資料來源：高等數位影像處理ADIP，郭天穎老師

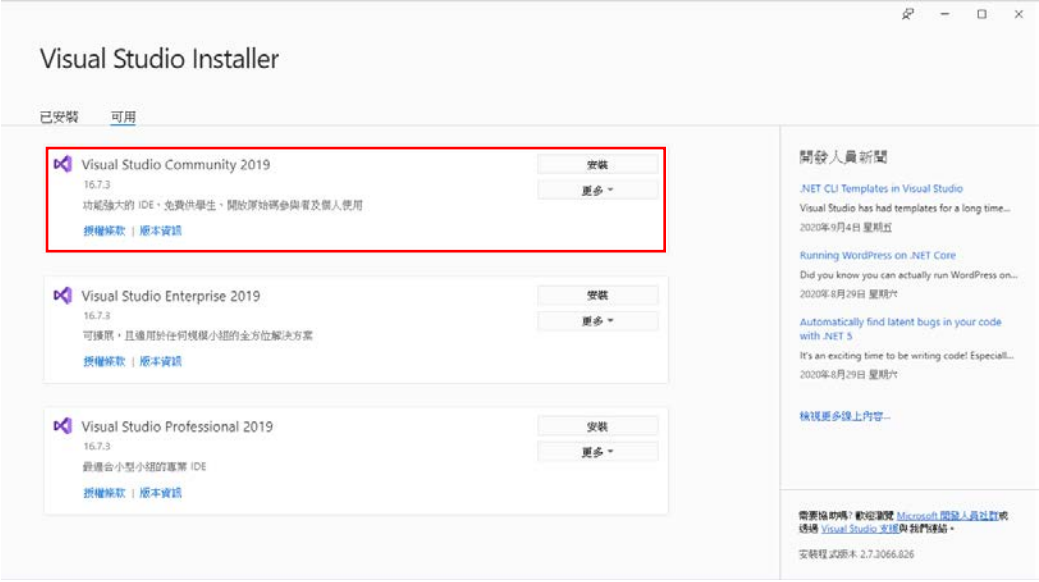
ADIP OpenCV Setup Guide，Last edit date：2021/09/23

You need to prepare the software as below：

VS2019_RTM_ULT_CHT[https://www.visualstudio.com/vs/older-downloads/]
OpenCV-4.4.0.exe [https://opencv.org/opencv-4-4-0/]

Installing VC2019(You can use other version)：

Choose the Community 2019
Click on the vs2019 file and run the setup.

