

CSC 3210

Computer Organization and Programming

Lab Work 5

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Learning Objective

- Listing File Format

Lab Work 5 Instructions

- Lab 5 : Create a project and generate listing file (10 points)
- Detailed instructions are in Slide 37 and 38

Due Date: Posted on iCollege

Disclaimer!

- The process shown in these slides might not work in every single computer due to Operating system version, Microsoft Visual Studio versions and everything.
- If you find any unusual error, you can inform the instructor
- Instructor will help you resolve the issue.

Attendance!

How to create a

Listing File

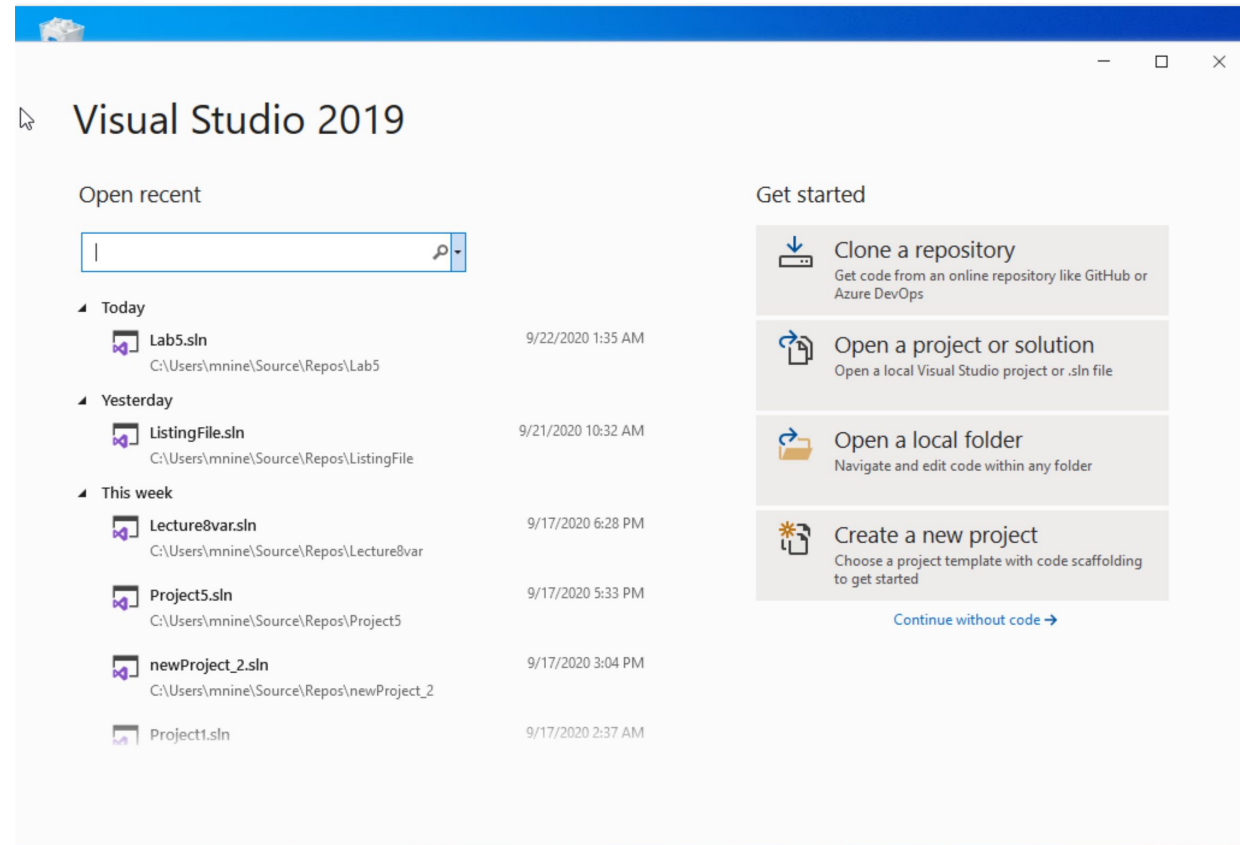
in Microsoft Visual Studio

Steps to follow

- Step 1: Create a new project
- Step 2: Configure settings for listing file
- Step 3: Build project
- Step 4: Open listing file

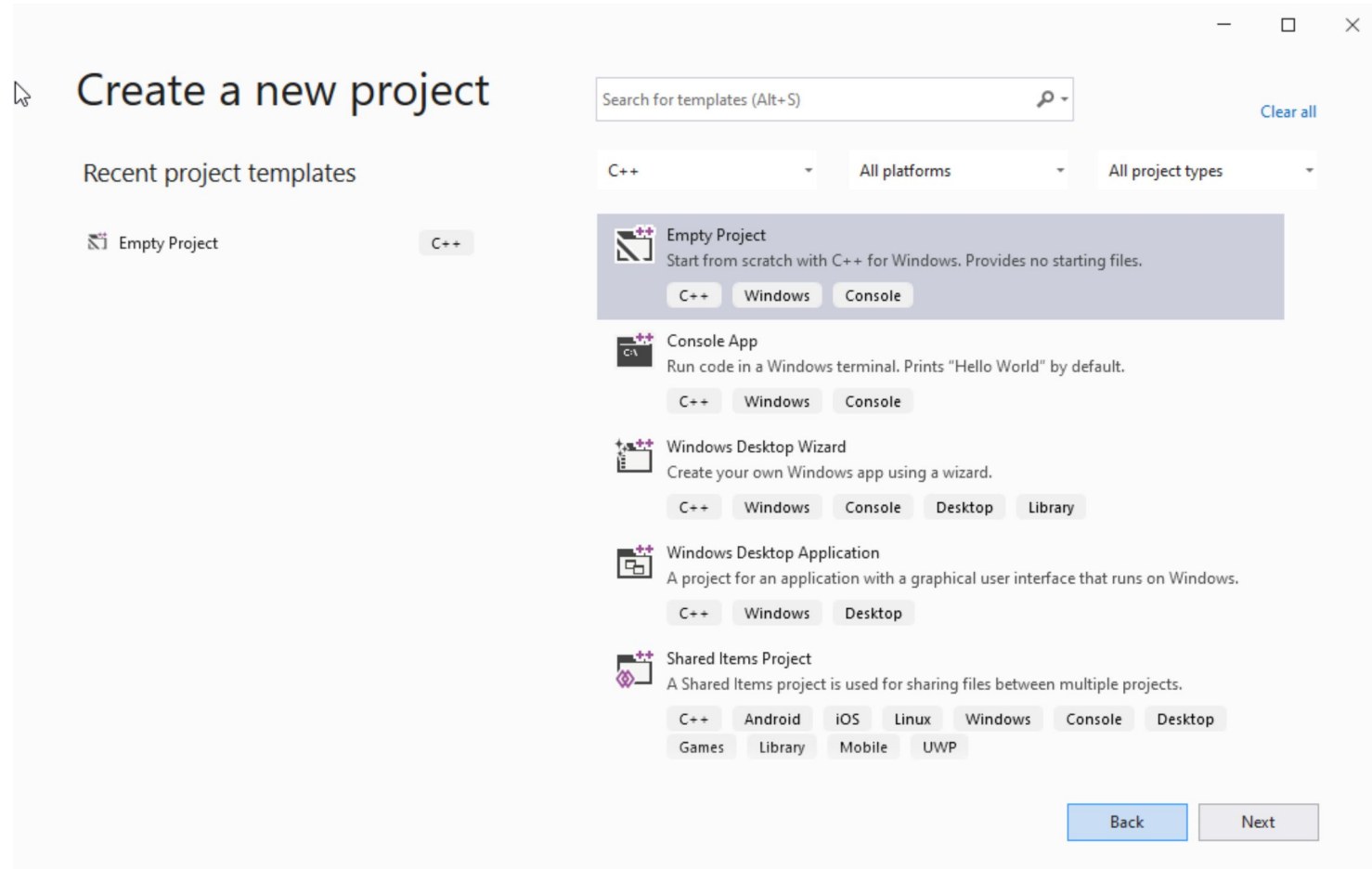
Step 1: Create a project (1)

- (1) Start Visual Studio
- (2) Click Create a new Project



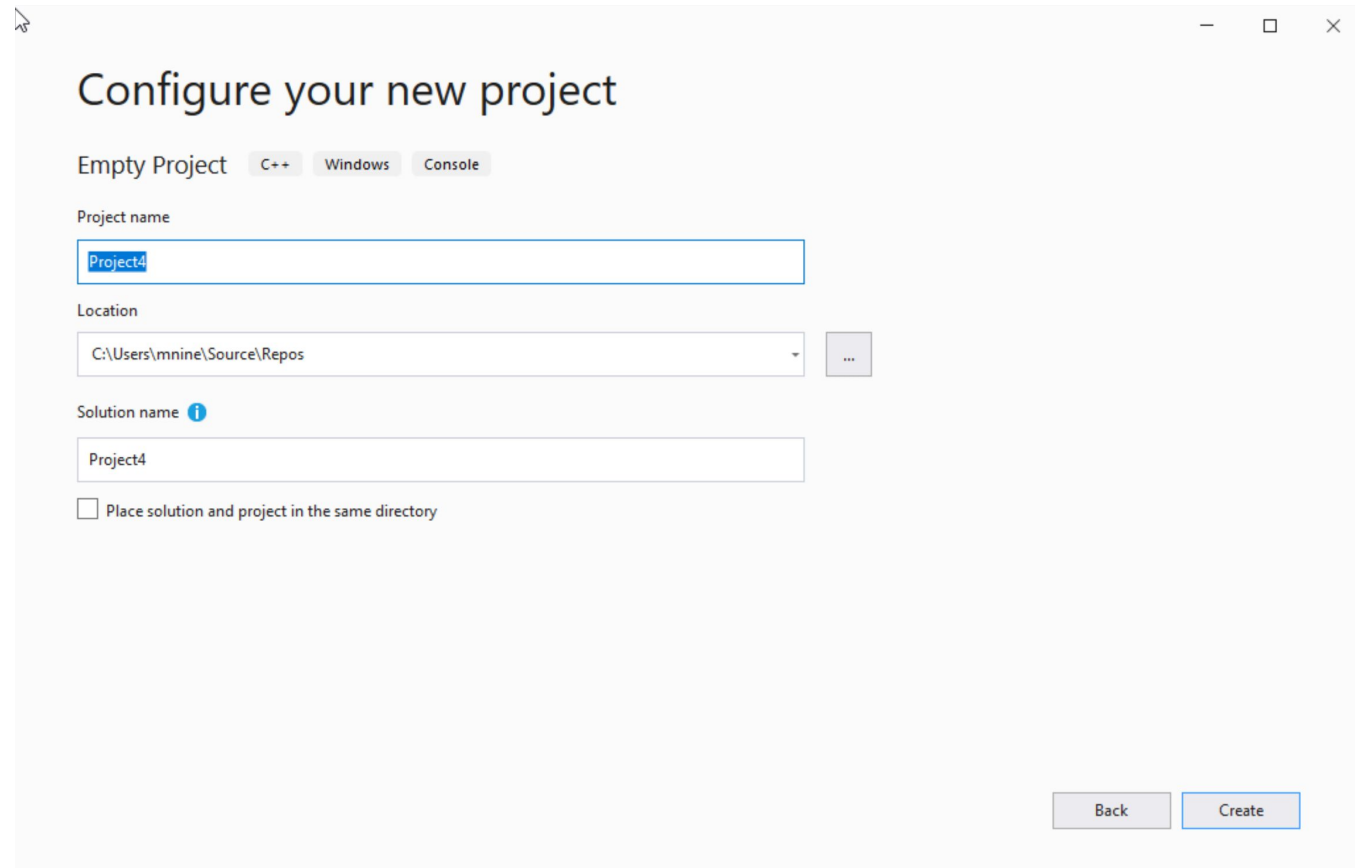
Step 1: Create a project (2)

- (1) Select C++ as language
- (2) Select Empty Project
- (3) Click Next



Step 1: Create a project (3)

- (1) You can change the project name as you like
- (1) Also, you can change the project location
- (2) Click Next



The screenshot shows the 'Configure your new project' dialog box in Visual Studio. The title bar includes standard window controls. The main heading is 'Configure your new project'. Below it, there are tabs for 'Empty Project', 'C++', 'Windows', and 'Console'. The 'Empty Project' tab is selected. The 'Project name' field contains 'Project4'. The 'Location' field shows the path 'C:\Users\mnine\Source\Repos' with a browse button ('...') to its right. The 'Solution name' field, which has an information icon, also contains 'Project4'. At the bottom, there is a checkbox labeled 'Place solution and project in the same directory' which is currently unchecked. At the bottom right, there are 'Back' and 'Create' buttons.

