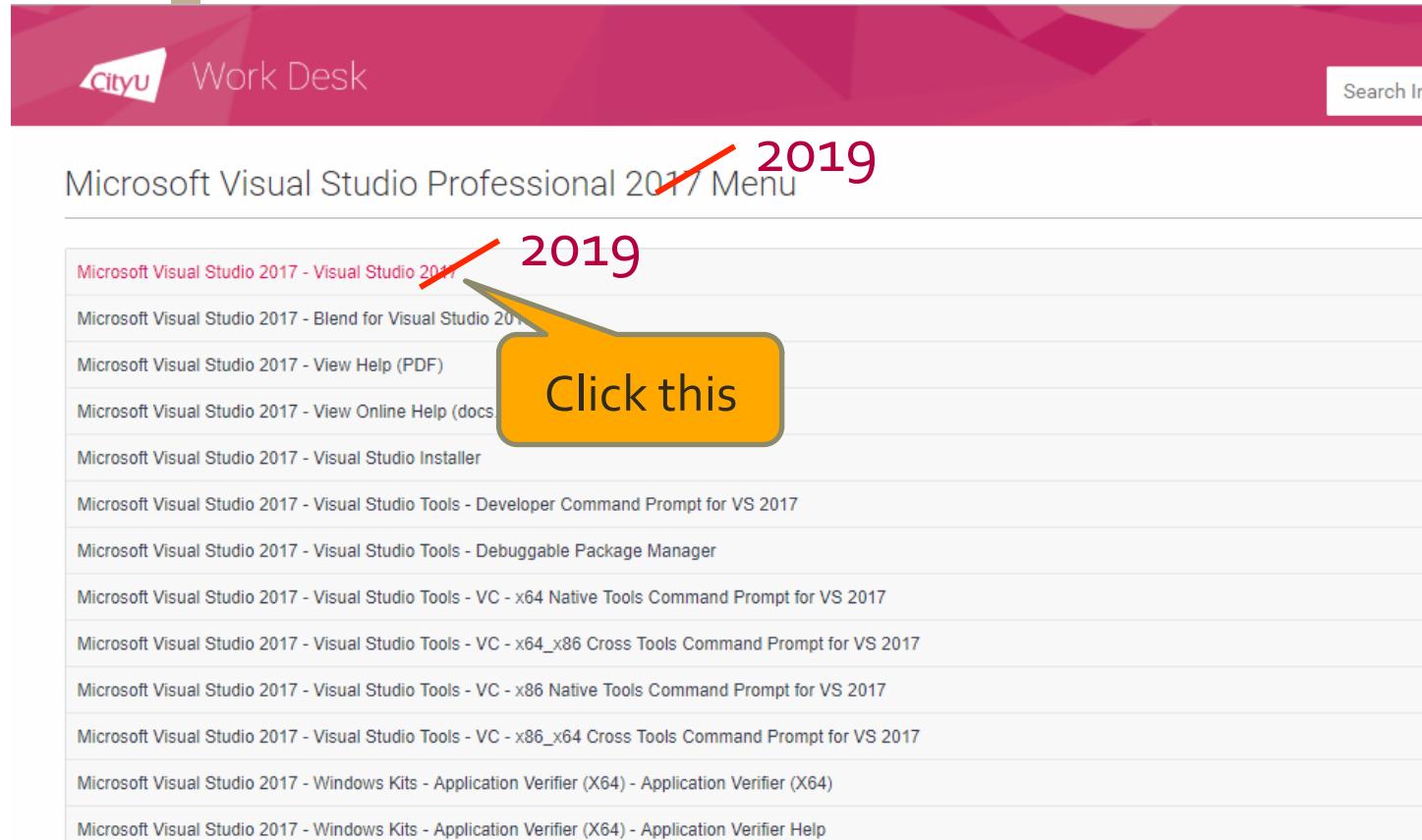
How to start VS2019 in CSC labs

- Double click the "Work Desk" icon on the desk



How to start VS2019 in CSC labs

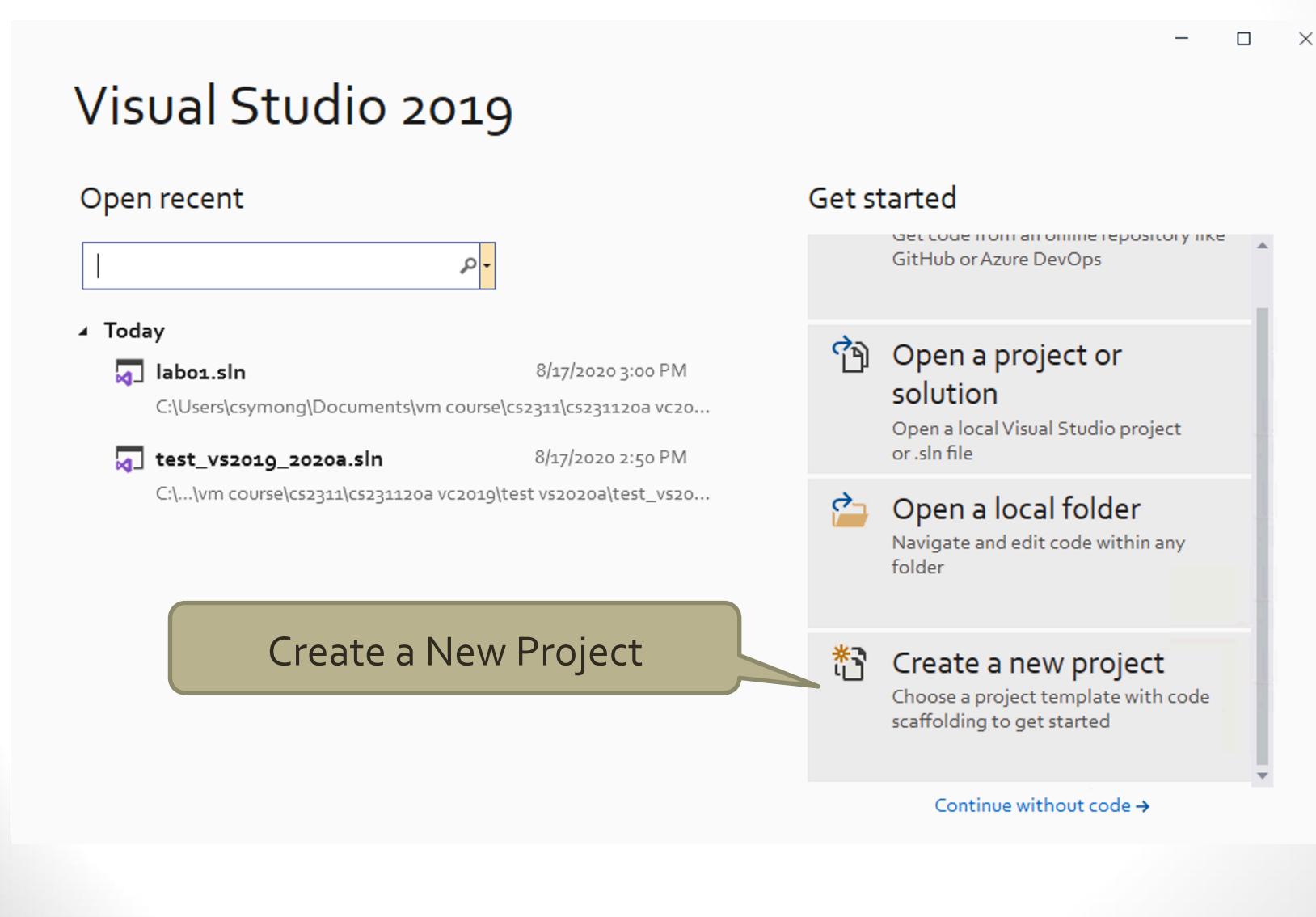
- Click "Microsoft Visual Studio 2019-Visual Studio 2019"



Steps for writing, compiling and running a C++ program

- 1. Create a project and project folder**
- 2. Create a folder for storing programs (source code)**
- 3. Add the source code to project**
- 4. Compile and run the program**

Start VS2019



Create a Project

Create a new project

Recent project templates

Empty Project

C++

4. Create an Empty Project

1. a C++ project

2. on Windows OS

3. a Console project

Search for templates (Alt+S)

C++

Windows

Console

Clear all



Empty Project

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

C++ Windows Console



Console App

Run code in a Windows terminal. Prints "Hello World" by default.

C++ Windows Console



Windows Desktop Wizard

Create your own Windows app using a wizard.

C++ Windows Console Desktop Library



Shared Items Project

A Shared Items project is used for sharing files between multiple projects.

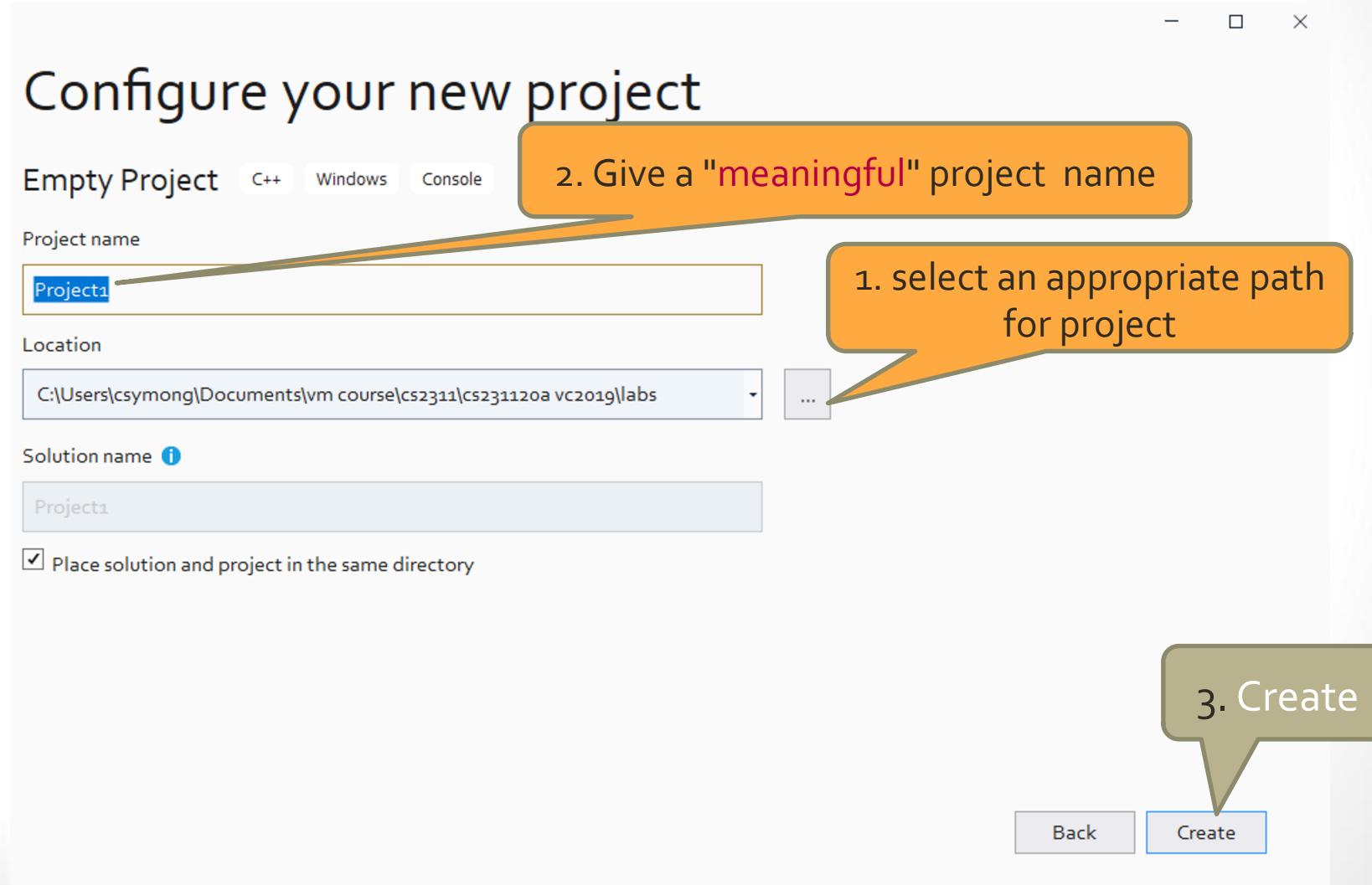
C++ Android iOS Linux Windows Console Desktop