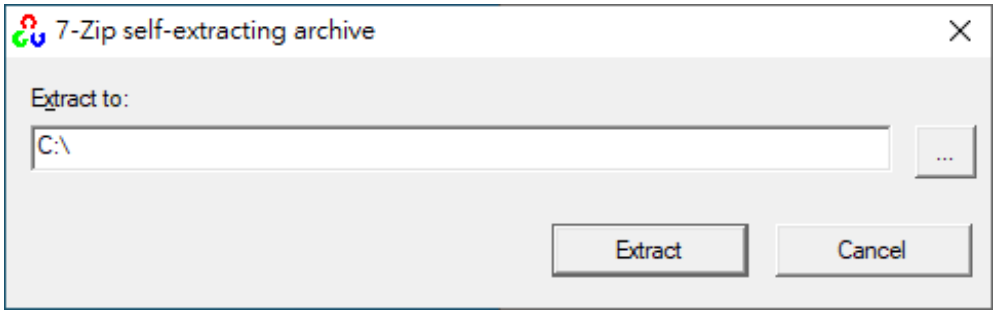


Install tool：

Installing OpenCV (version 4.4.0 as example)：

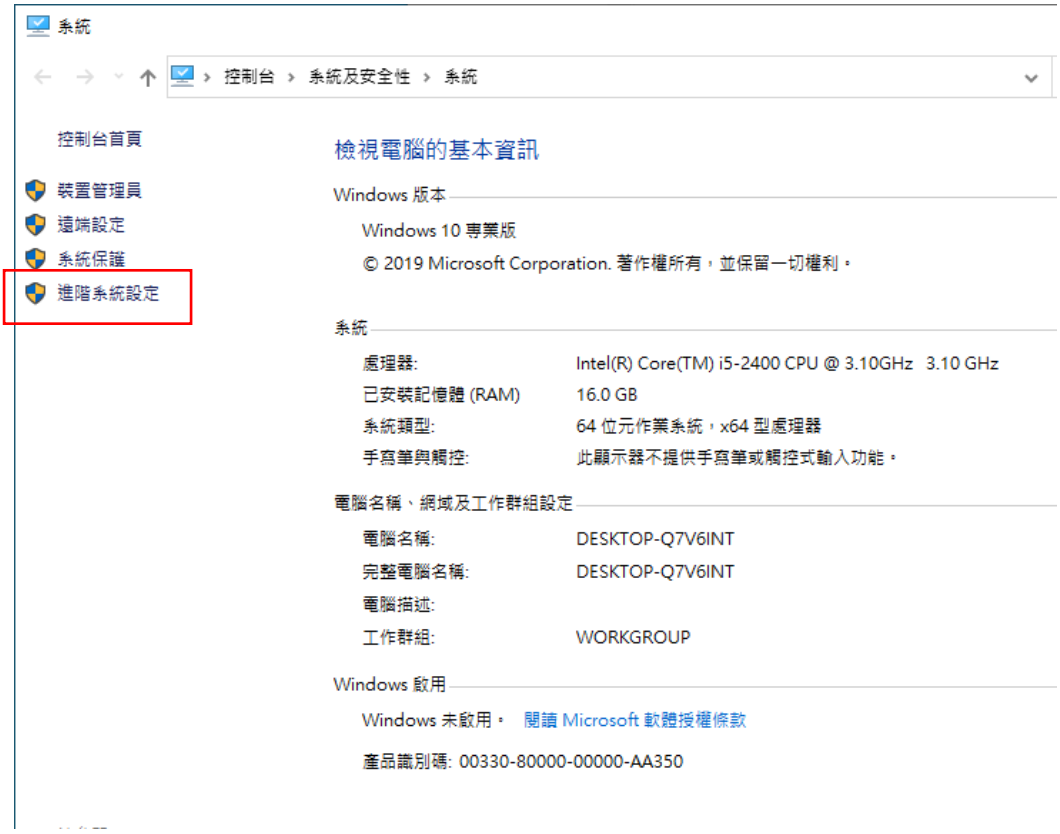
Double click OpenCV-4.4.0.exe to start the installation.

And set it in a directory (C:\)

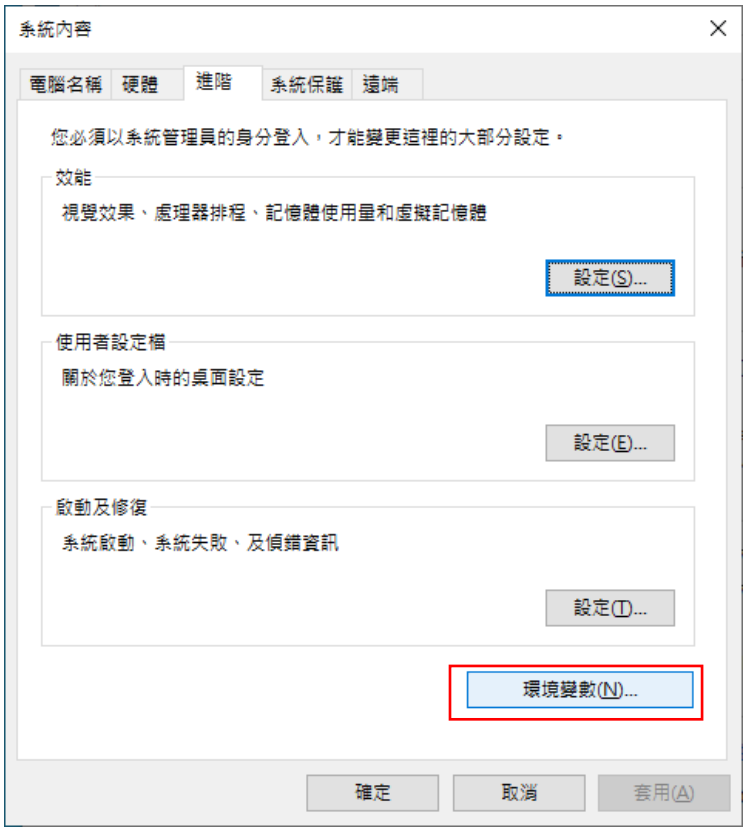


To add the path of OpenCV into system path.

