

Assembly Language Practice 1

(2024.4)

For assembling 32-bit an assembly program, you need to download visual studio and configure it. Your task is to setup the assembly language environment and write a simple assembly code. Please take the following steps.

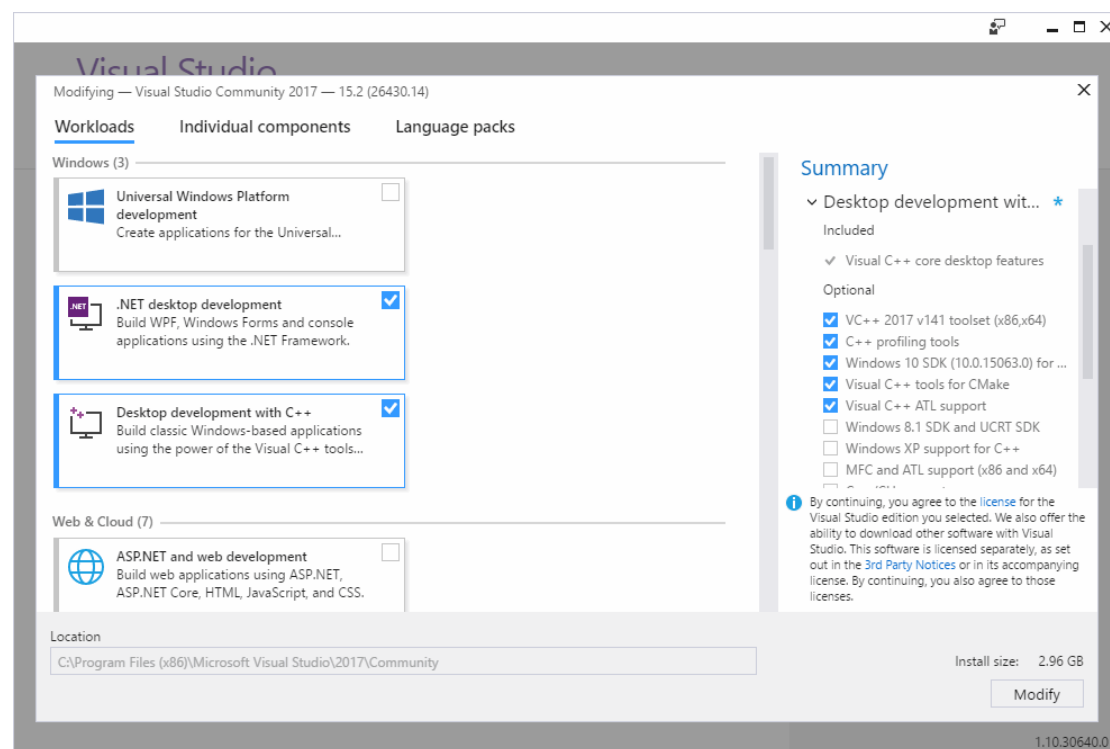
1: Download vs2022 or other edition

(<https://visualstudio.microsoft.com/downloads>, at bottom, select older version)



<https://my.visualstudio.com/Downloads/Featured?mkt=zh-cn>

After you have downloaded and installed the VS 2022 Community Edition, you may need to install the Visual C++ language and .Net development. If you run the VS installer, select the *Desktop development with C++* button in the installer window, look at the summary list on the right side to verify that VC++ is selected, and click the modify button in the lower right corner of the window.