Step 1: Create a project (4)

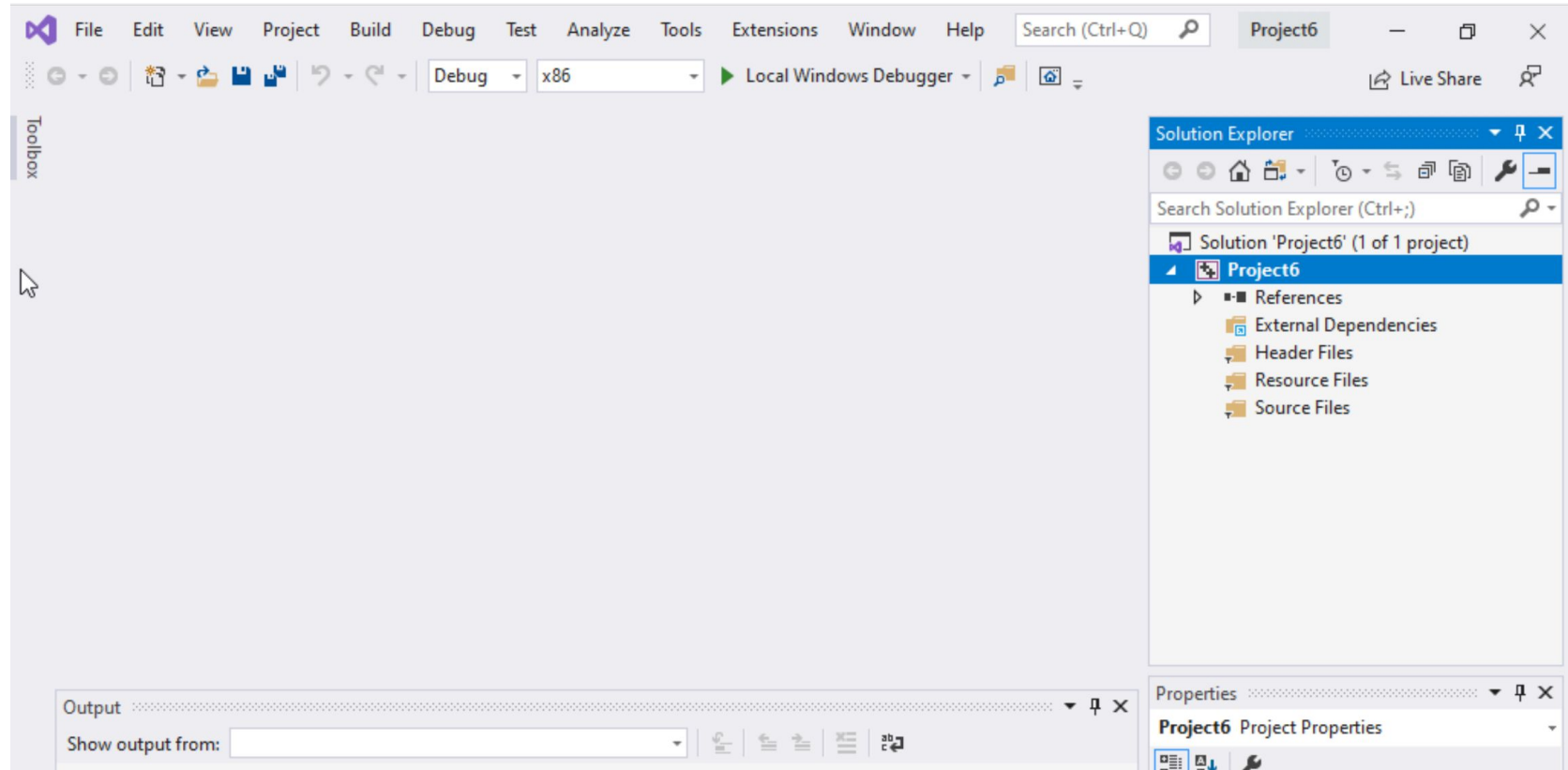
Delete the

Following folders:

- Header files

- Resources Files, and

- Source Files



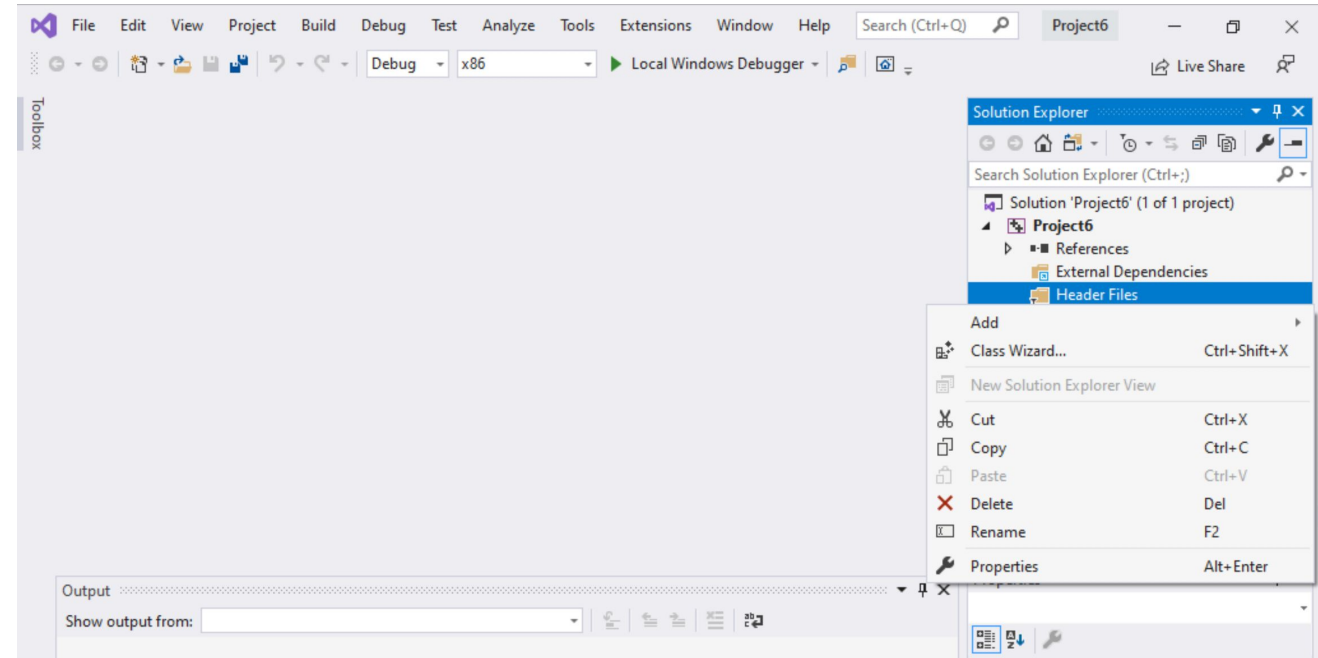
Step 1: Create a project (5)

To delete :

Select the folders

Right click on it

Select delete



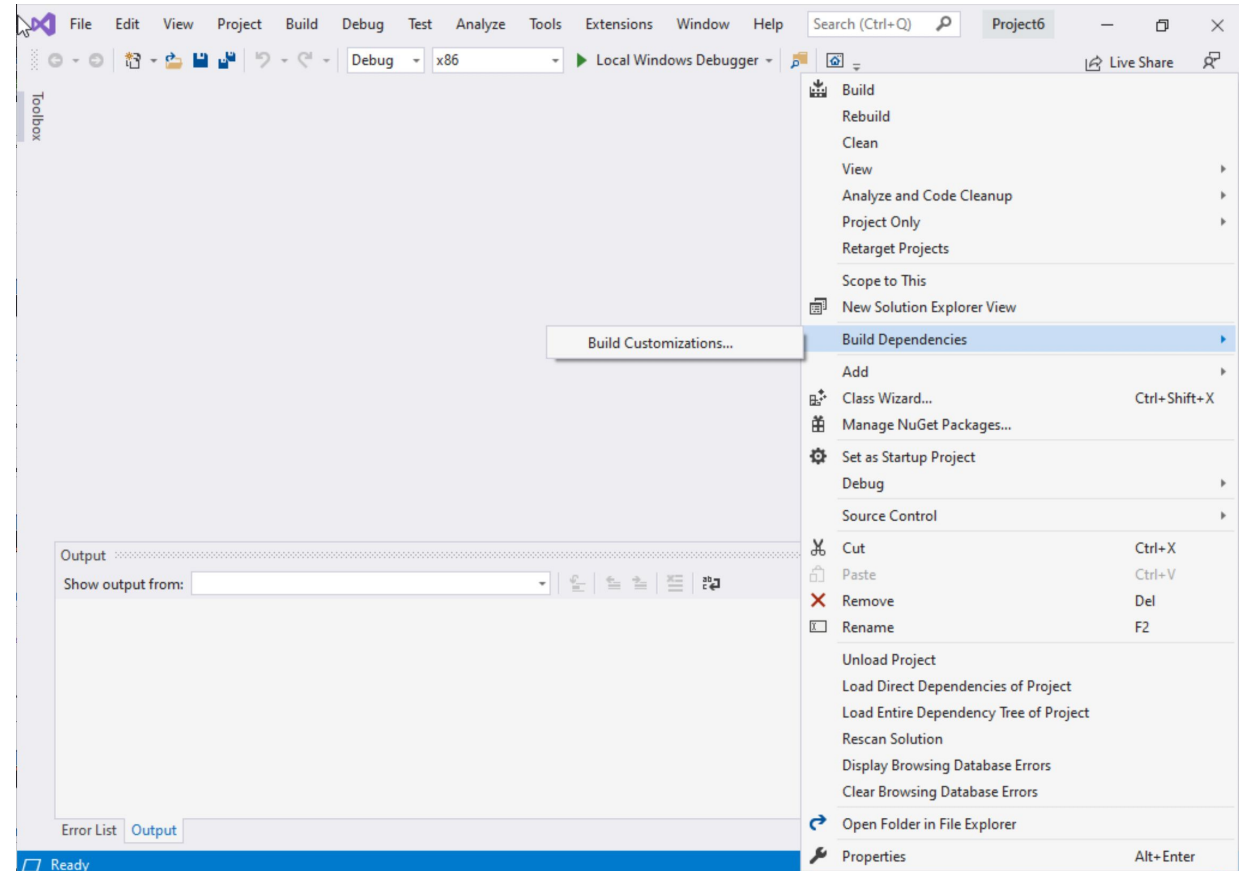
Step 1: Create a project (6)