Back

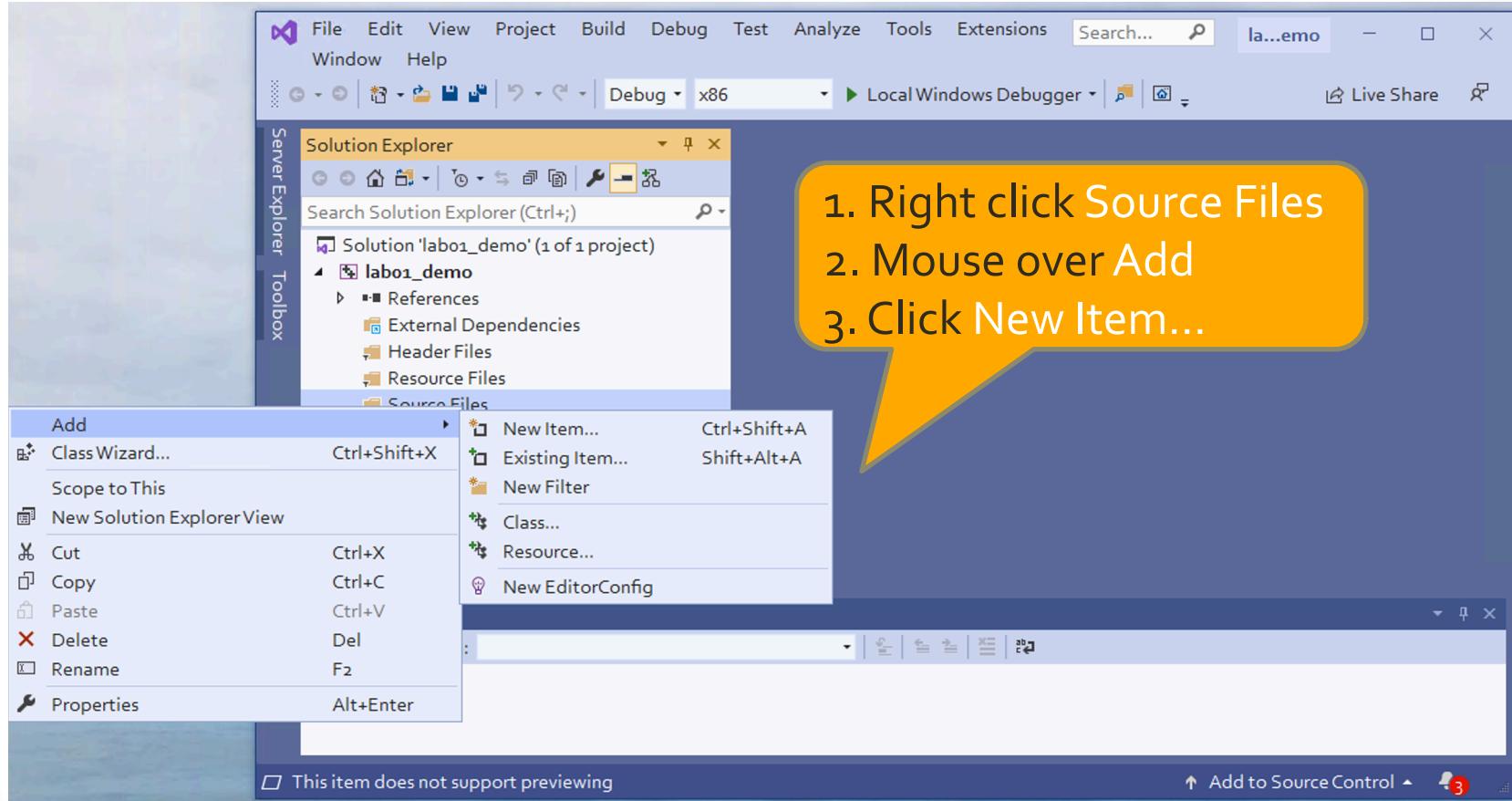
Next

5. Next

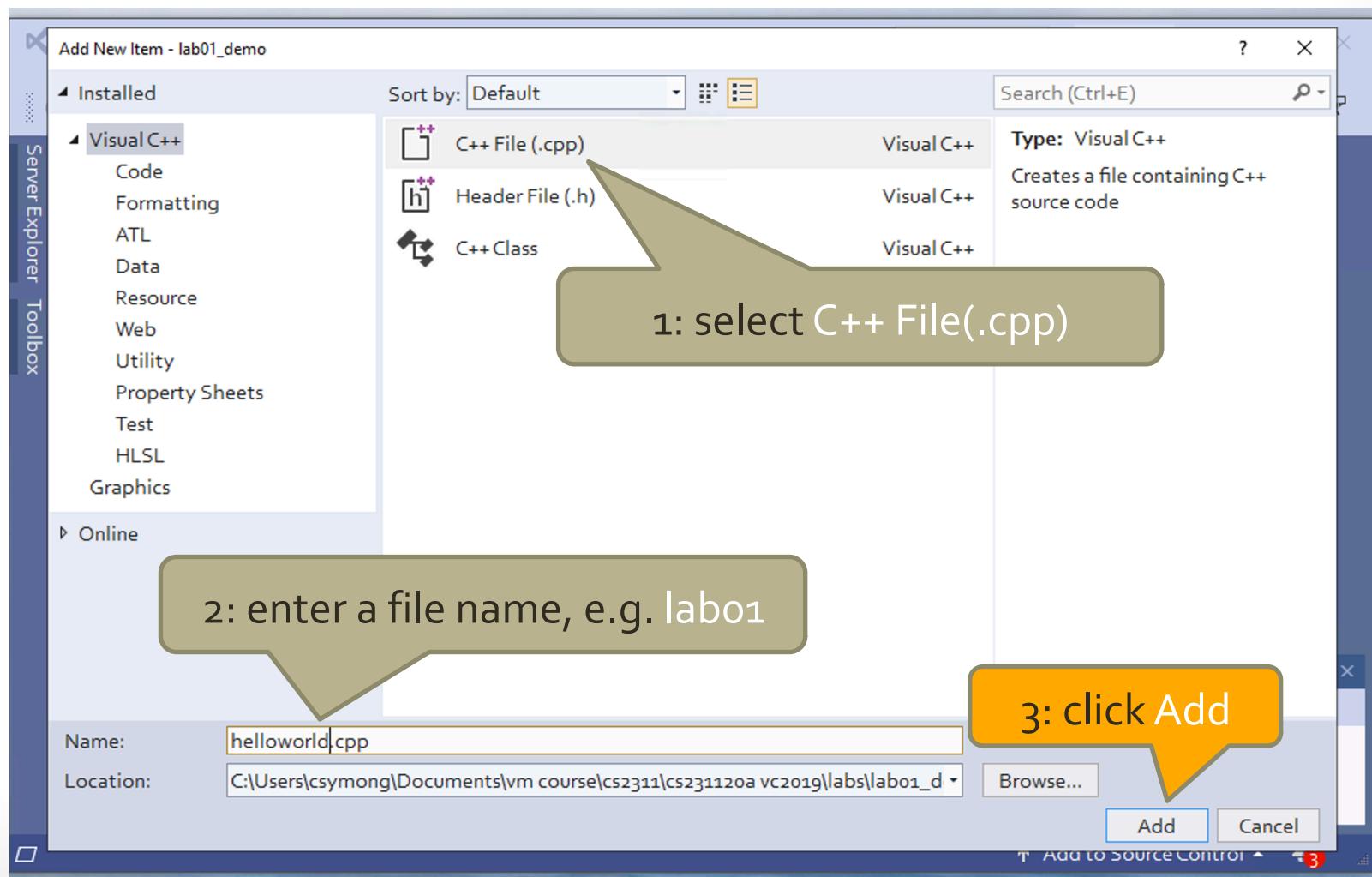
Create a project



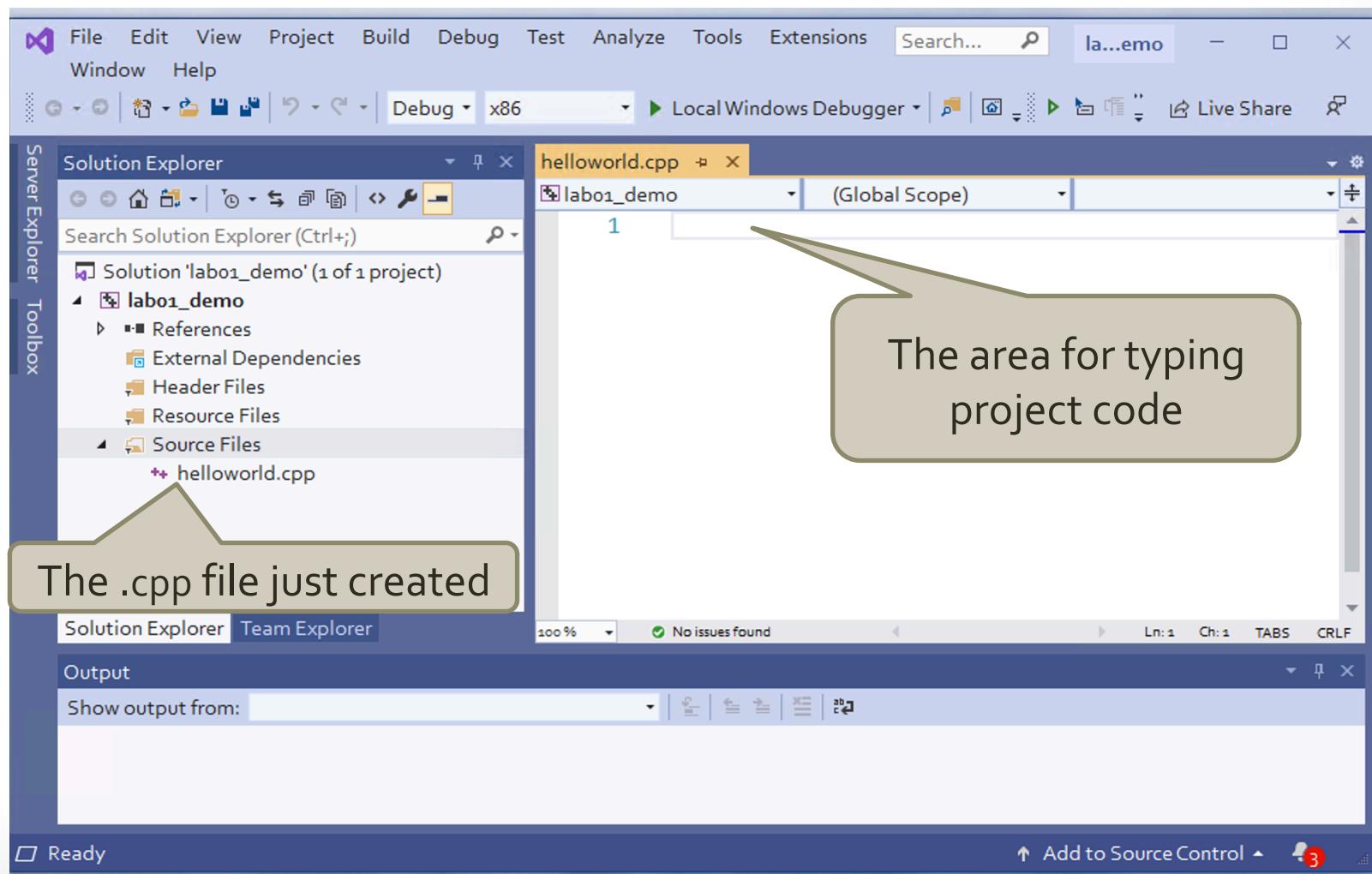
Add a C++ program file into the project



Add a C++ program file into the project



Writing code



Writing code

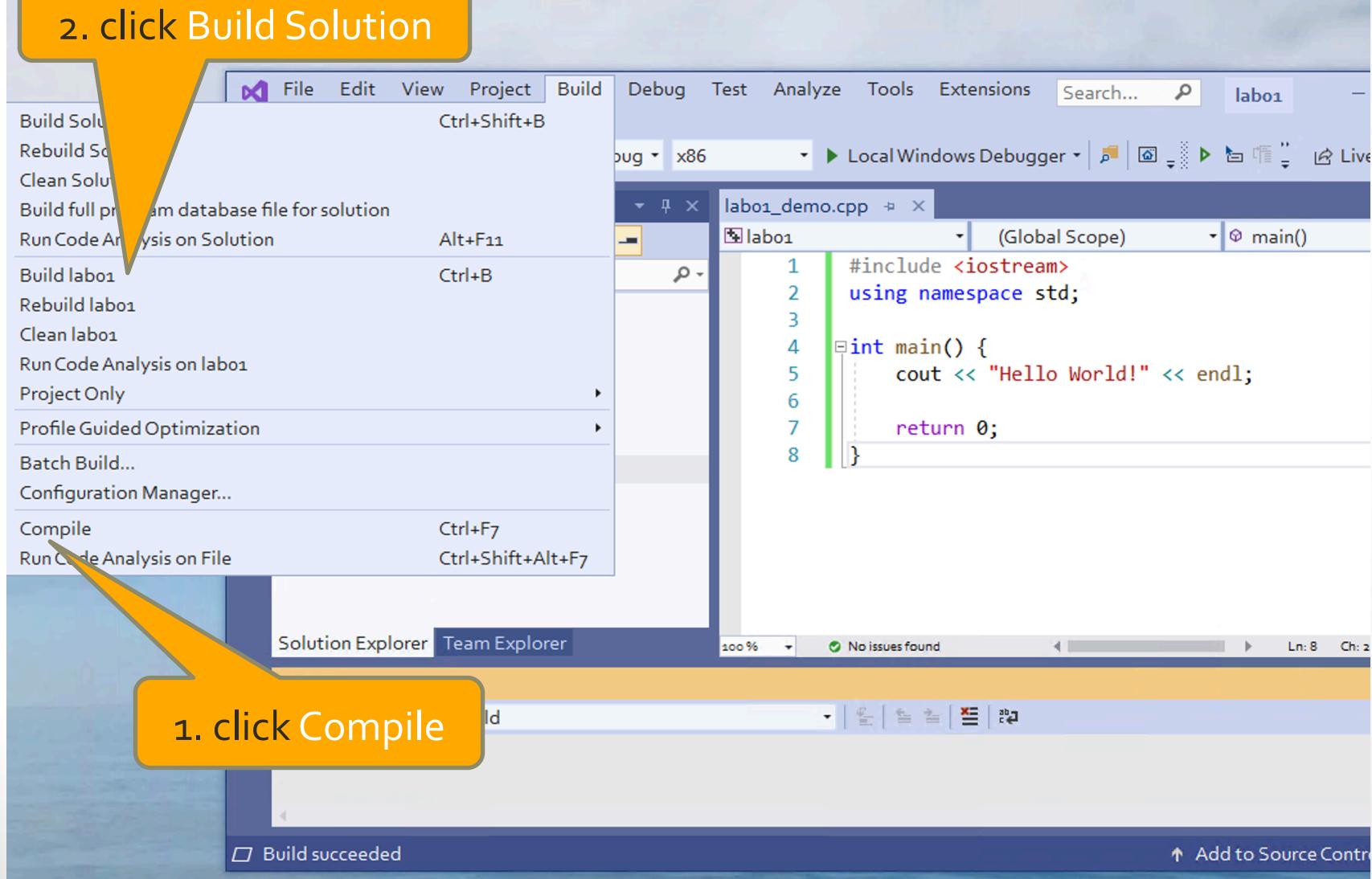
- Try to type the Hello World program, without looking at the lecture notes