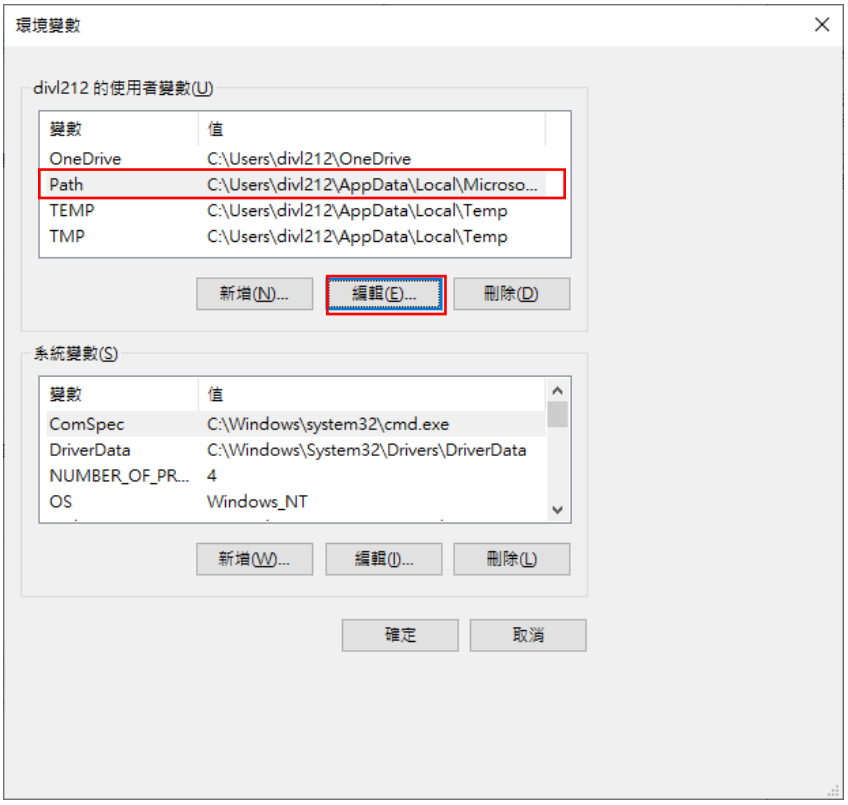
Click on “進階系統設定”