Select Project Name on solution explorer

Right click on it

Go to Build Dependencies

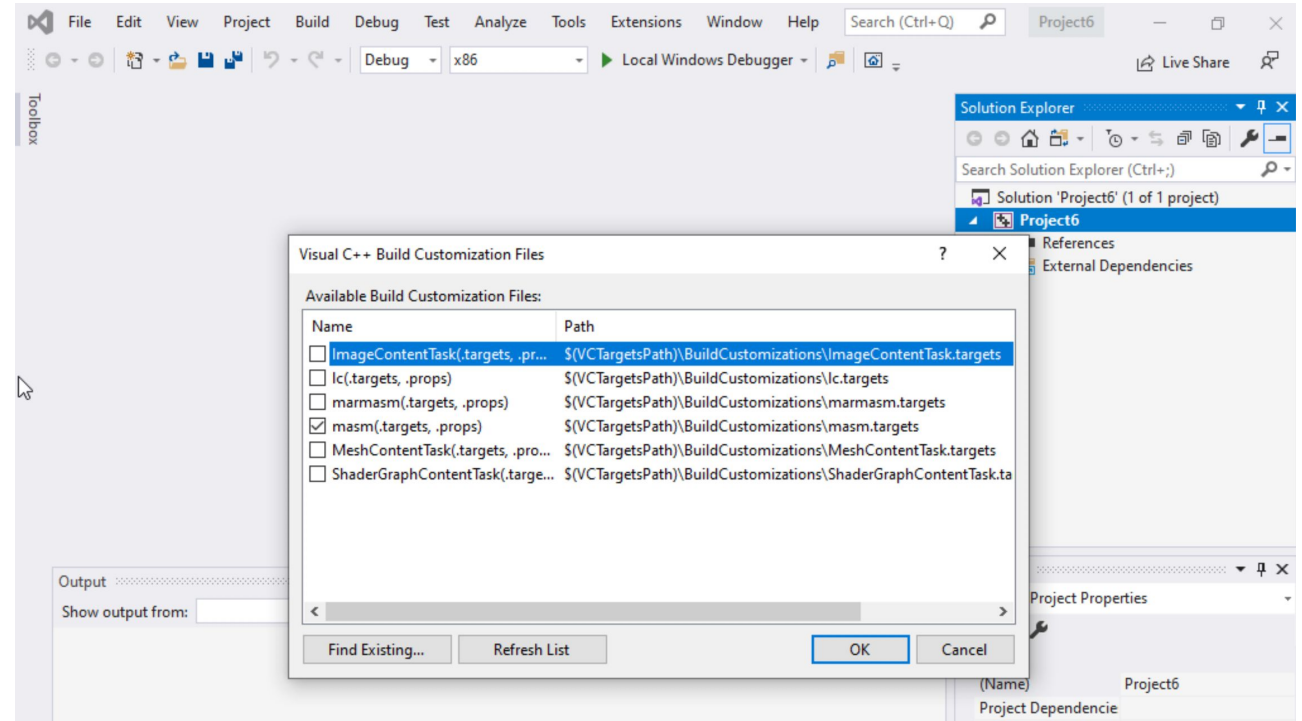
Click on Build Customizations



Step 1: Create a project (7)

Select masm(.target, .props)

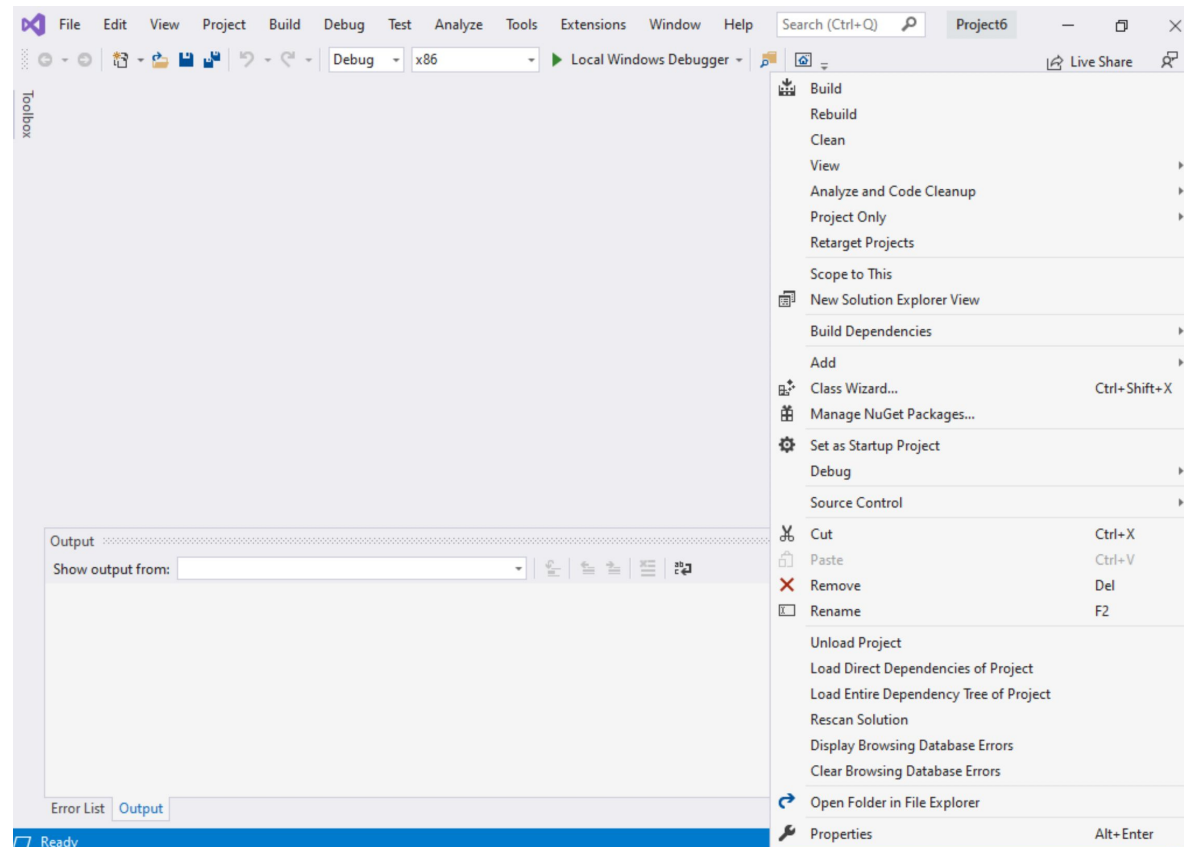
Click ok



Step 1: Create a project (8)

Right click on the Project name in the solution explorer

Click properties



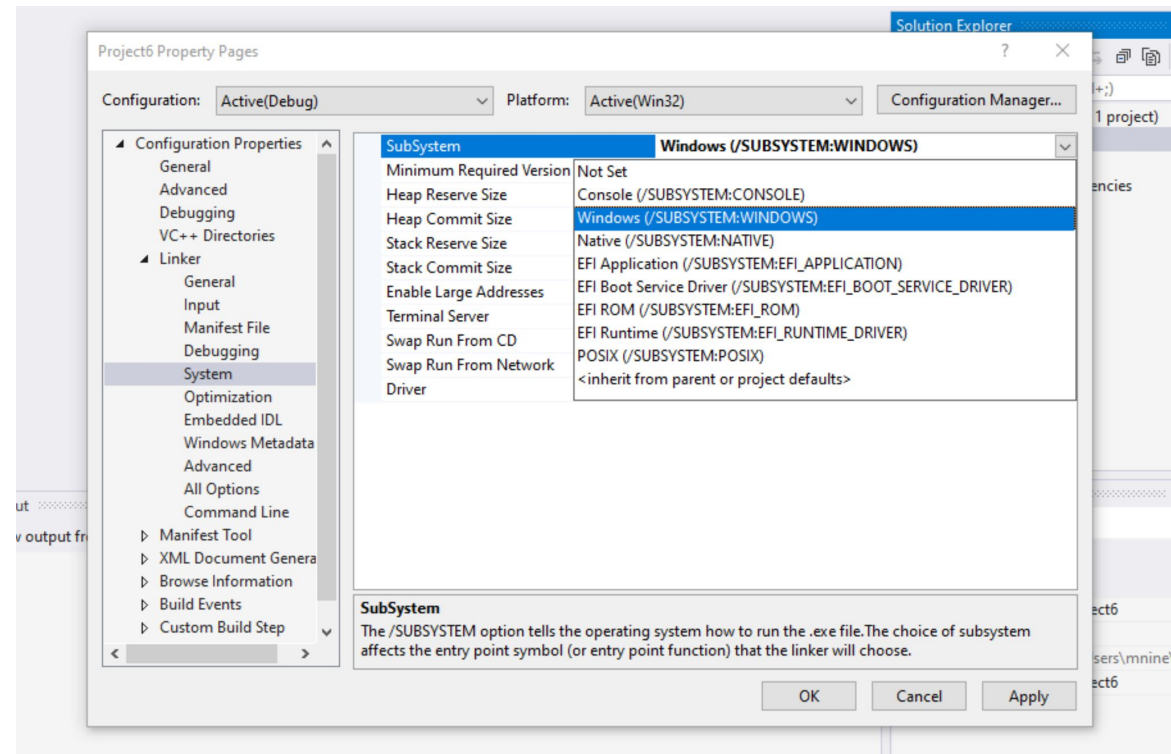
Step 1: Create a project (9)

Expand the 'Linker'

Select 'System'

Select Windows(/SUBSYSTEM:WINDOWS)

Click OK



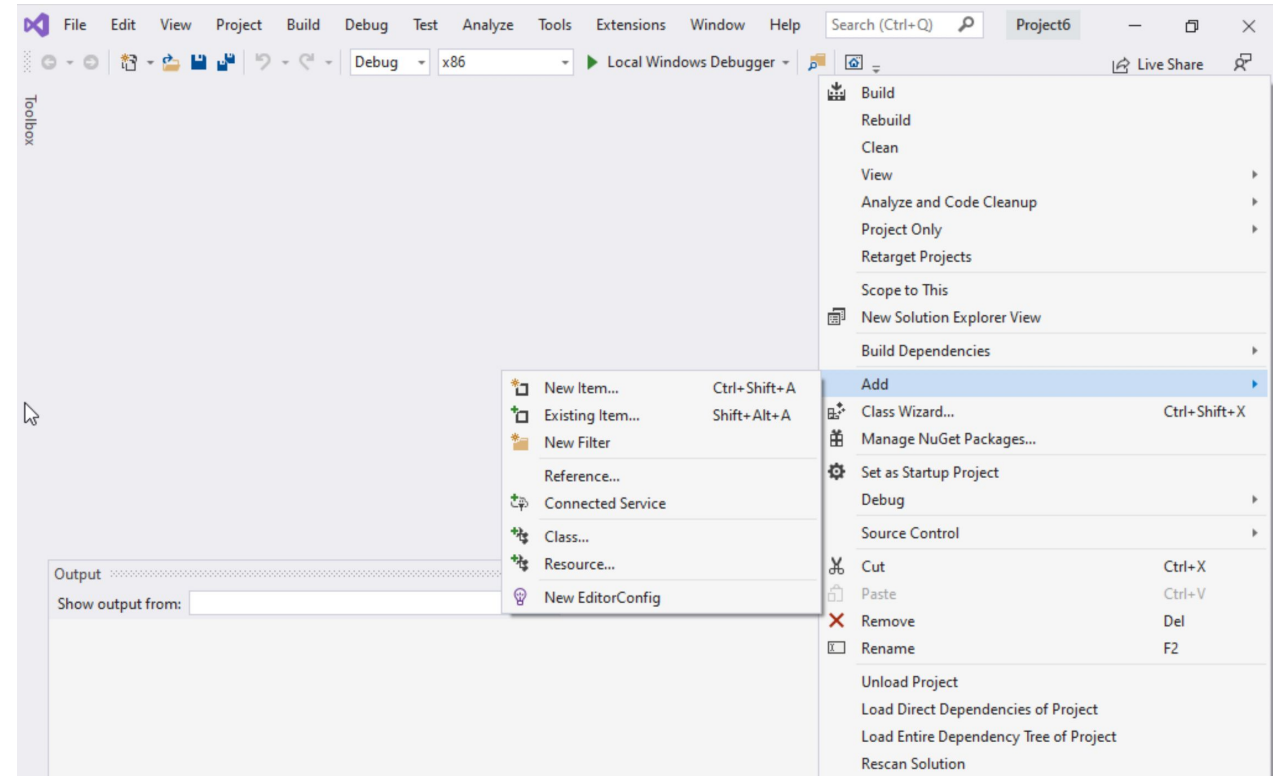
Step 1: Create a project (10)