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

int main() {
    cout << "Hello World!" << endl;
    return 0;
}
```

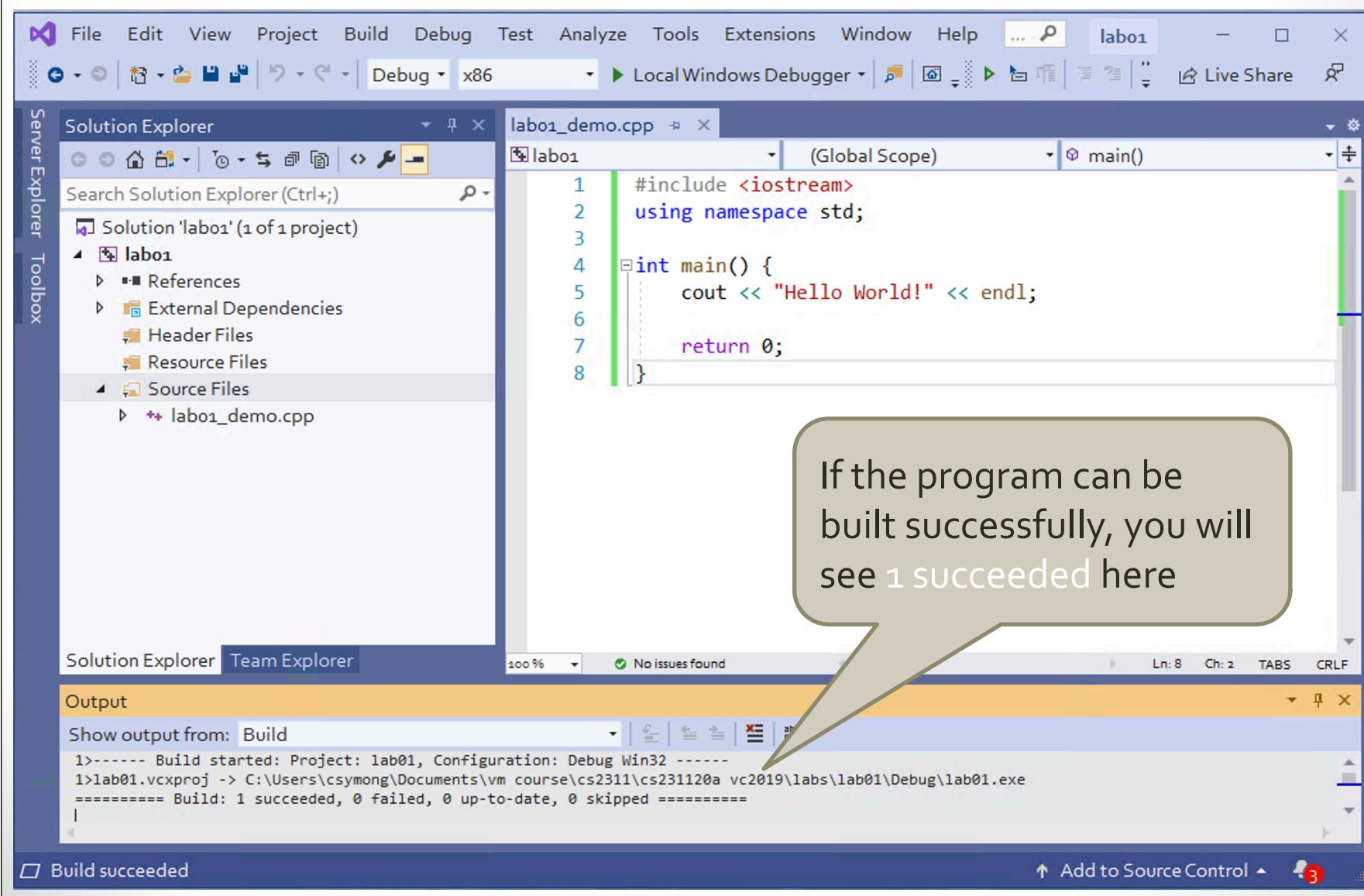
Compile & Build your program [Ctrl+F7 & Ctrl+Shift+B]

2. click Build Solution

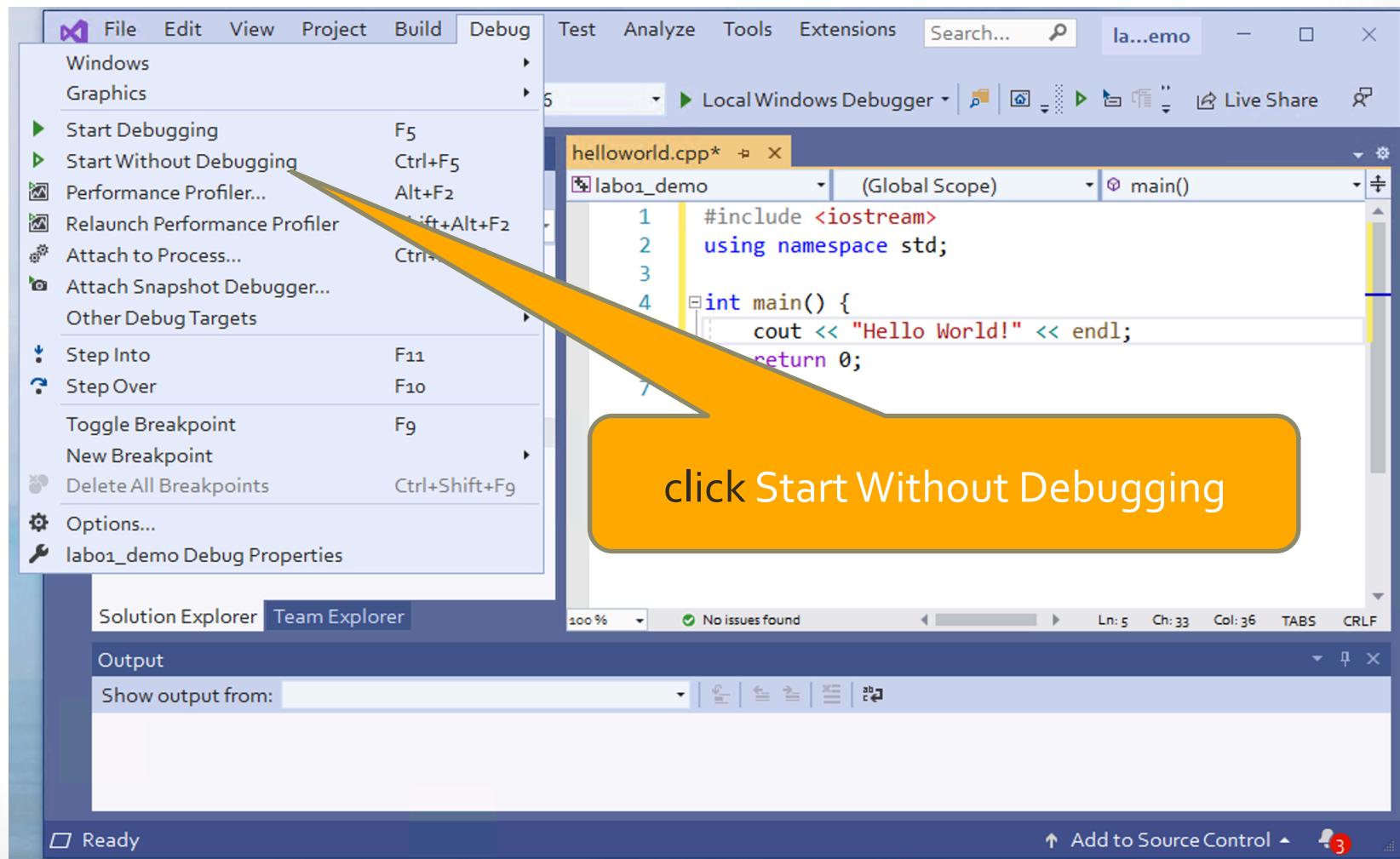


1. click Compile

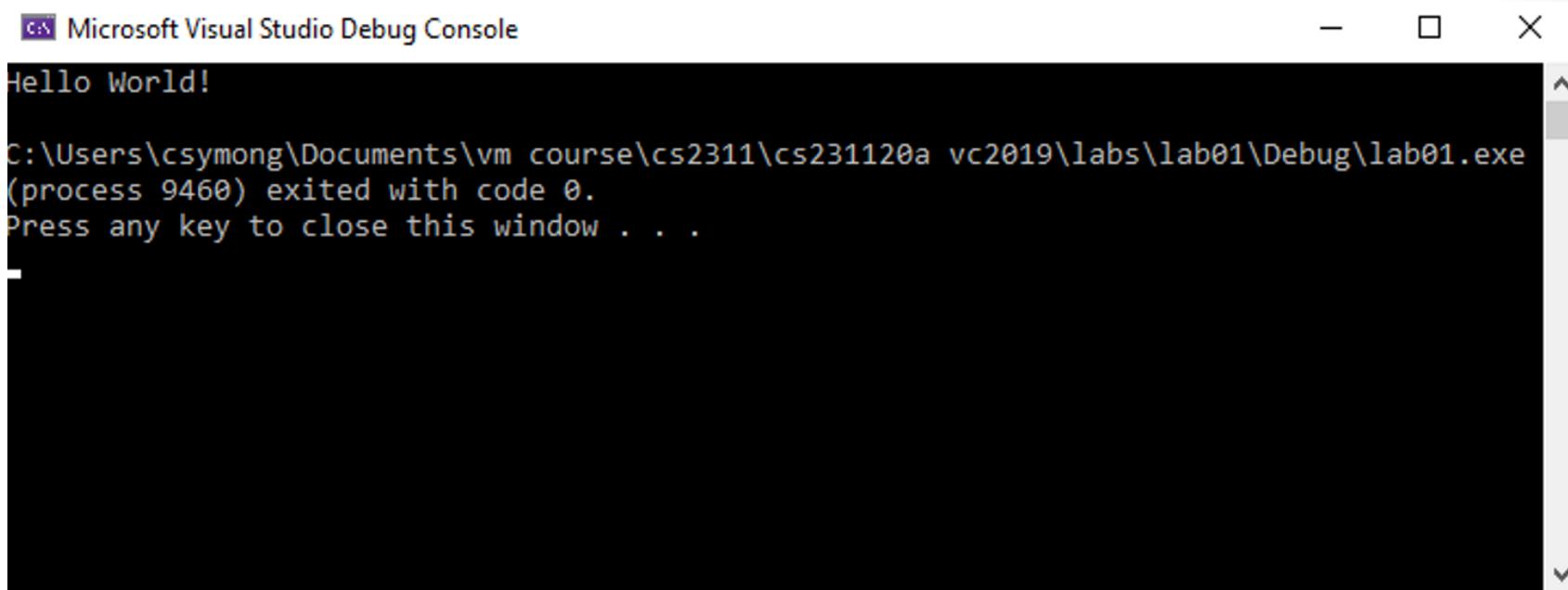
Build your program



Execute your program [Ctrl+F5]



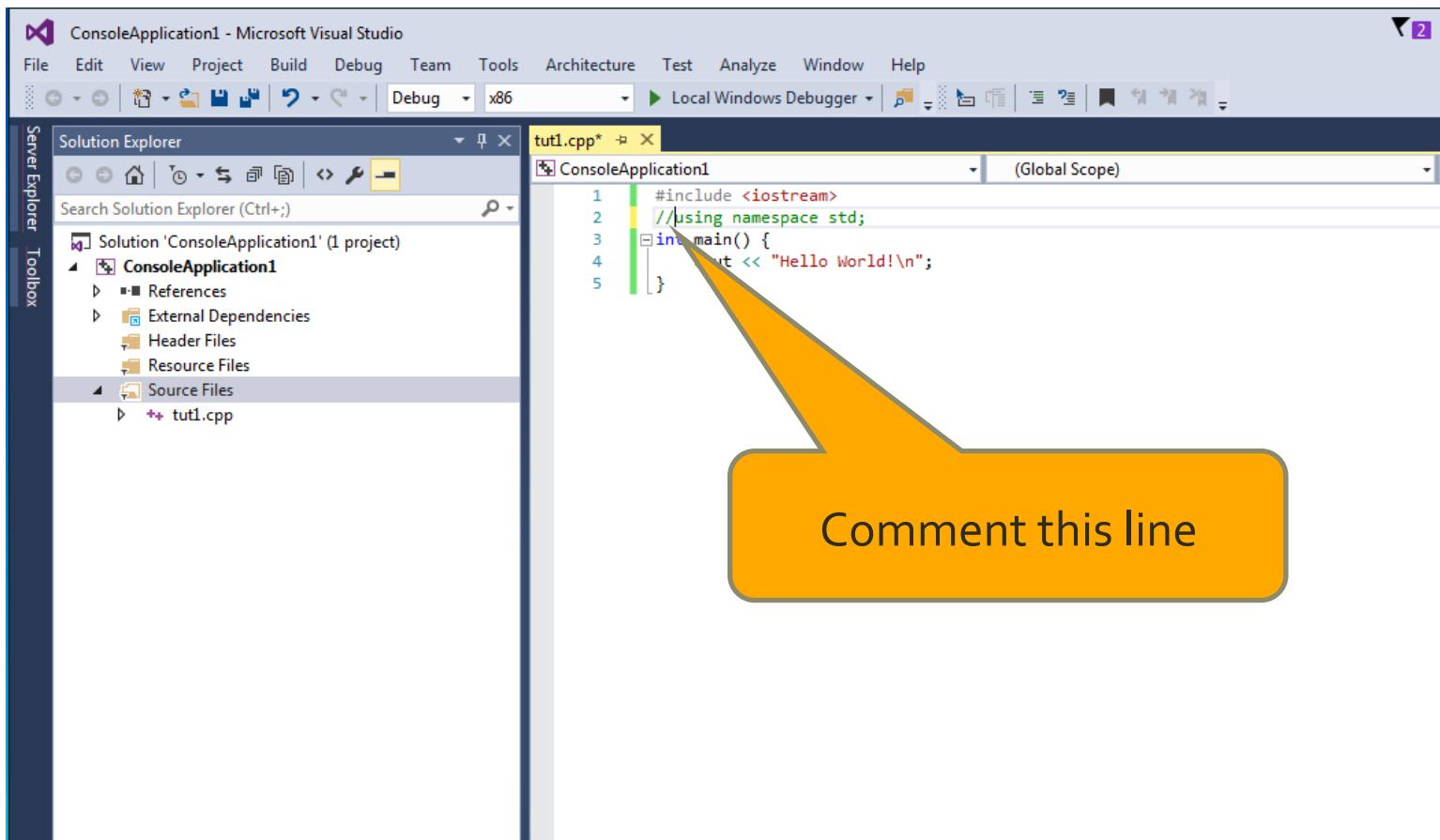
Result of Execution



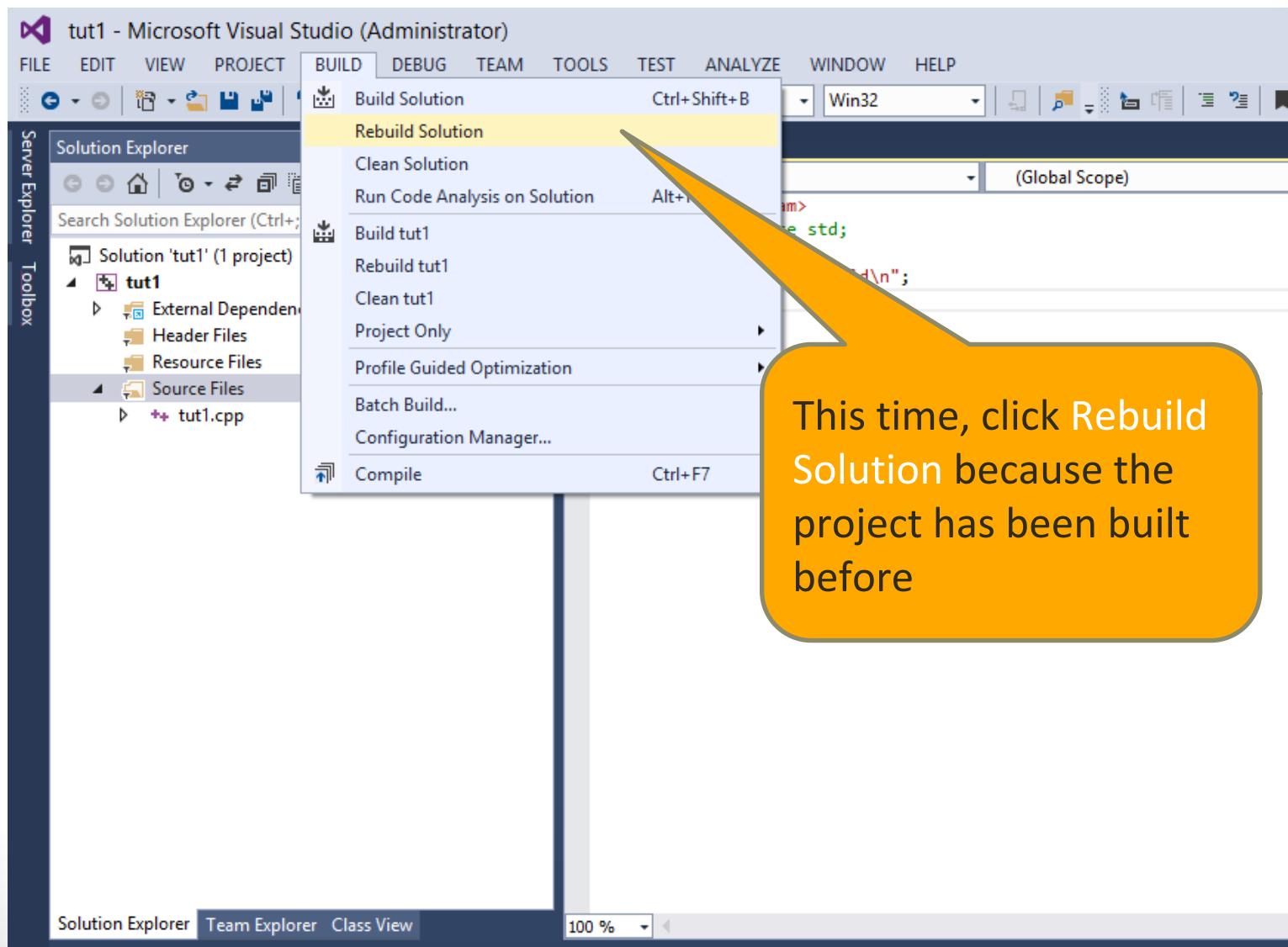
Microsoft Visual Studio Debug Console