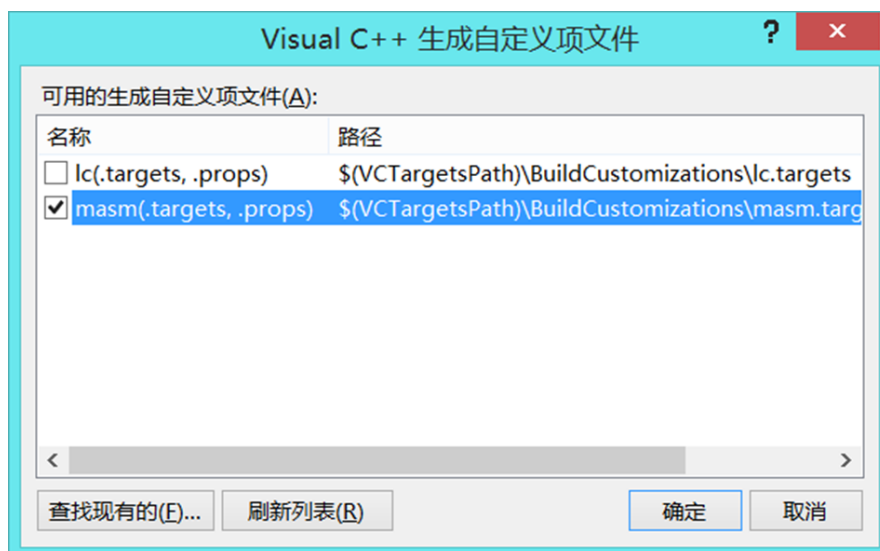


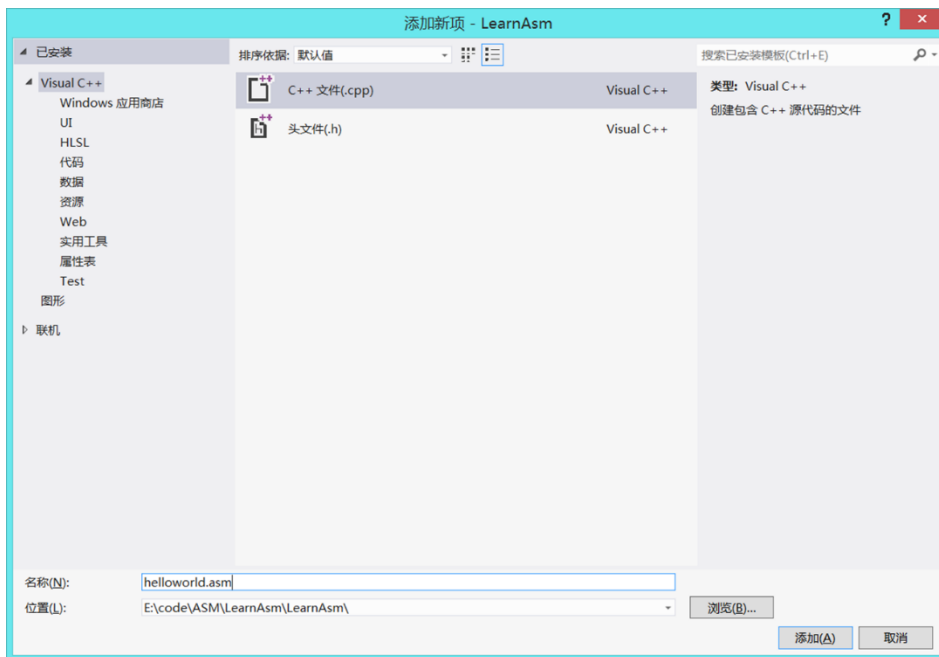
2. Setup Visual studio

Create a new empty project

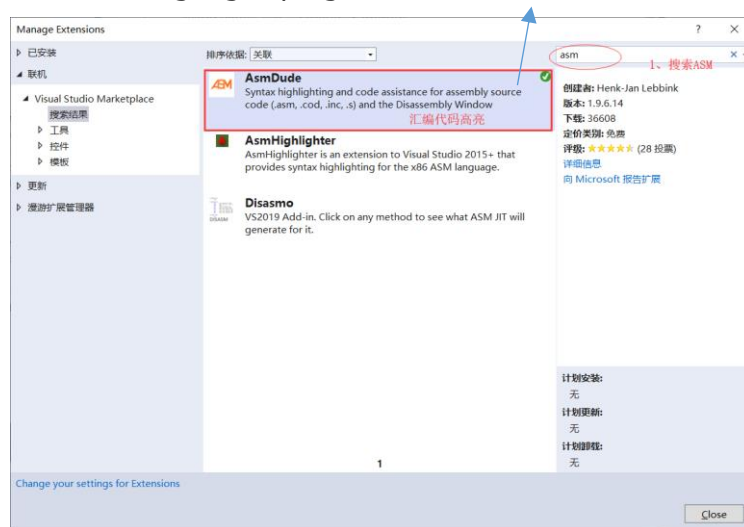
Right-click project name to select "create dependent" option and select "masm" option.