Select Project name on solution explorer

Right click on it

Expand Add

Choose New Item

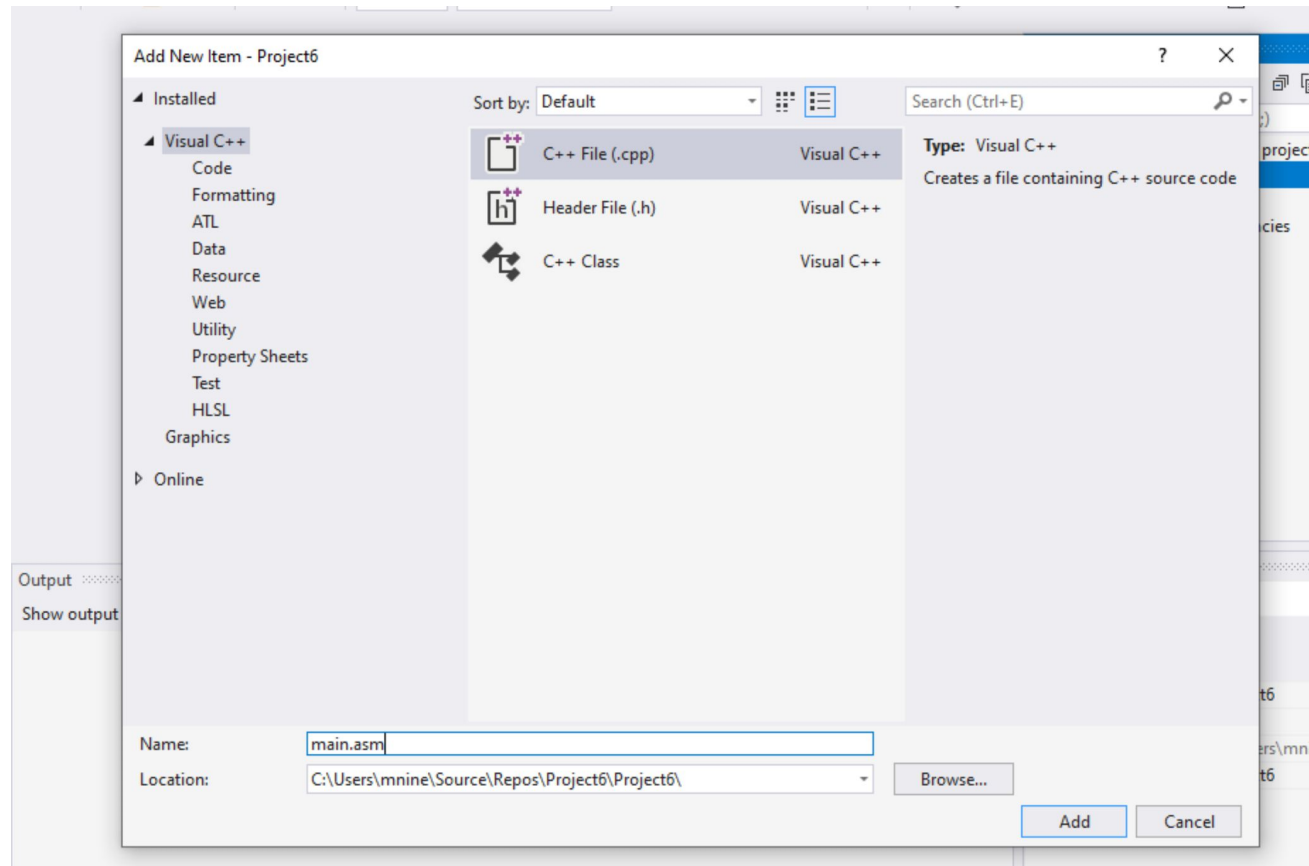


Step 1: Create a project (11)

Select C++ File(.cpp)

Name: main.asm

Click Add

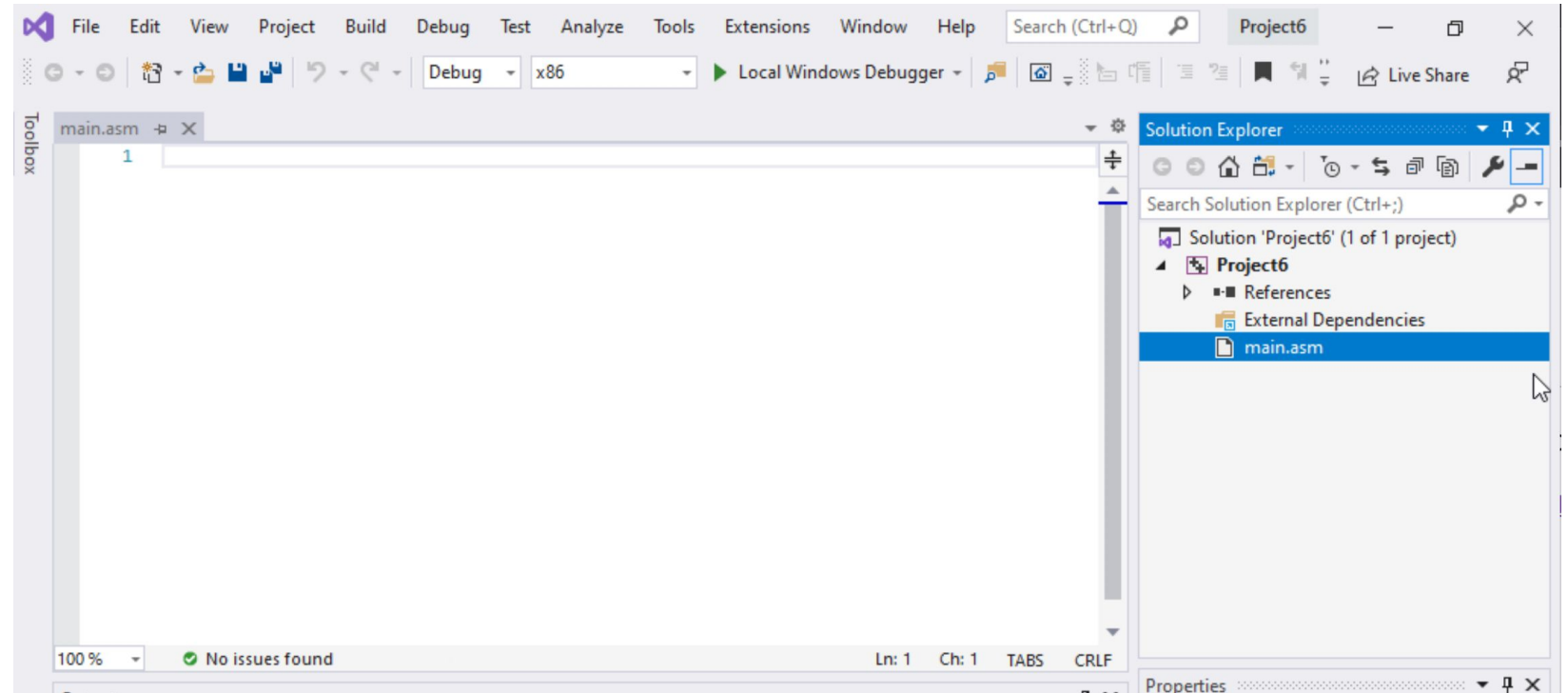


Step 1: Create a project (12)

Select main.asm

Add your code

In the main.asm File.



Sample Code

Type the sample code in the main.asm

```
.386
.model flat, stdcall
.stack 4096

ExitProcess PROTO, dwExitCode:DWORD

.code
main PROC
    mov eax, 5
    add eax, 6

    INVOKE ExitProcess, 0
main ENDP
END main
```

Listing File

- Contains
 - **source code**
 - **addresses**
 - **object code** (machine language)
 - **segment names**
 - symbols (names of : variables, procedures, and constants)
 - The **format** of the list file lines is

line#	offset	machine-code	nesting-level	source-line
11:	00000000	B8 00000005		mov eax,5

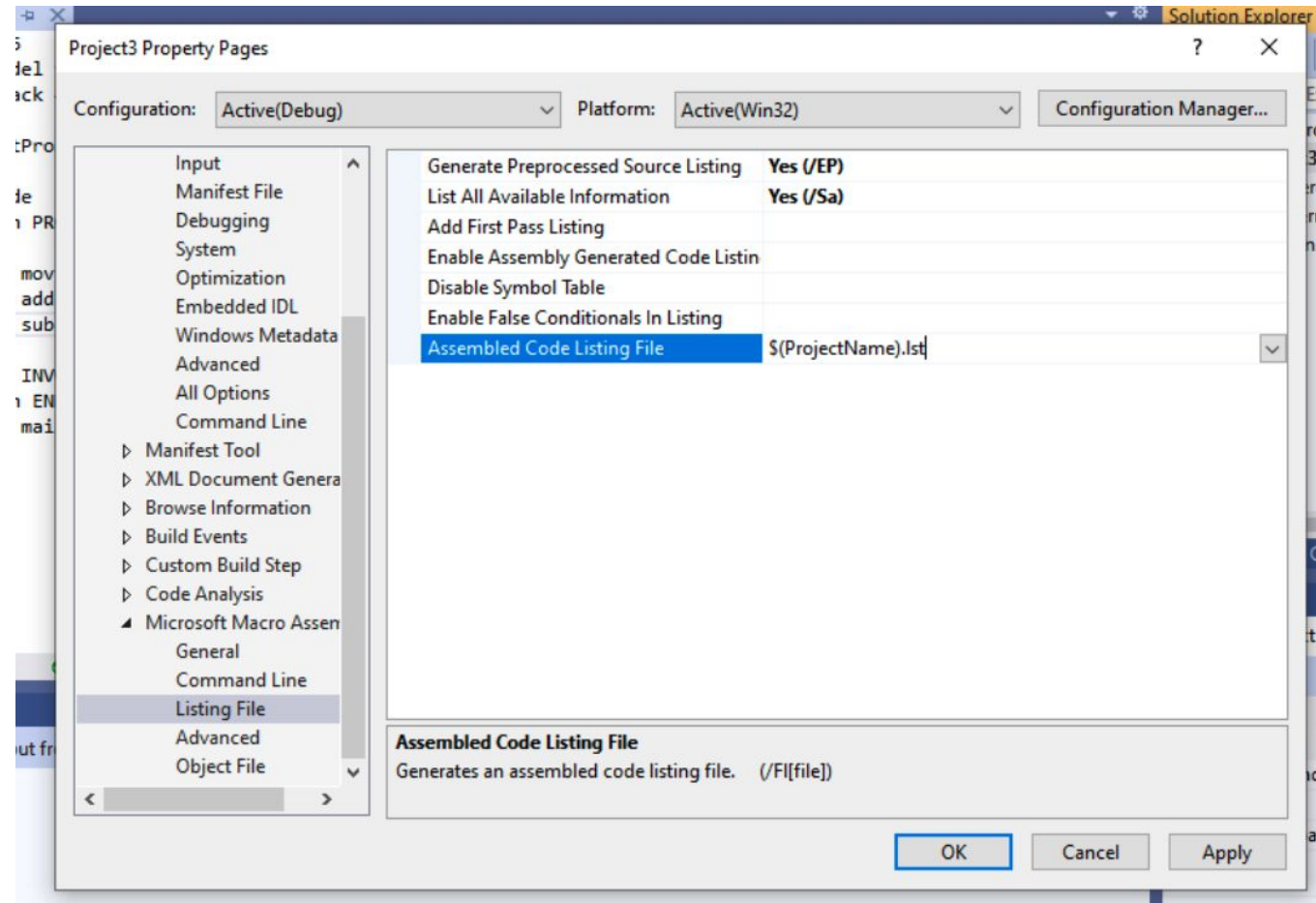
Listing File

FIGURE 3-8 Excerpt from the AddTwo source listing file.

```
1:      ; AddTwo.asm - adds two 32-bit integers.
2:      ; Chapter 3 example
3:
4:      .386
5:      .model flat,stdcall
6:      .stack 4096 segment
7:      ExitProcess PROTO,dwExitCode:DWORD
8:
9:      00000000
10:     00000000
11:     00000000
12:     00000005
13:
14:
15:     00000008
16:     0000000A
17:     0000000F
18:
    B8 00000005
    83 C0 06
    6A 00
    E8 00000000 E
    .code
main PROC
    mov     eax,5
    add     eax,6
    invoke  ExitProcess,0
    push    +0000000000h
    call    ExitProcess
main ENDP
END main
```