```
Hello World!  
C:\Users\csymong\Documents\vm course\cs2311\cs231120a vc2019\labs\lab01\Debug\lab01.exe  
(process 9460) exited with code 0.  
Press any key to close this window . . .
```

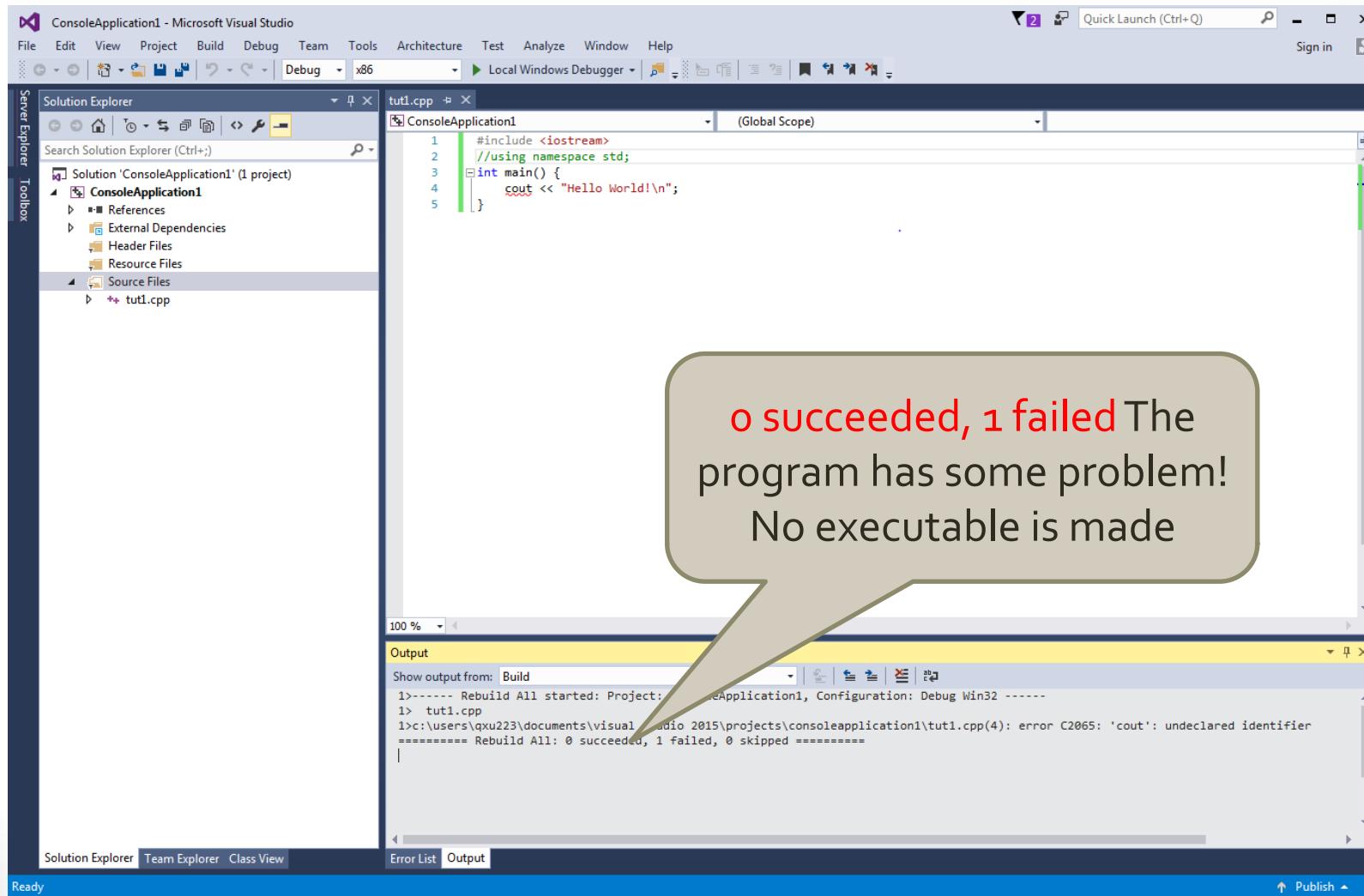
Try it out!



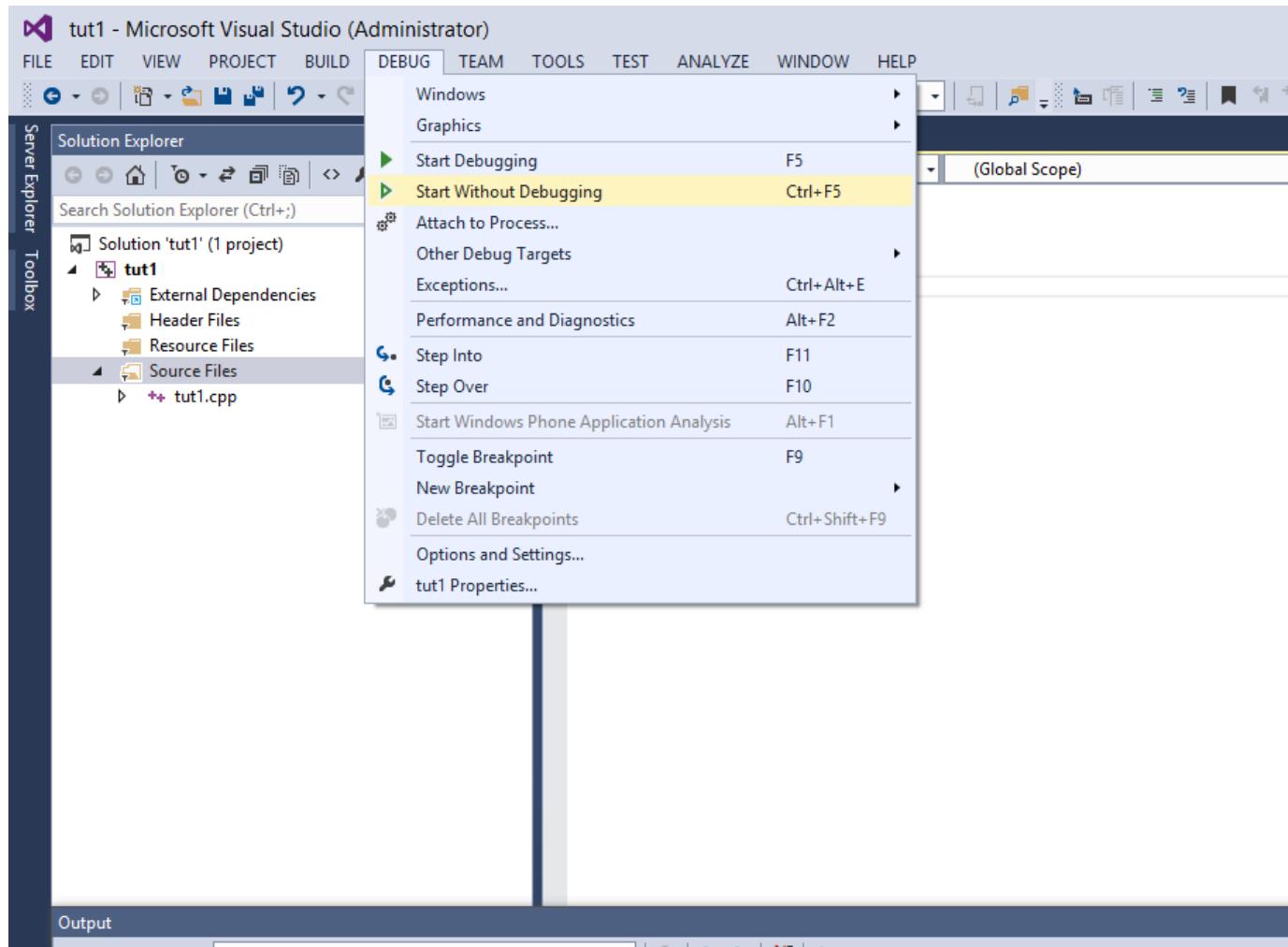
Rebuild the project



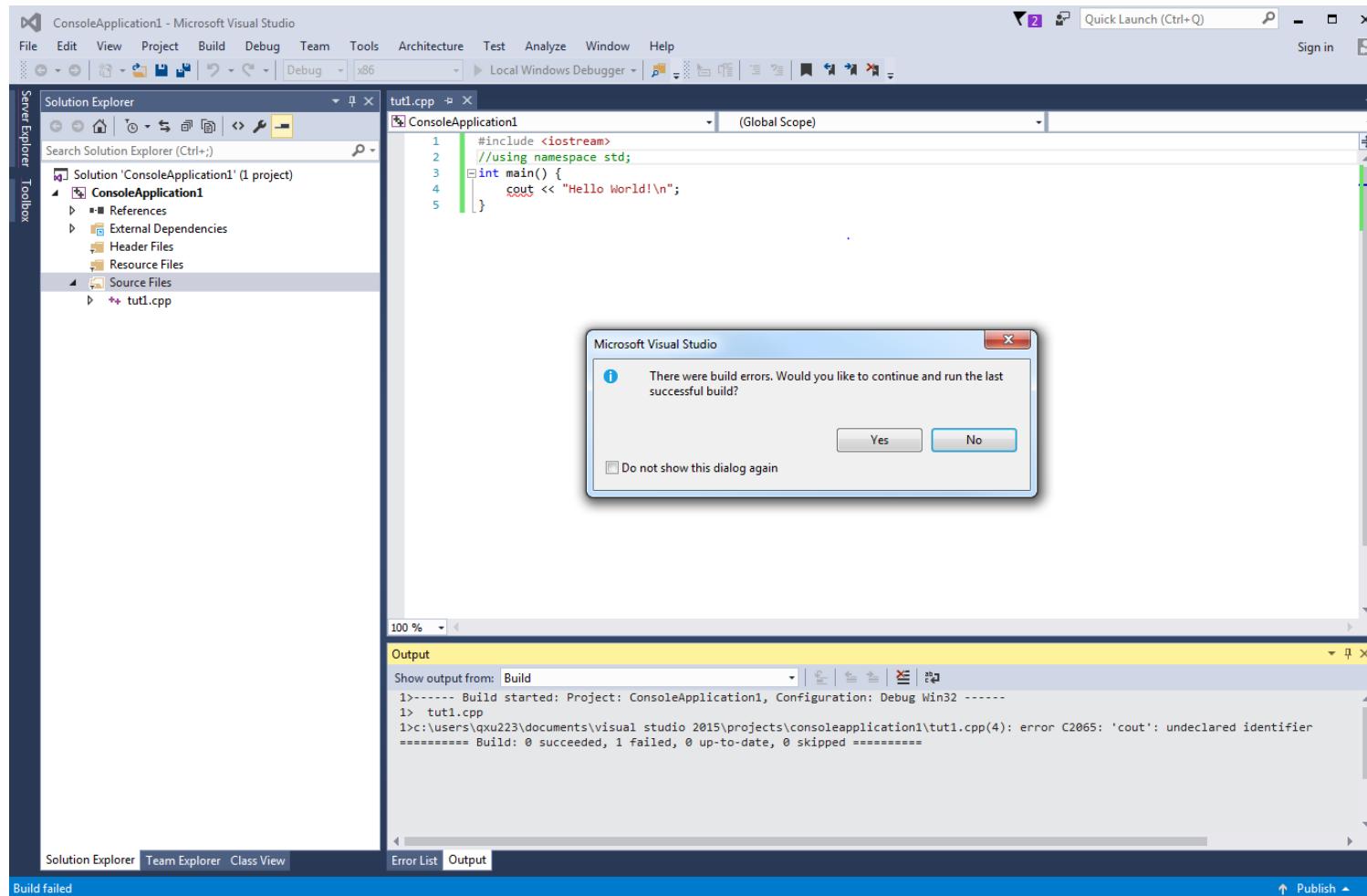
Got an error message



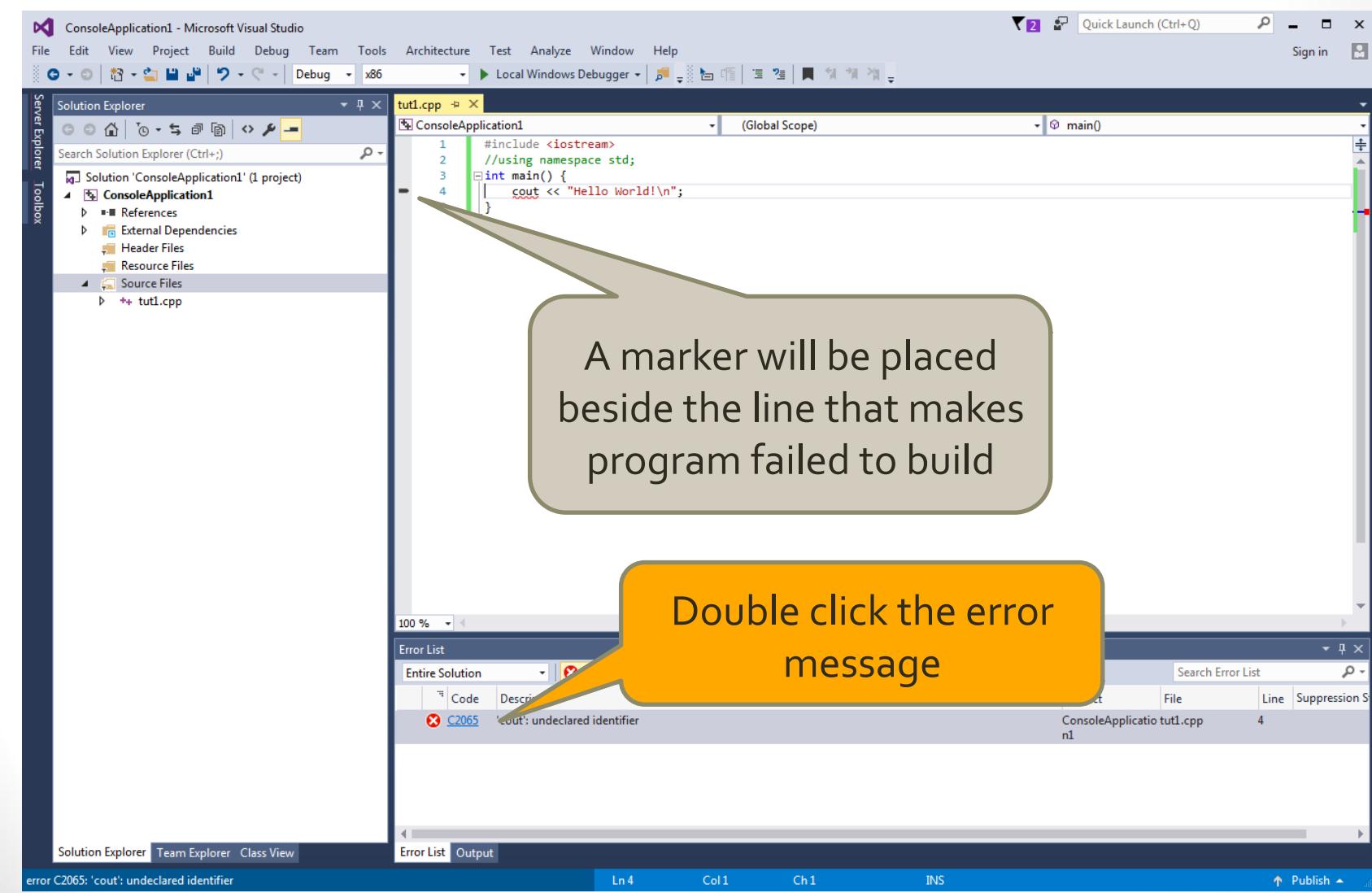
If you try to execute it anyway..



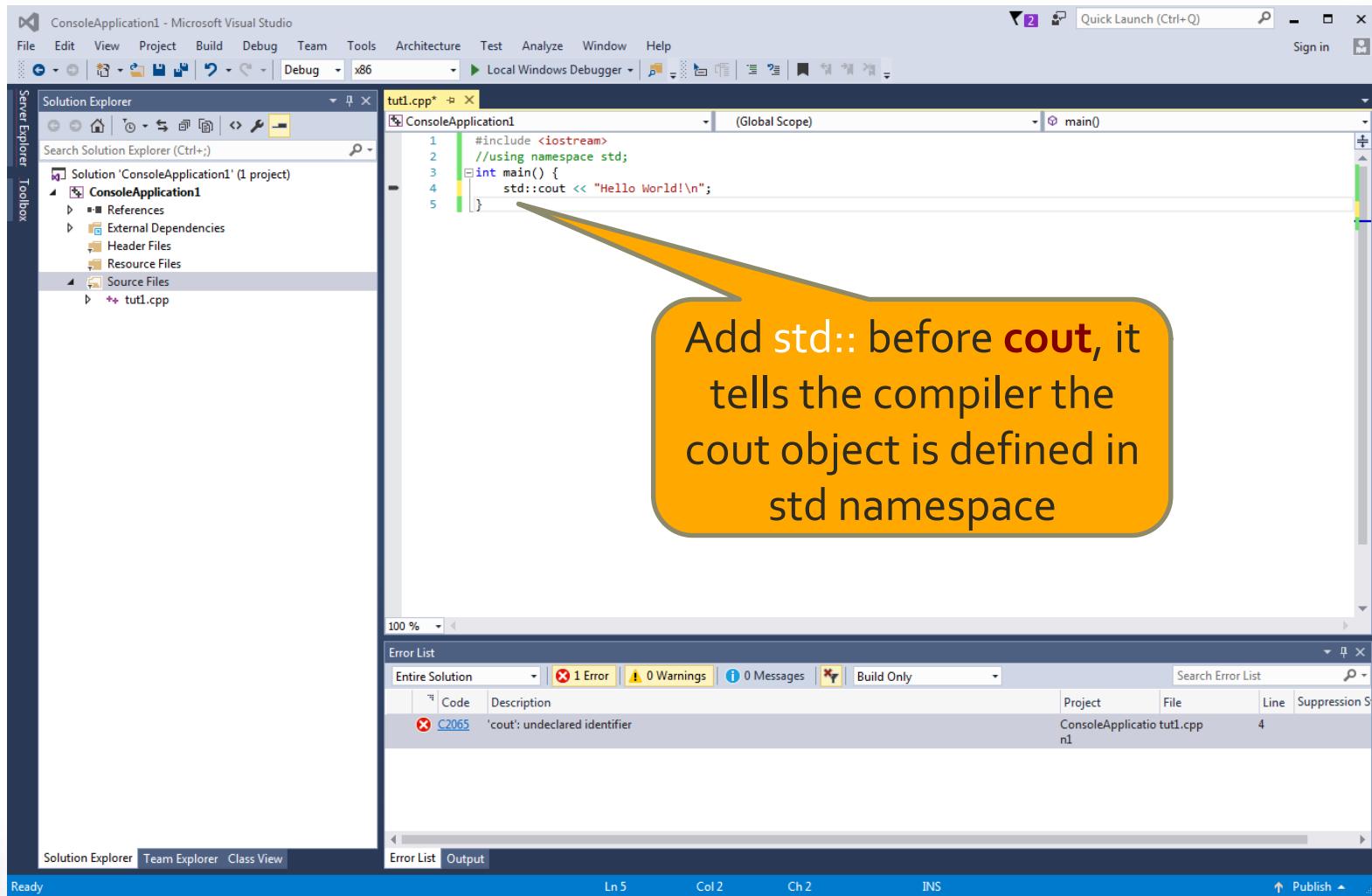
You will get an error message



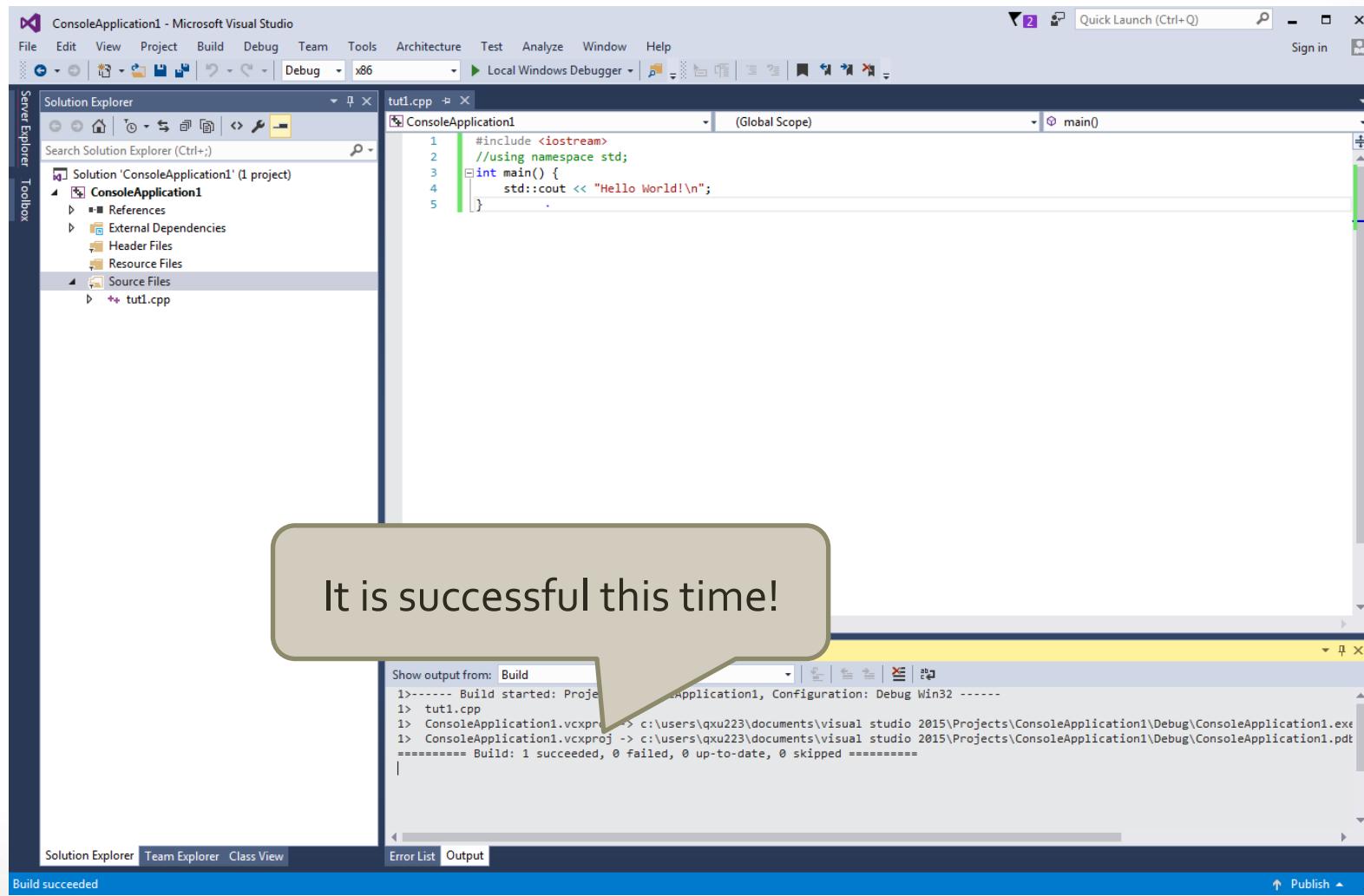
A better way: Locate the error



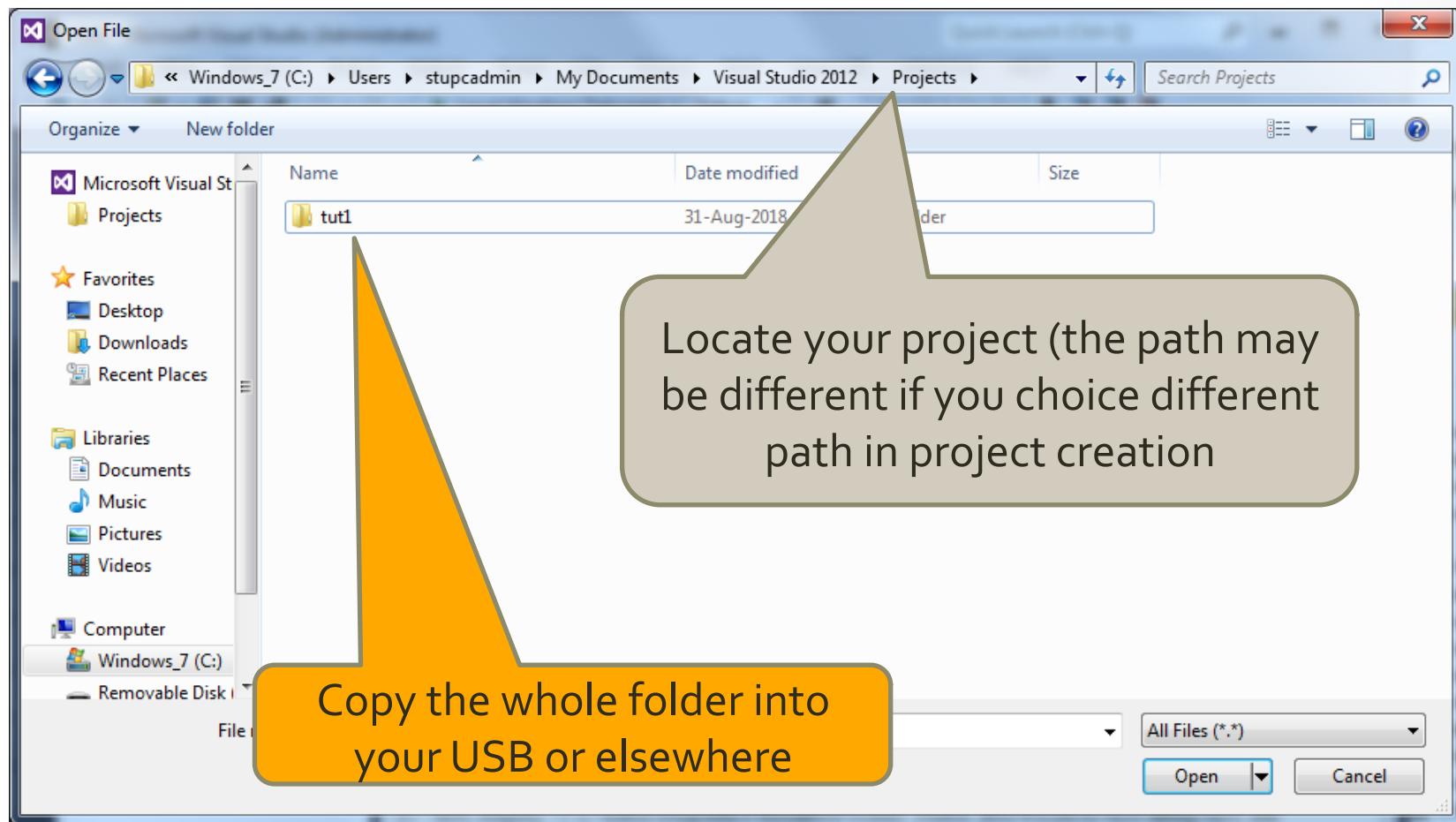
Fixed the error



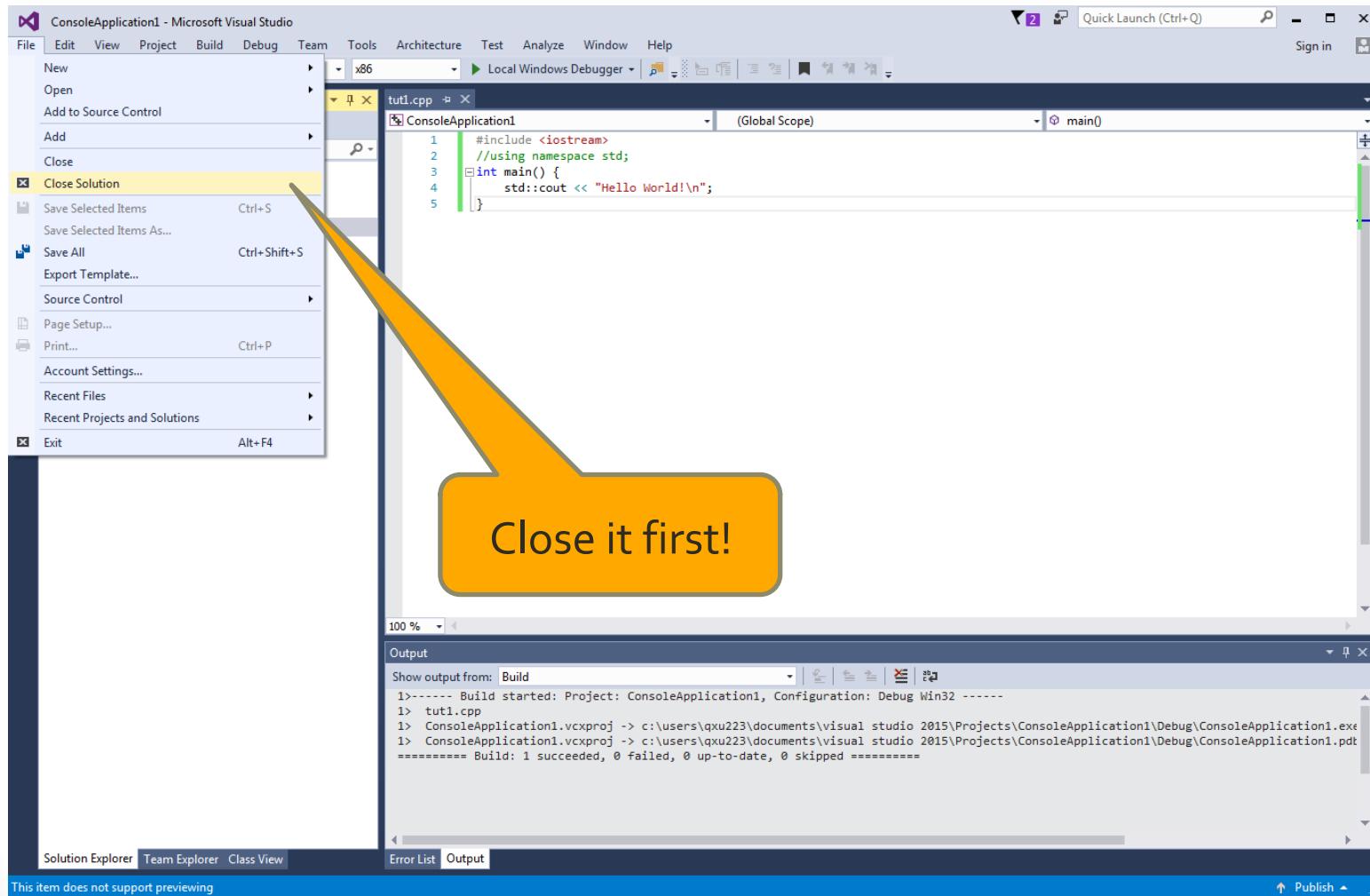
Rebuild the project: Fixed!



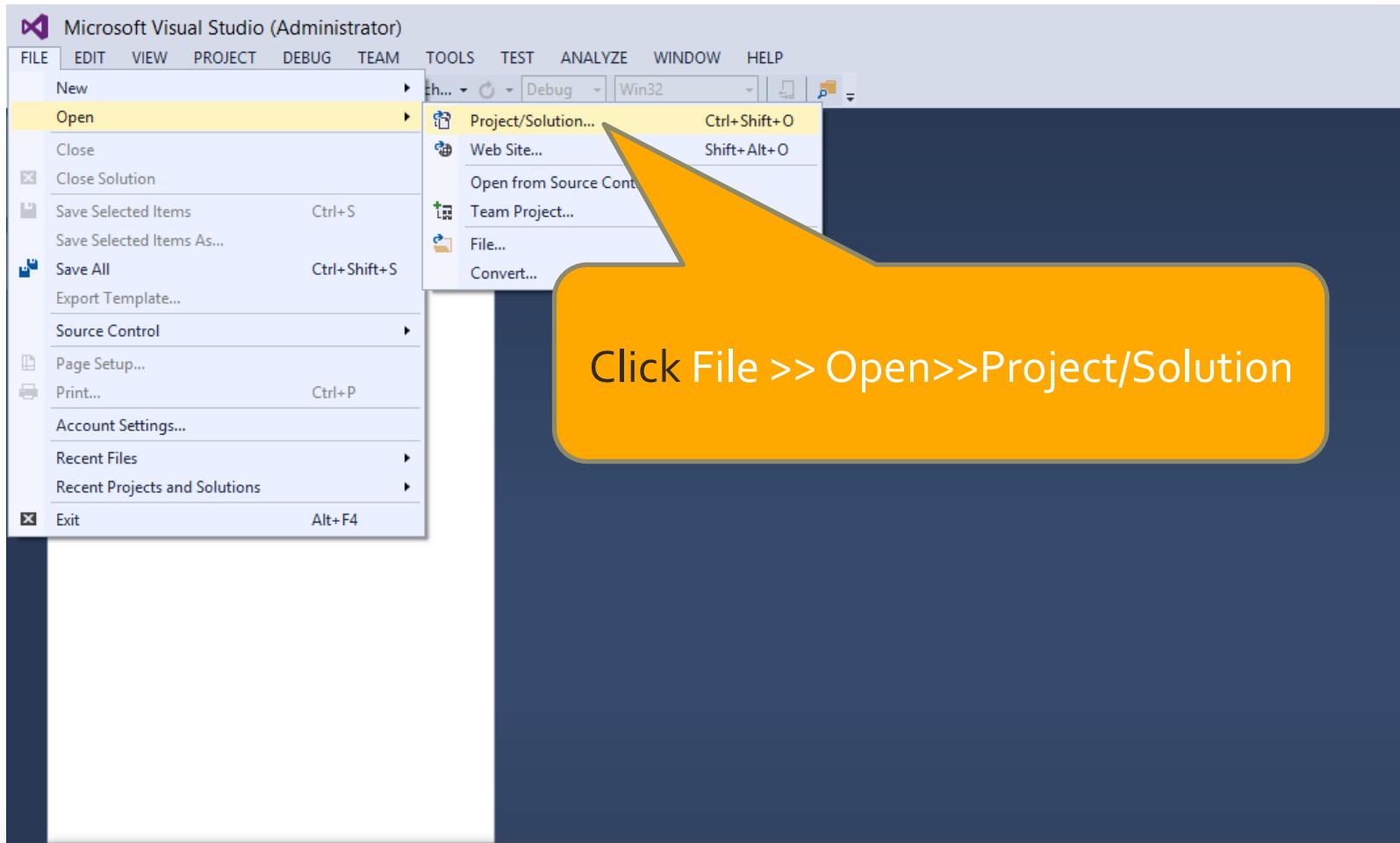
Copy your project out



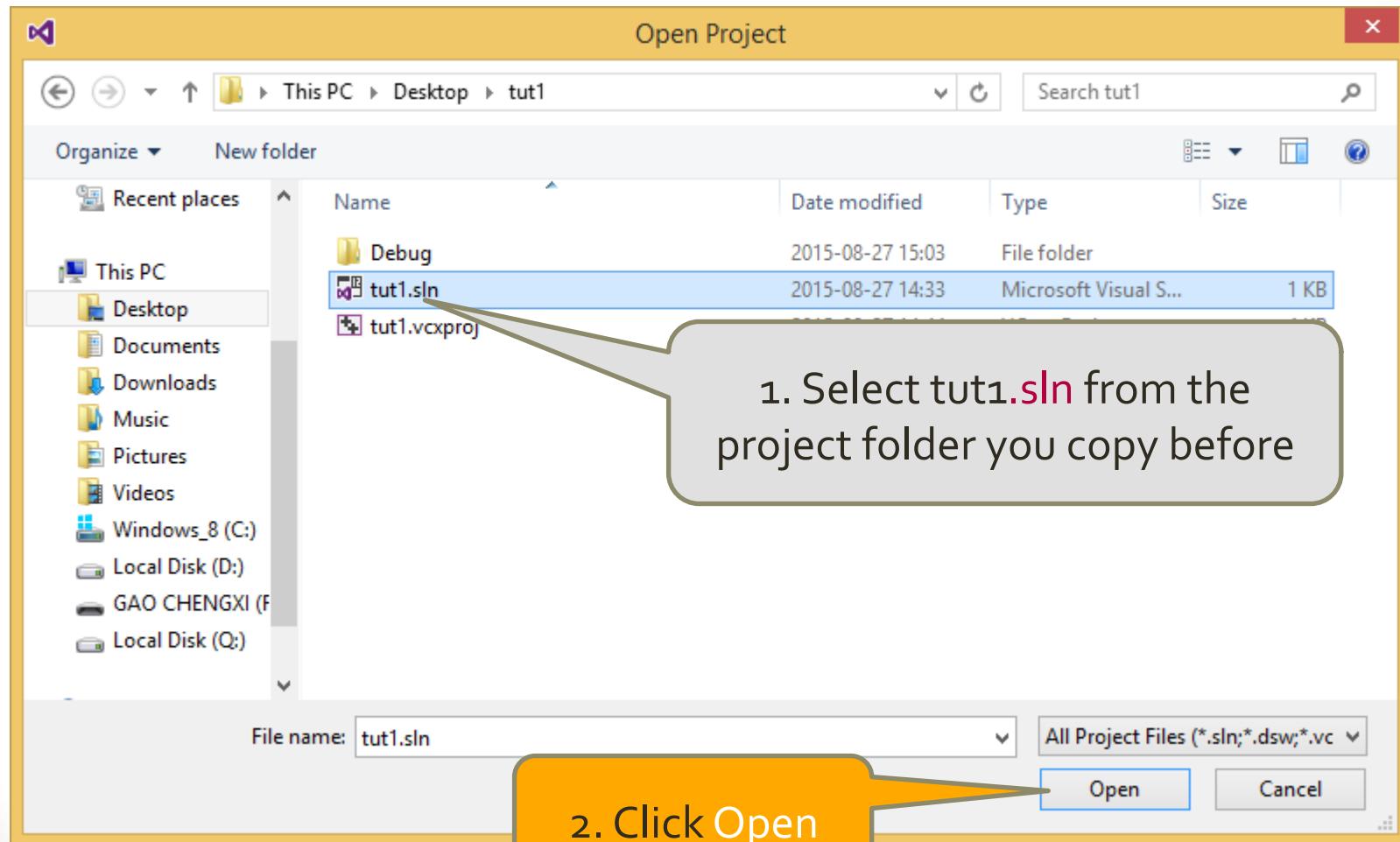
Reload your project



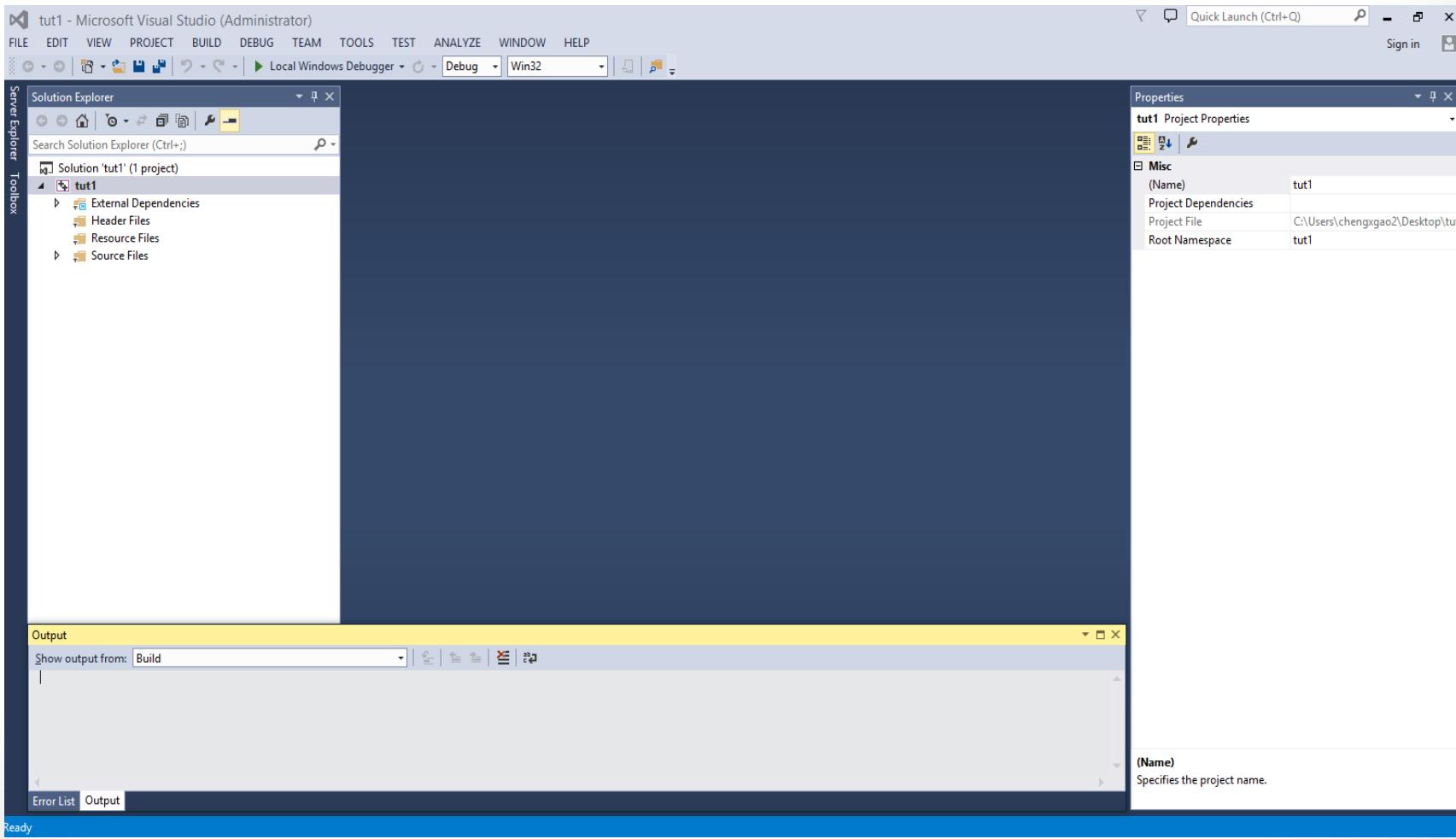
VS without project loaded



Locate and select your project

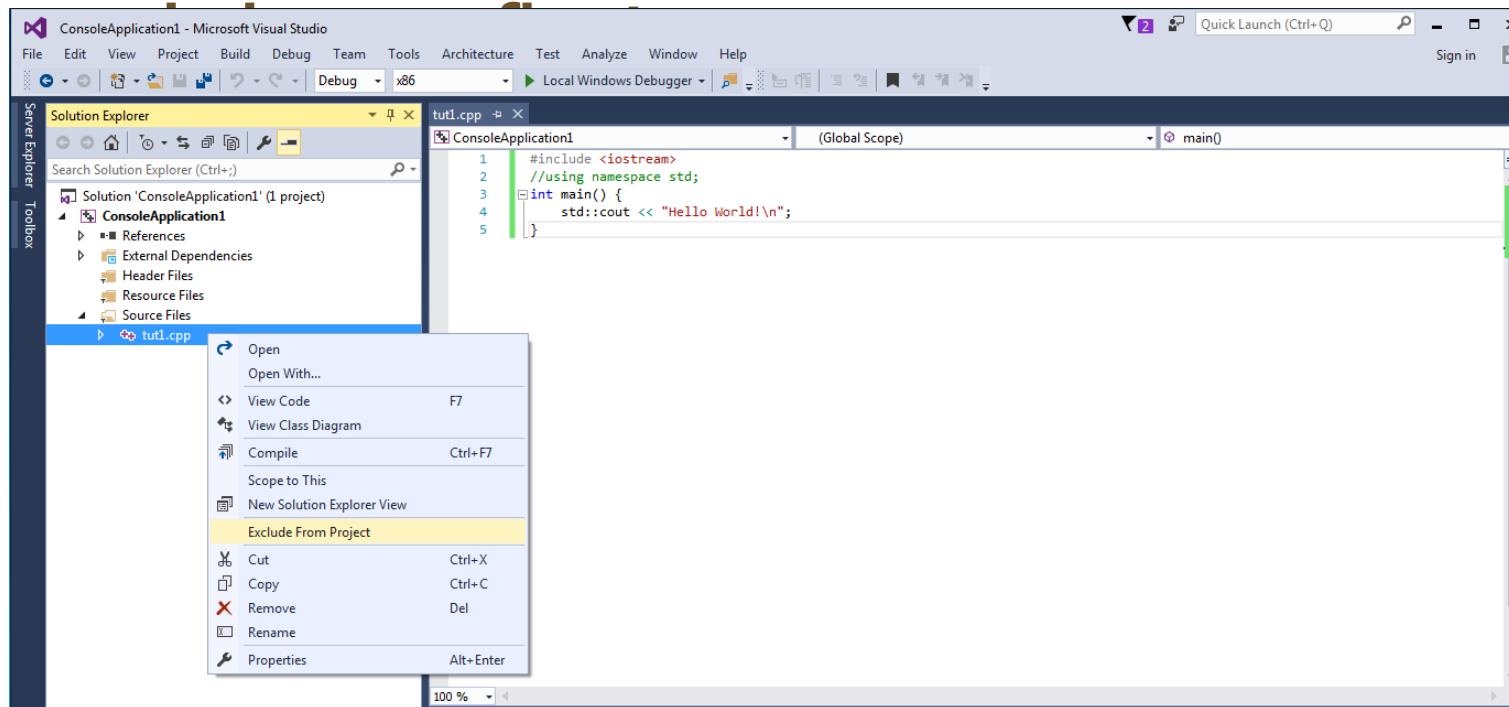


Your project is loaded



Work on other program with the same project

- Within the same project, we can only have one "main" function. If you want to add another program file with function main, exclude the file.



What you have done in this Tutorial

- Create a Visual Studio 2019 Project
- Create and add a C++ program into the project
- Write a simple Hello World Program