Create a new file and select C++ with extension ".asm",



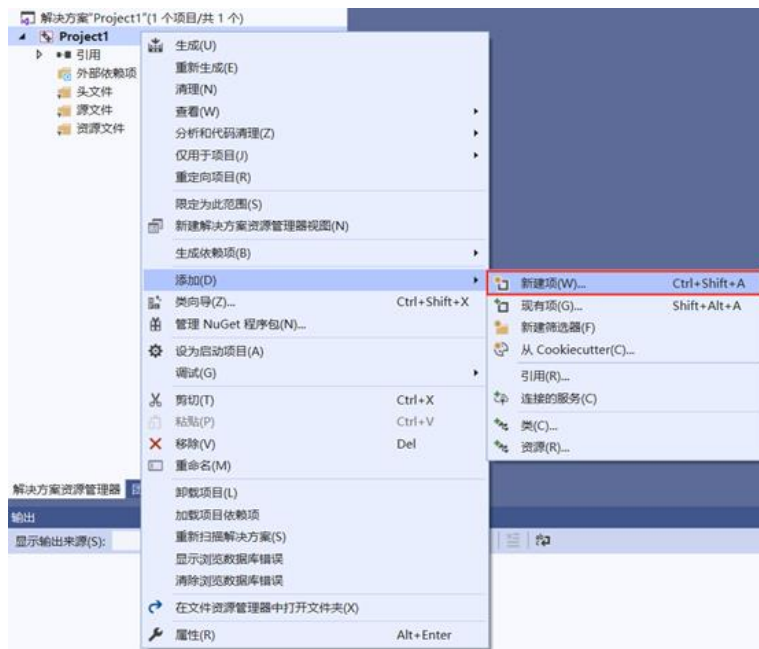


Click tool, Select “expansion and update” option from the tools menu, select “online” option and input “asmdude” in textfield box on the right side and search and install highlight plug-in.



3. Edit, build and run your program

Right-click project name to select “add” option, select “new item”. Input your code in coding workspace.

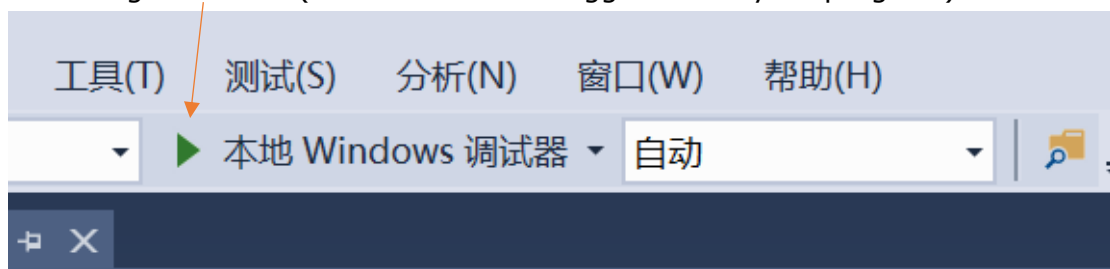


Build the Program

Now you will build (assemble and link) the sample program. Select **Build Project** from the Build menu. In the Output window for Visual Studio at the bottom of the screen, you should see messages similar to the following, indicating the build

Run your program

Click green arrow(local windows debugger to run your program)



Run the Program in Debug Mode

The easiest way to run your first program is to use the debugger. First, you must set a breakpoint. When you set a breakpoint in a program, you can use the debugger to execute the program a full speed (more or less) until it reaches the breakpoint. At that point, the debugger drops into single-step mode. Here's how to do it:

1. select *Start Debugging* from the Debug menu. The program should run and pause on the line with the breakpoint.

2. Press the F10 key (called *Step Over*) or F11 to execute the current statement.
Continue pressing F10 until the program is over.
3. Press F10 one more time to end the program.

4: Write assembly program as following template

The template is as follows

```
.386
.model flat,stdcall
.stack 4096
ExitProcess PROTO, _dwExitCode: DWORD
.data
; declare variables here
.code
main PROC
; write your code here
INVOKE ExitProcess,0
main ENDP
END main
```

1)Write asm program to adds two 32-bit integers and observe the result register and memory in debug mode.

2)Define 3 hexadecimal variables and initialized, Get the sum of first two variables and subtract 3rd variable from sum.

Click debug, select the window, select the register and memory

Select memory, input &sum to view the result

3) Calculate $2^{29}+40$ observe the result

4) From the textbook(P92)

Data Definitions

Write a program that contains a definition of each data type listed in Table 3-2 in Section 3.4.

Initialize each variable to a value that is consistent with its data type.

Symbolic Integer Constants

Write a program that defines symbolic constants for all of the days of the week. Create an array variable that uses the symbols as initializers.

Symbolic Text Constants

Write a program that defines symbolic names for several string literals (characters between quotes). Use each symbolic name in a variable definition.