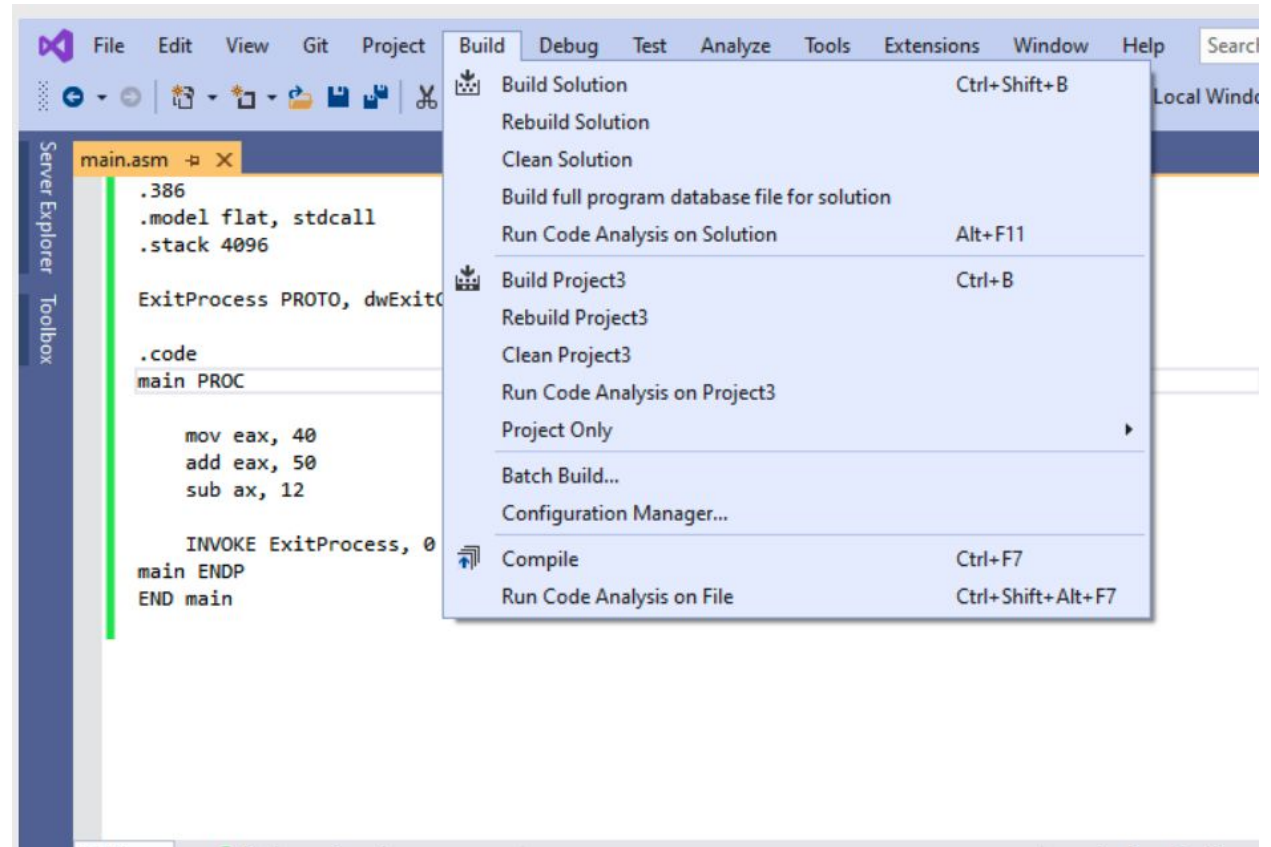
Listing File

- Configuring Visual Studio to generate a listing file.
 - Select Properties from the Project menu.
 - Under Configuration Properties, select Microsoft Macro Assembler.
 - In the dialog window,
 - set Generate Preprocessed Source Listing to Yes,
 - set List All Available Information to Yes.
 - Write \$(ProjectName).lst in Assembled Code Listing File



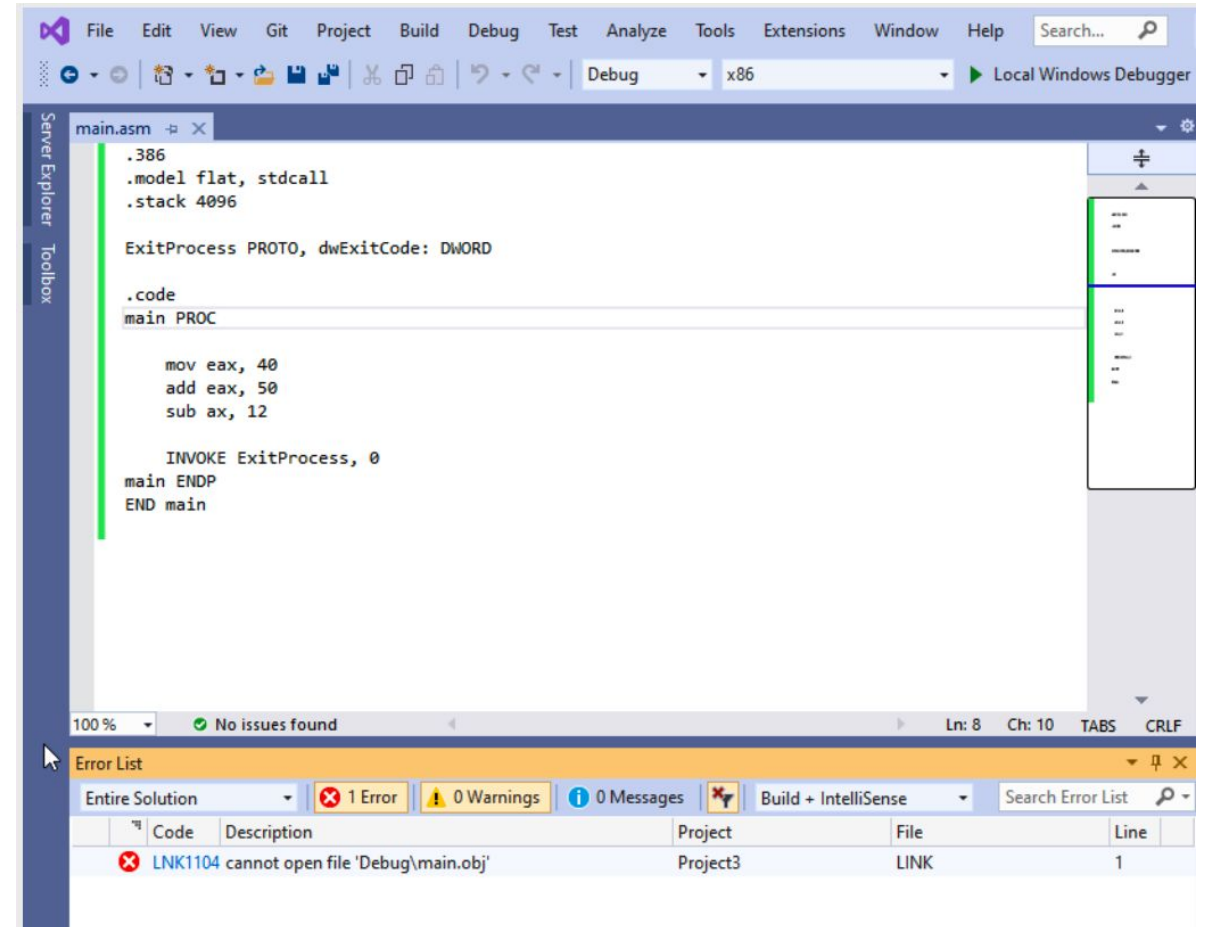
Step 3 : Build the Project

- Go to Build tab
 - Click 'Build Project'
- It is always better to clean the project before building it
- To clean the project
 - Go to build tab
 - Click 'Clean project'



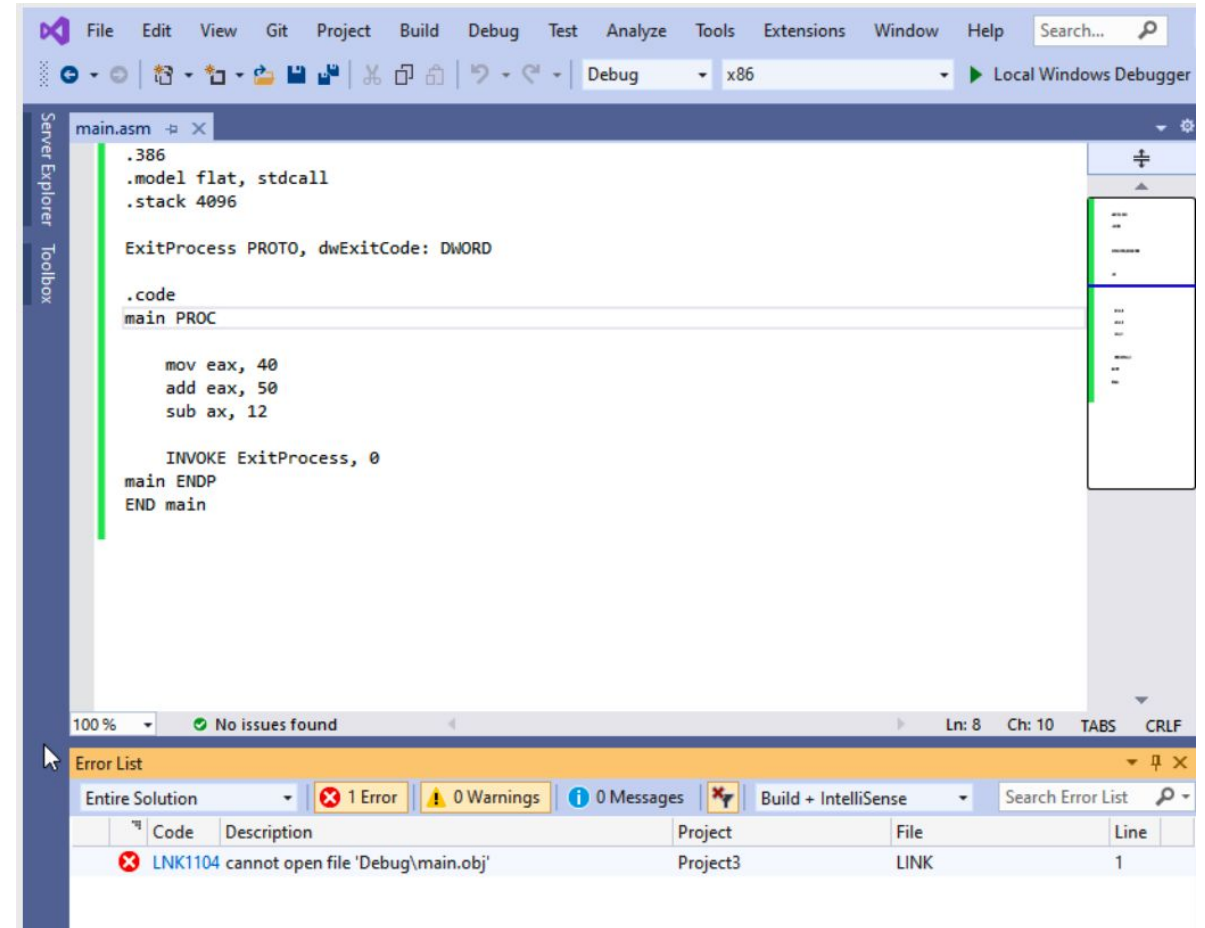
IF you see this error!

- Error: LNK 1104: Cannot open file 'Debug/main.obj'
- **Follow Steps from slide 25 to 32**



IF you see this error!