- Build and Execute the program
- Locate the syntax error of a program

Exercise – Output the following

In C++, "\\" indicates an escape sequence.

For example, "\\n" will output a new line, and "\\\" will output the backslash character "\\" itself.

Option 2

Install VS2019 on own PC/Windows 10

Downloading a Visual C++ 2019 compilers [for Windows 10]

- Visual Studio 2019 can be found at:
<http://msdnna.cs.cityu.edu.hk/>
- Note: The site may not work in some versions of Firefox
- Login using your CityU O365 account.
- Select Visual Studio Community 2019
- Download and run the executable files.
- Click setup to install.

Enter the MSDNAA Software Center

The screenshot shows a web browser window with the following details:

- Title Bar:** CityU CS MSDNAA Program
- Address Bar:** msdnna.cs.cityu.edu.hk
- Content Area:**
 - MSDNAA Software Distribution Policy:** A red header bar containing the title.
 - A black box with white text listing 5 rules:
 1. The distribution of MSDNAA software is restricted by the MSDNAA license agreement signed between the CS Department and CityU.
 2. MSDNAA software are distributed to full time teaching staff of the CS department and CityU students taking at least one course in the department.
 3. MSDNAA software can only be installed on computer(s) owned by legitimated MSDNAA users.
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 - Welcome Message:** "Welcome to the CityU CS MSDNAA".
 - List of Instructions:**
 - Introduction to the [Microsoft Imagine WebStore \(MSDNAA Program\)](#).
 - **Caution:** Each software can only be downloaded for **1 times**
 - Due to the huge file size (a few hundred mega bytes), please download at your own risk.
 - Software download procedures
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Click this

Select Visual Studio Community 2019

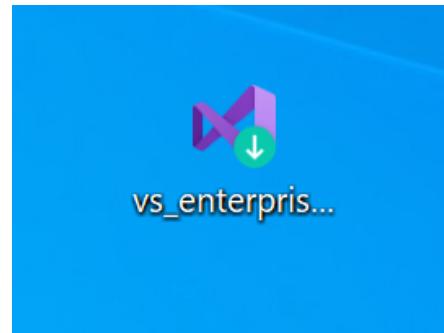
The screenshot shows the Microsoft Azure Education Software page. The top navigation bar includes 'Microsoft Azure', a search bar, and user information (csymong@um.cityu.edu...). Below the navigation is a breadcrumb trail: Home > Education | Software. On the left, there's a sidebar with 'Overview', 'Get started', 'Learning resources' (selected), 'Software' (selected), 'Learning', 'Need help?', and 'Student FAQ'. The main content area displays a search bar and filters for 'Product category : All', 'Operating System : All', 'System type : All', and 'Product language : English,Multilanguage'. A large orange callout box with the text 'Select Visual Studio Community 2019' is overlaid on the page. The table below lists five items:

Name ↑	Category ↑↓	Operating System ↑↓	System type ↑↓	Language ↑↓
Visual Studio 2019 for Mac	Developer Tools	Mac	64 bit	Multilanguage