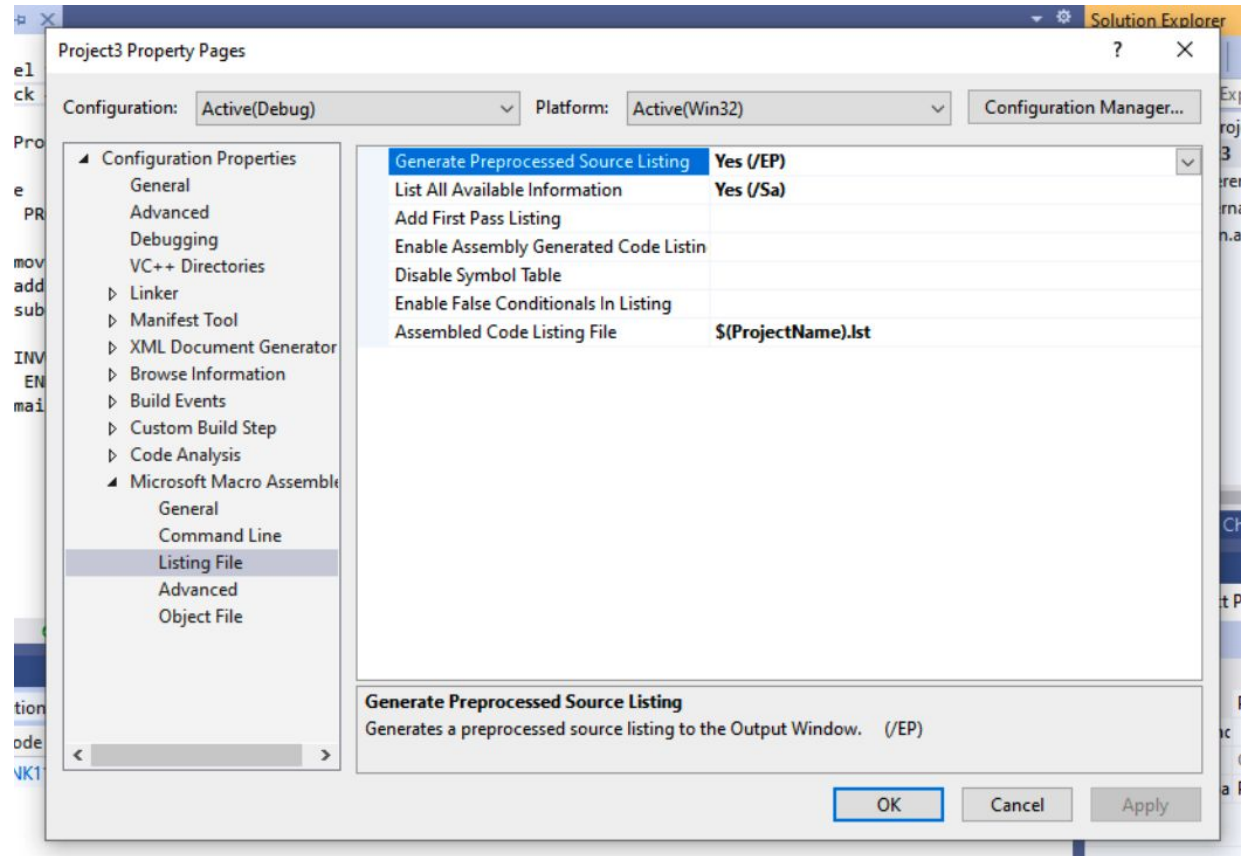
- Error: LNK 1104: Cannot open file 'Debug/main.obj'
- Solution:
 - Delete the listing file settings from configuration
 - Clean the project
 - Build the project again
 - Then re-enter the listing file settings
 - Clean the project
 - Build again



Error Fix:

1. Delete listing file configuration

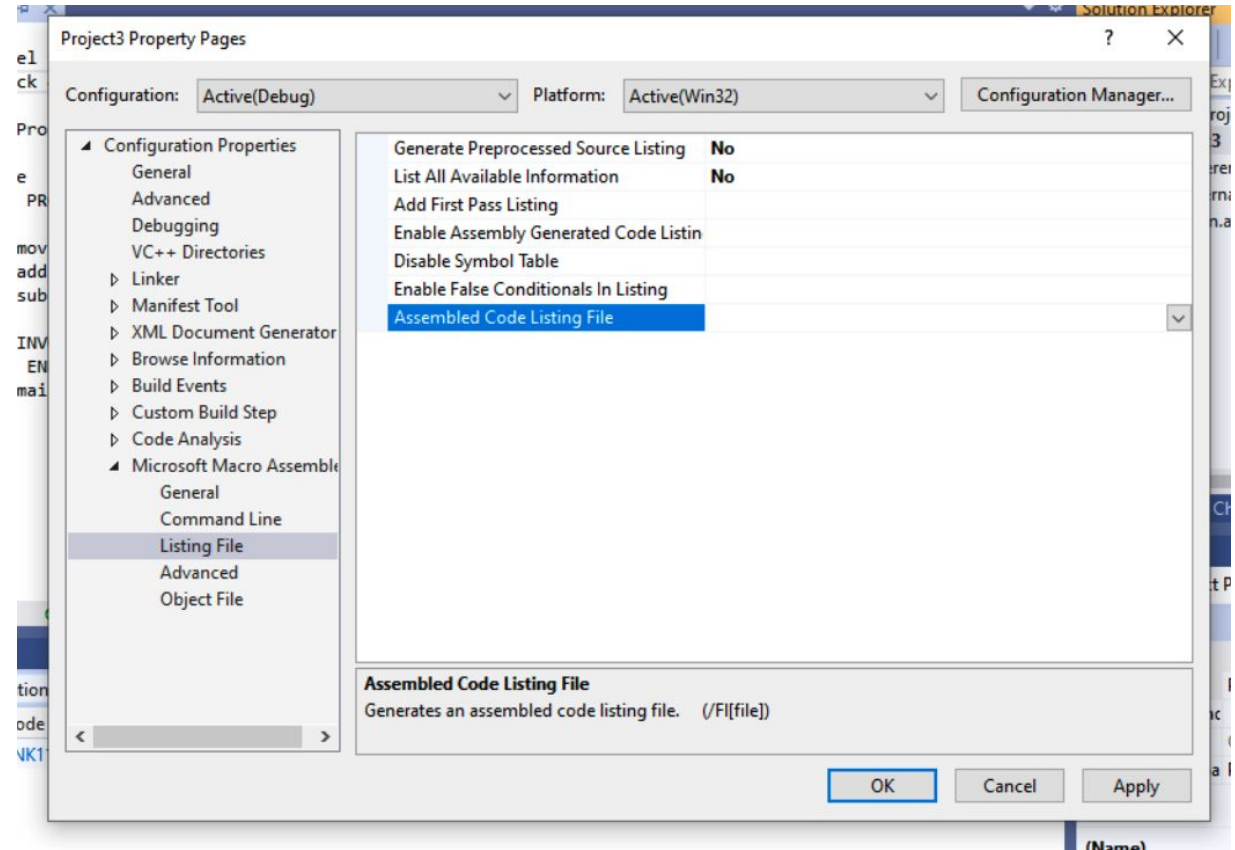
- Go to the Solution explorer
- Right click on the Project name in the solution explorer
- Click properties
- Select Microsoft Macro Assembler
- Then choose Listing File



Error Fix:

1. Delete listing file configuration

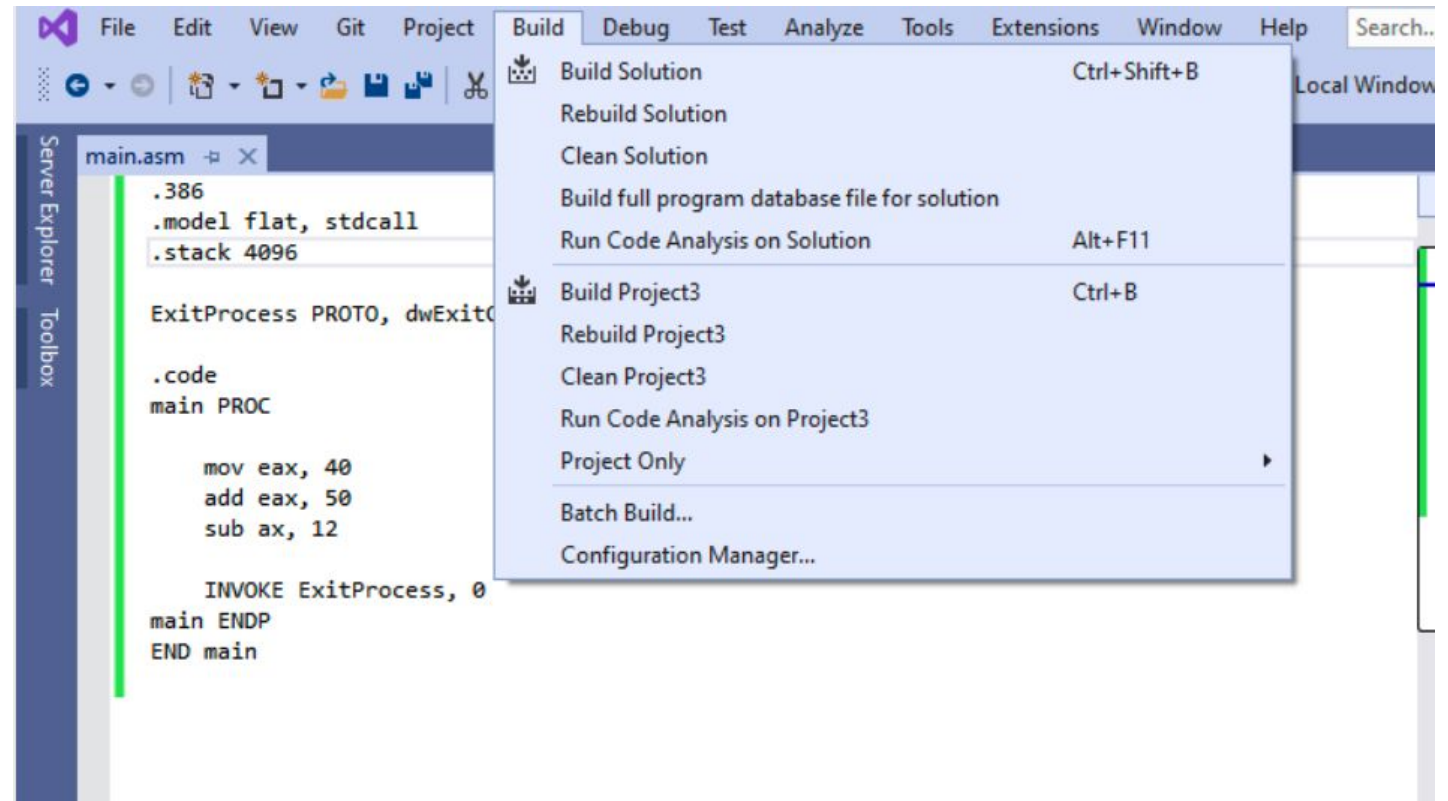
- Set **Generate Preprocessed Source Listing** to **NO**,
- Set **List All Available Information** to **NO**.
- Remove **\$(ProjectName).lst** from Assembled Code Listing File



Error Fix:

2. Clean and Build the project (1)

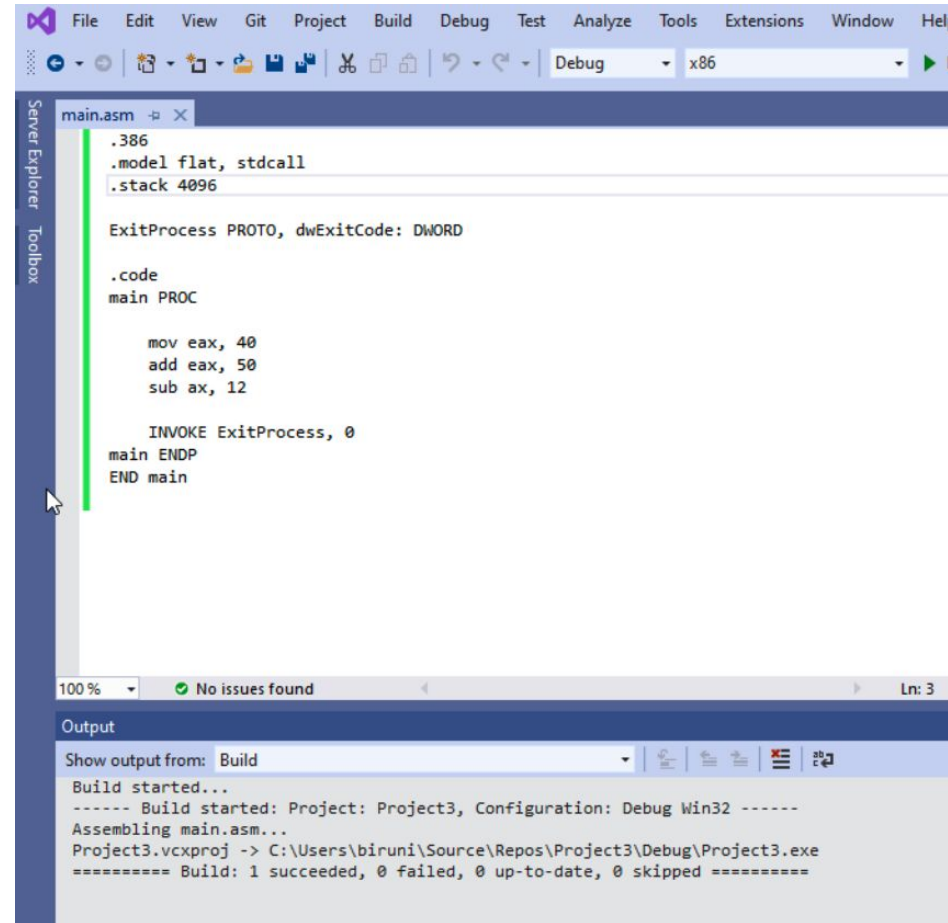
- Clean the project
 - Go to Build -> Clean Project
- Build the project
 - Go to Build -> Build Project