Visual Studio Code	Developer Tools	Windows	64 bit	Multilanguage
Visual Studio Community 2019 (version 16.0)	Developer Tools	Windows	64 bit	Multilanguage
SQL Server 2019 Developer	Database	Windows	64 bit	English
Machine Learning Server 9.4.7 for Windows	AI + Machine Learning	Windows	64 bit	English

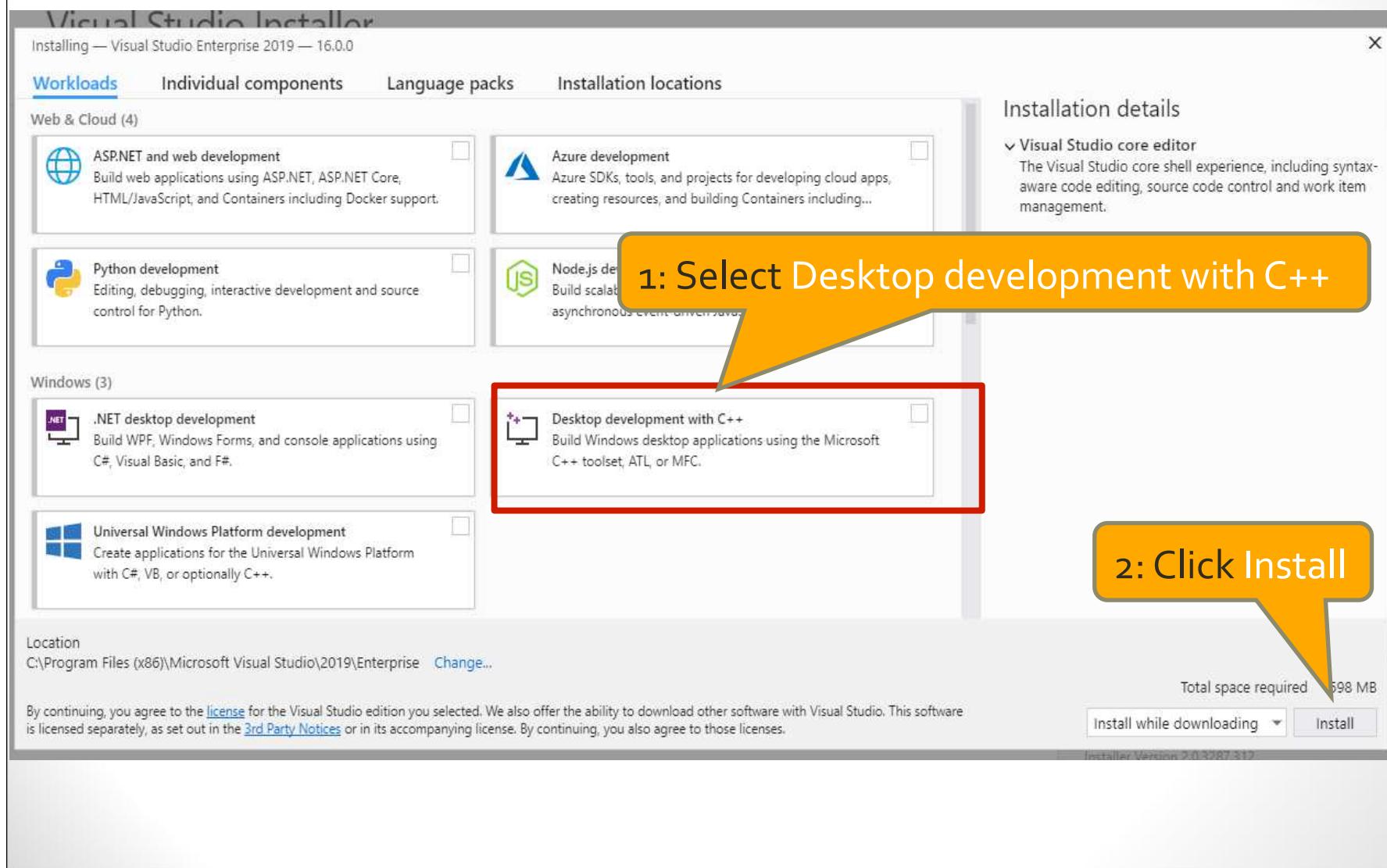
Select Visual Studio Community 2019

The screenshot shows the Microsoft Azure Education Software page. The left sidebar includes links for Overview, Get started, Learning resources (Software is selected), Learning, Need help?, and Student FAQ. The main content area displays a list of 5 items under the heading "Software". The items listed are: Visual Studio 2019 for Mac, Visual Studio Code, Visual Studio Community 2019 (version 16.0) (which is highlighted in blue), SQL Server 2019 Developer, and Machine Learning Server 9.4.7 for Windows. A modal window titled "Software" is open over the list, showing details for "Visual Studio Community 2019 (version 16.0)". The modal includes a product icon, a brief description, operating system requirements (Windows), product language (Multilanguage), system requirements (64 bit), and two buttons at the bottom: "Download" (highlighted in blue) and "Cancel". A yellow speech bubble points to the "Download" button with the text "Click Download".

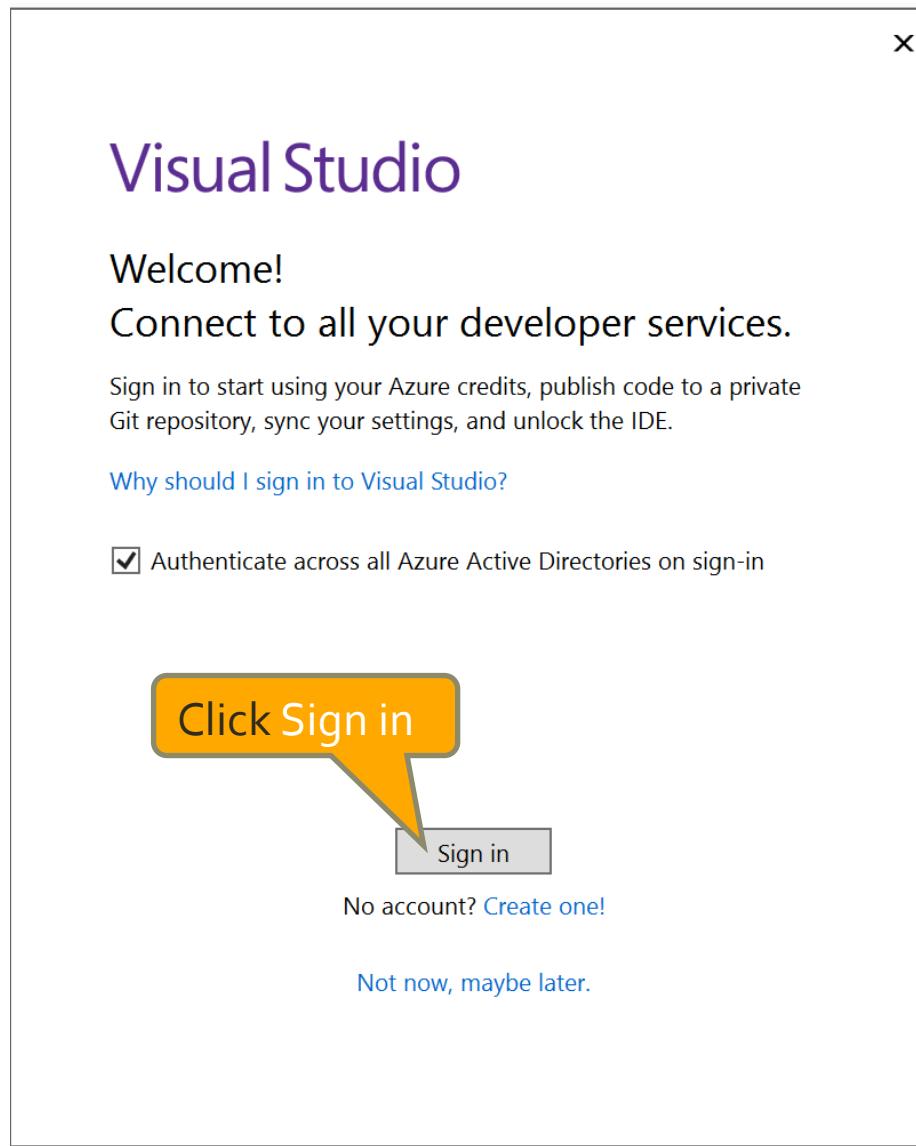