Error Fix:

2. Clean and Build the project (2)

- You should see the message showing that build is successful



The screenshot shows the Visual Studio IDE with the 'main.asm' file open in the editor. The code is assembly language for x86, using the flat model and stdcall convention. It defines a stack size of 4096, declares the ExitProcess prototype, and defines a main procedure that calculates a value (40 + 50 - 12) and calls ExitProcess. The status bar at the bottom indicates 'No issues found'. The Output window at the bottom shows the build process, including the command to run the project and the final success message.

```
main.asm
.386
.model flat, stdcall
.stack 4096

ExitProcess PROTO, dwExitCode: DWORD

.code
main PROC

    mov eax, 40
    add eax, 50
    sub ax, 12

    INVOKE ExitProcess, 0
main ENDP
END main
```

Output

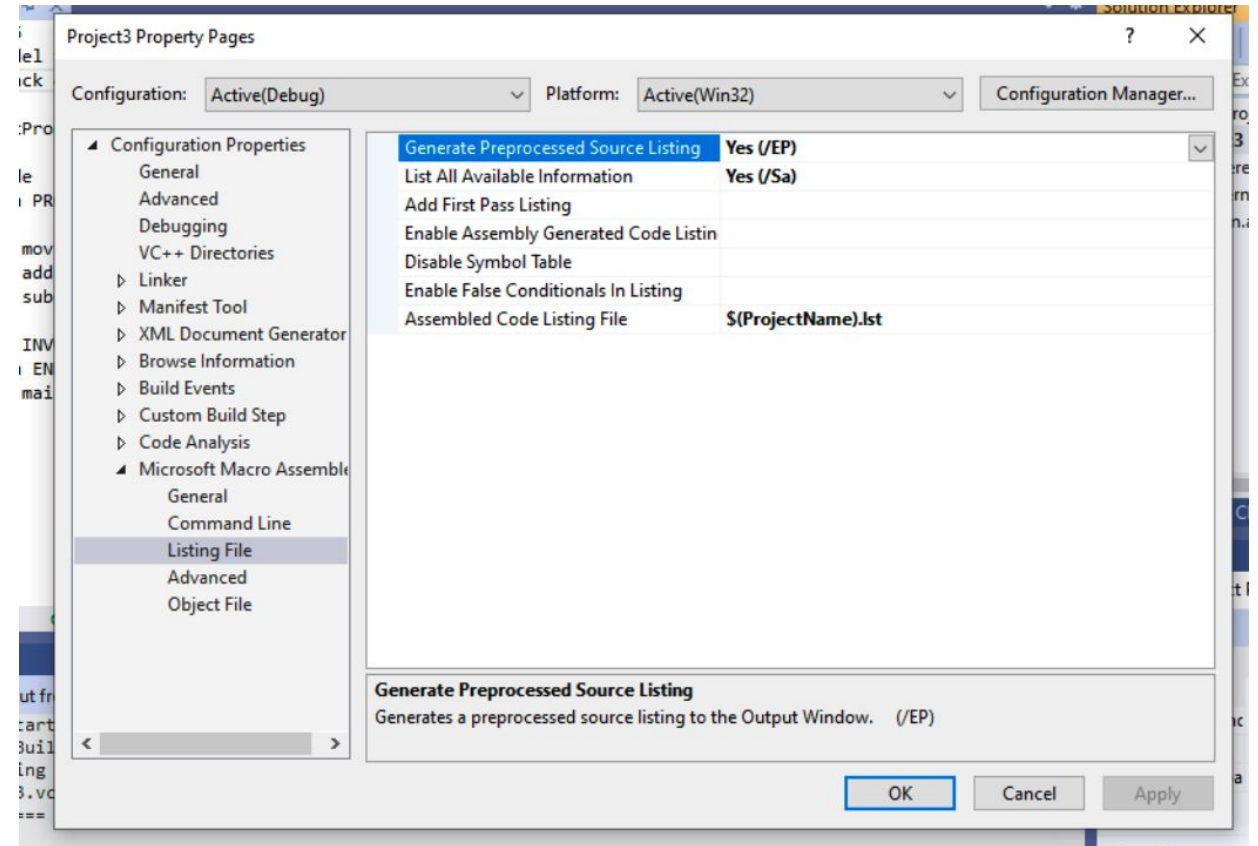
Show output from: Build

Build started...
----- Build started: Project: Project3, Configuration: Debug Win32 -----
Assembling main.asm...
Project3.vcxproj -> C:\Users\biruni\Source\Repos\Project3\Debug\Project3.exe
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====

Error Fix:

2. Re-enter listing file configuration

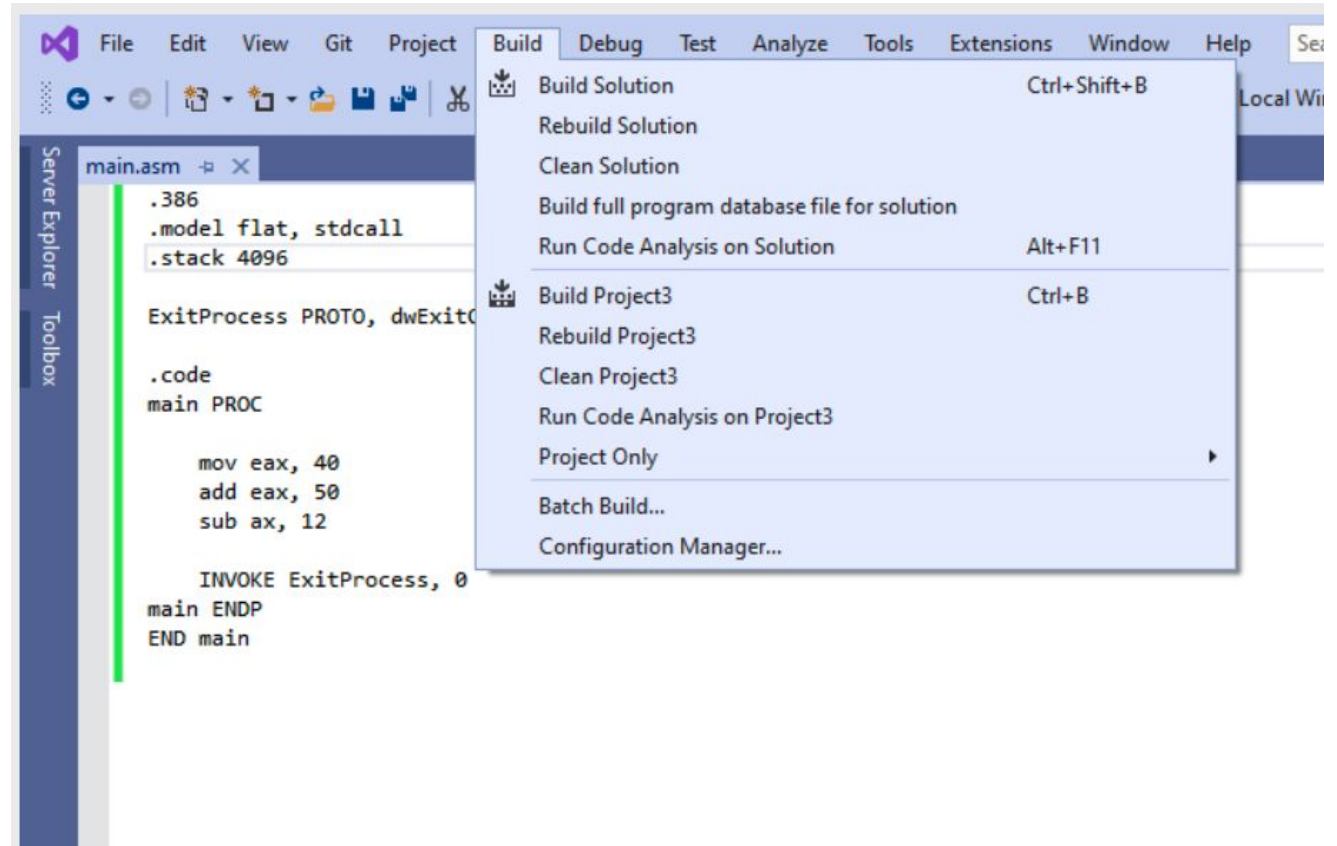
- Select **Properties** from the **Project** menu.
- Under Configuration Properties, select **Microsoft Macro Assembler**.
 - In the dialog window,
 - set **Generate Preprocessed Source Listing** to **Yes**,
 - set **List All Available Information** to **Yes**.
 - Write **\$(ProjectName).lst** in **Assembled Code Listing File**



Error Fix:

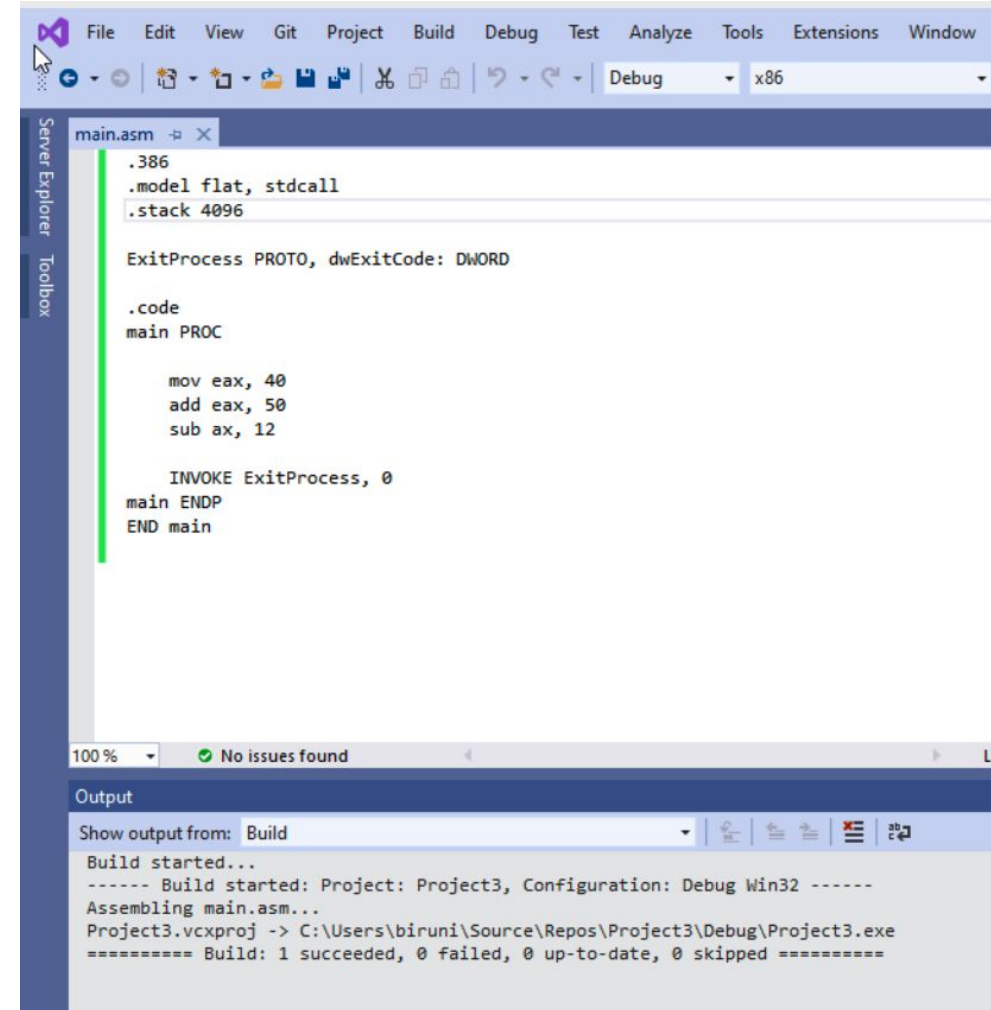
2. Clean and Build the Project **again**

- Go to Build menu
 - Click Clean Project
- Go to Build menu again
 - Click Build Project



The error should go away

- If you still have the error
 - Then don't worry about it
 - This error in the linking phase
 - So assembler already created the listing file for you.
- You can proceed to the next slide.