Run the downloaded executable file to obtain the Visual Studio Installer



Select useful workloads



Open VS2019 and Sign in with your CityU 360 account



Option 3 for Mac OS

Connect to CSLab Windows 10

Option 3

- Connect to CSLab to use VS2019 [for Mac]
 - Download & install Microsoft Remote Desktop
 - Run Microsoft Remote Desktop
 - Connect to rds16e.cs.cityu.edu.hk
 - Login with CityU e-id & password



CSLab Win 10 Apps Menu (rds16e) 08/2021

GE2324 Jupyter Notebook
GE2324 Octave 6.2.0
GE2324 Tanagra 1.4.50
GE2324 Weka 3.8.5
Microsoft SQL Server Management Studio 17.2 (For CS4281)
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Microsoft Visual Studio 2019 Enterprise
SQL Plus 11 (for CS3402)
SSH Secure FTP 3.2.9
SSH Secure Shell Client 3.2.9
Unity 5.6.5f1 (64-bit) (for CS3347)
VirtualBox 6.1.18

For Linux users

As for Linux users, you can use CLion, which is a Cross-Platform IDE for C and C++ by JetBrains. Students can get the education support by registering with school email for free use of CLion. (**recommended.**)

Another alternative is Visual Studio Code:

Reference: <https://code.visualstudio.com/docs/languages/cpp>
<https://code.visualstudio.com/docs/editor/debugging>

It is also very convenient to use command line with g++ to compile and run .cpp files.

Details could be found in the (optional) references on Canvas