The screenshot shows the Visual Studio IDE with the assembly file `main.asm` open in the editor. The code is for an x86 assembly program. The `main` procedure calculates a value and calls `ExitProcess`. The build output window at the bottom shows the build process for `Project3` in `Debug Win32` configuration, indicating that the build was successful.

```
.386
.model flat, stdcall
.stack 4096

ExitProcess PROTO, dwExitCode: DWORD

.code
main PROC

    mov eax, 40
    add eax, 50
    sub ax, 12

    INVOKE ExitProcess, 0
main ENDP
END main
```

Output

Show output from: Build

Build started...

----- Build started: Project: Project3, Configuration: Debug Win32 -----

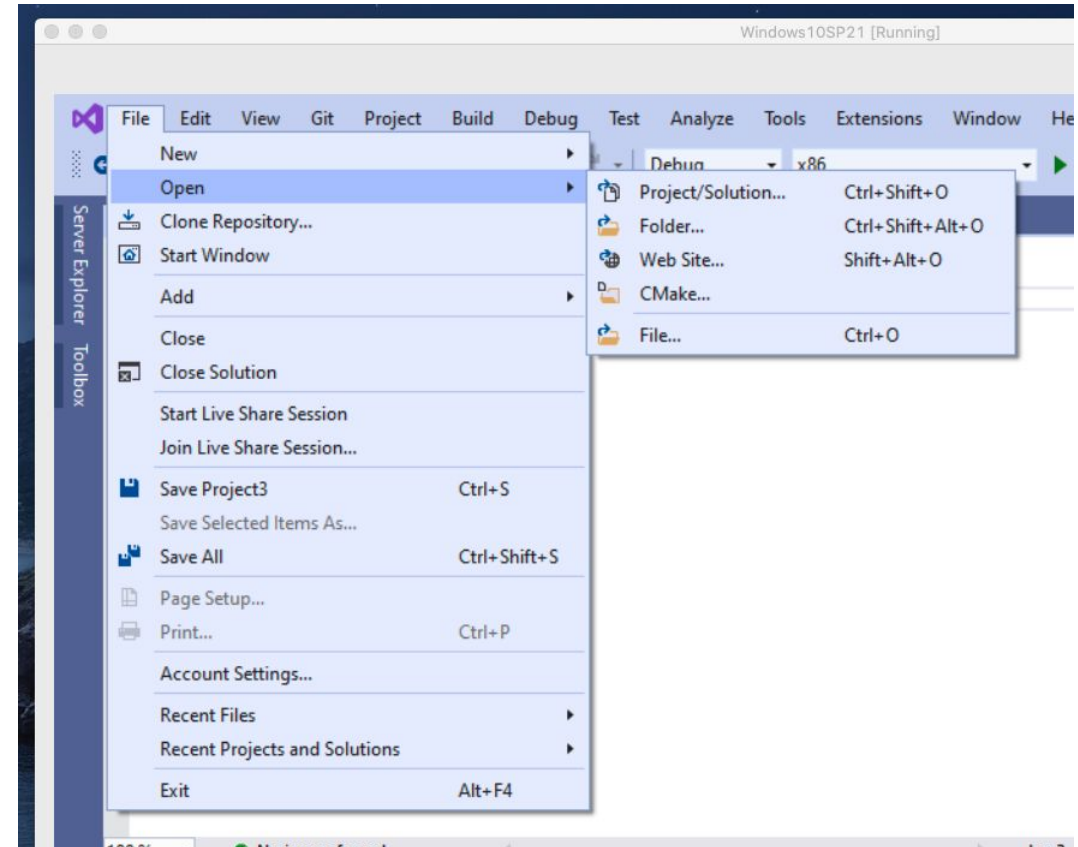
Assembling main.asm...

Project3.vcxproj -> C:\Users\biruni\Source\Repos\Project3\Debug\Project3.exe

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

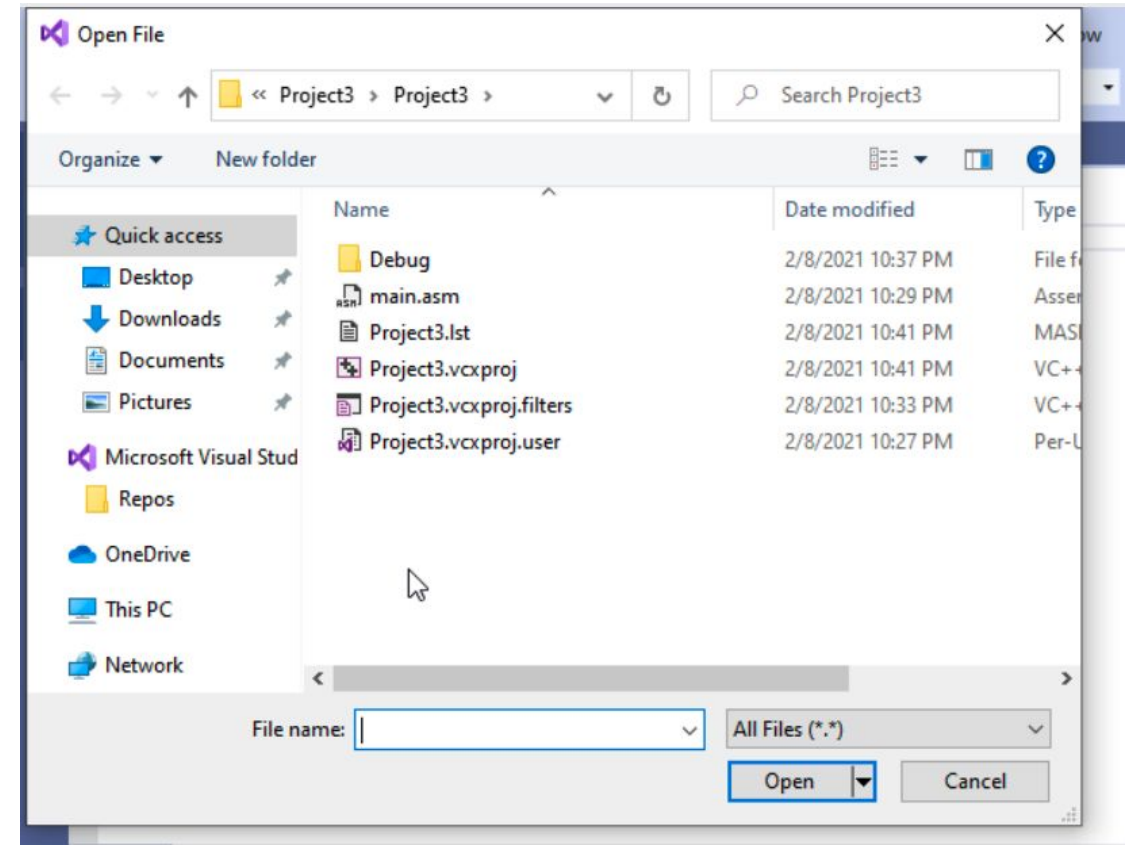
Step 4: Open listing file

- Go to the File Tab
 - Click open
- Then choose file

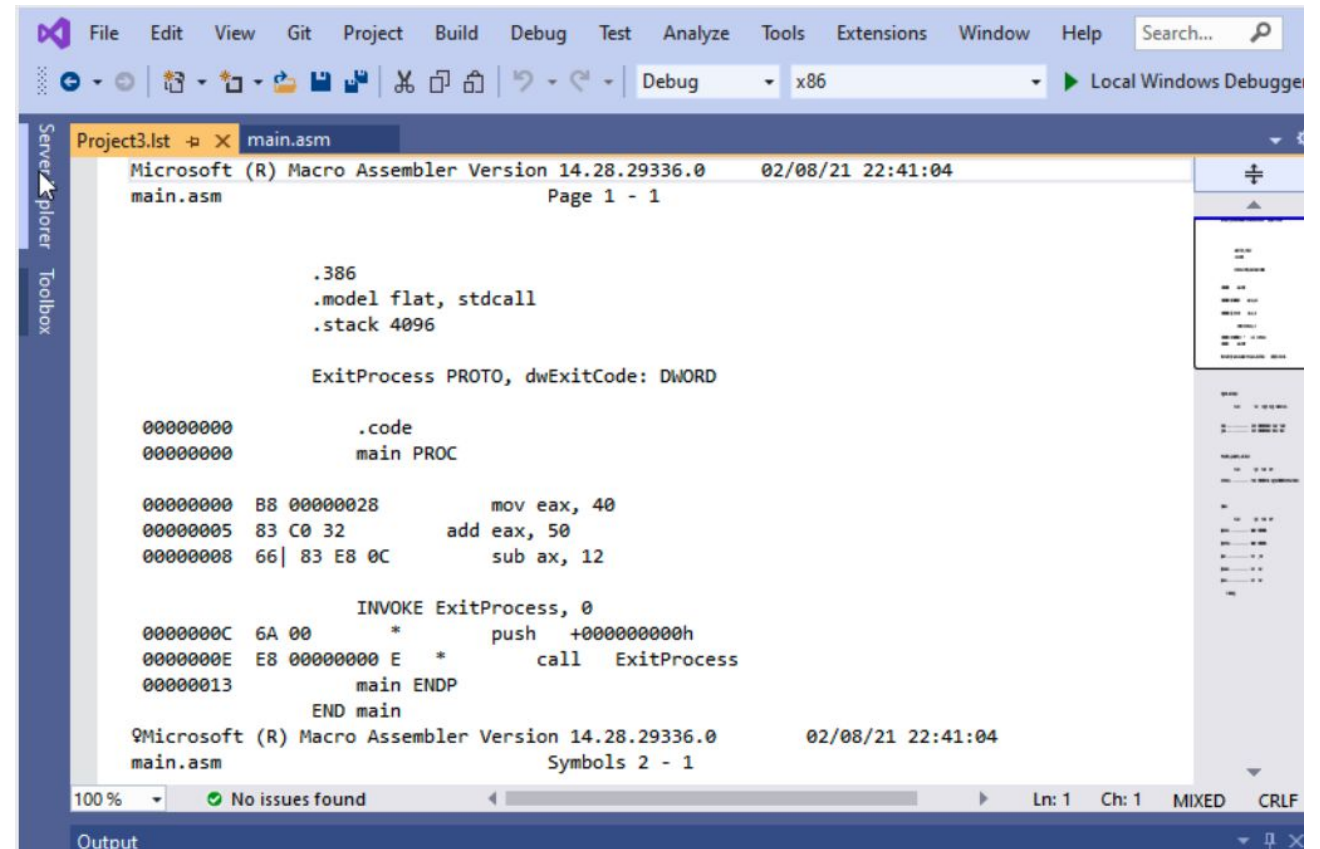


Step 4: Open listing file

- The listing file is created with .lst extension
- Select .lst file
- The listing file have the same name as the project name.



Step 4: Open listing file



The screenshot shows the Visual Studio IDE with the assembly listing file `main.asm` open. The interface includes a menu bar (File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help), a toolbar, and a sidebar with 'Server Explorer' and 'Toolbox'. The main editor displays the assembly code for `main.asm`, which is a 386 assembly program. The code includes directives for the 386 architecture, flat model, and a stack of 4096 bytes. It defines a `main` procedure that initializes `eax` to 40, adds 50 to it, subtracts 12 from `ax`, and then calls `ExitProcess` with a return code of 0. The status bar at the bottom indicates '100 %', 'No issues found', and 'Ln: 1 Ch: 1 MIXED CRLF'.

```
Microsoft (R) Macro Assembler Version 14.28.29336.0    02/08/21 22:41:04
main.asm
Page 1 - 1

        .386
        .model flat, stdcall
        .stack 4096

        ExitProcess PROTO, dwExitCode: DWORD

00000000      .code
00000000      main PROC

00000000  B8 00000028      mov eax, 40
00000005  83 C0 32      add eax, 50
00000008  66 83 E8 0C      sub ax, 12

                INVOKE ExitProcess, 0
0000000C  6A 00      *      push +00000000h
0000000E  E8 00000000 E      *      call ExitProcess
00000013      main ENDP
                END main

Microsoft (R) Macro Assembler Version 14.28.29336.0    02/08/21 22:41:04
main.asm
Symbols 2 - 1
```

Lab 5

Submission Instruction

Problem 1

- Write and run a program with following instructions:
 - mov 20 to AL register
 - mov 100 to AX register
 - mov 1000 to EAX register
 - add 2 to the content of EAX register
 - subtract 20 from al register
- Generate listing file for the program

Submission Instruction

- Generate the listing file.
 - Take a screenshot of the listing file content
 - Submit the screenshot at iCollege.