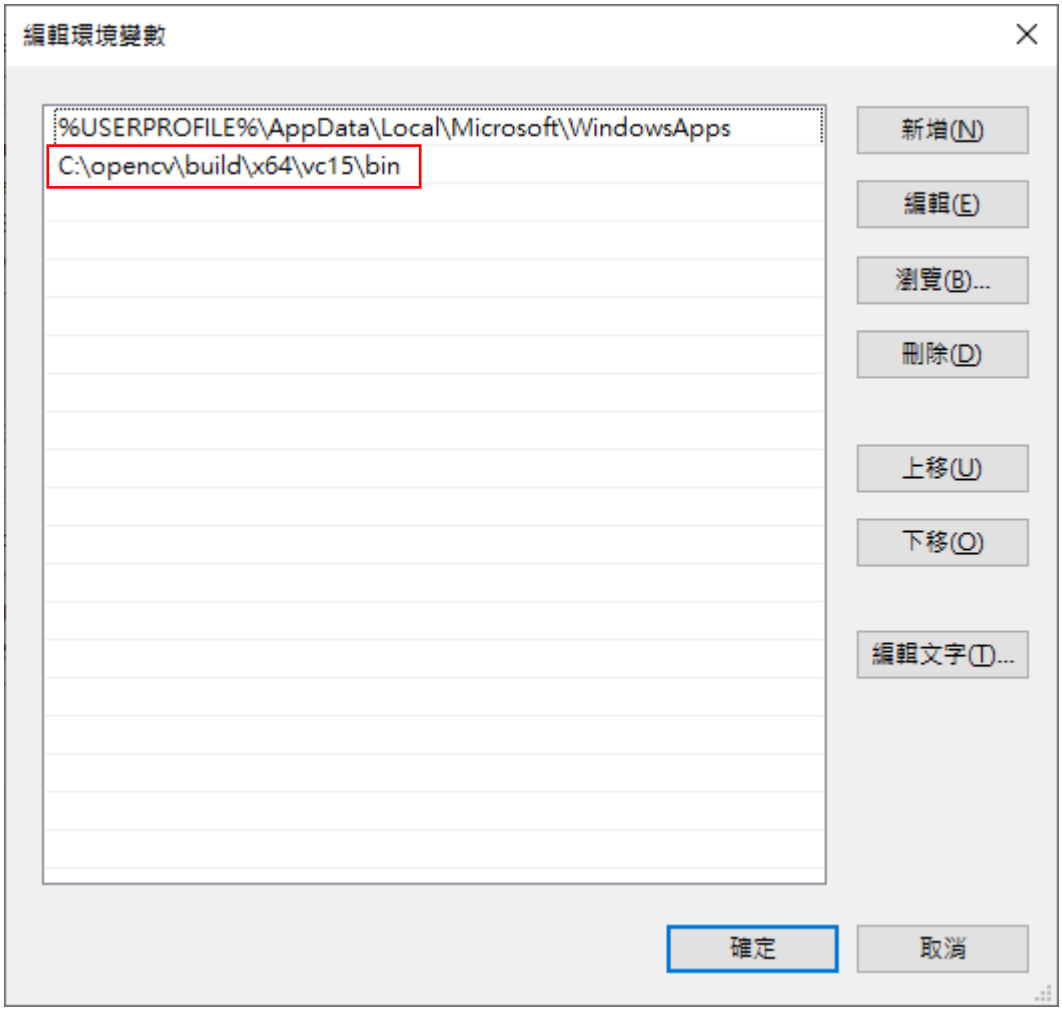
Click on “環境變數”



Click on “Path” & 編輯



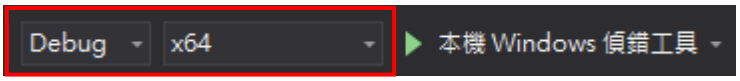
Add bin path as below



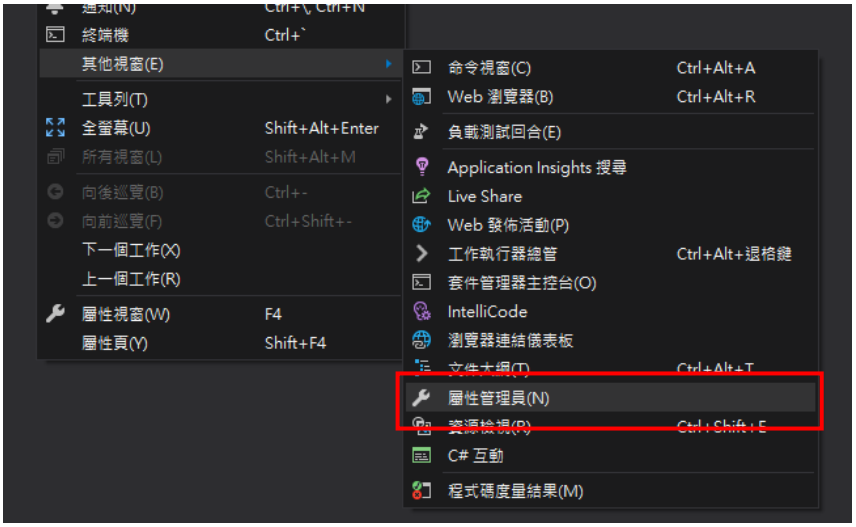
Save setting and restart your computer

Build a empty project(C++)

Check your In Debug Mode and the list select x64.

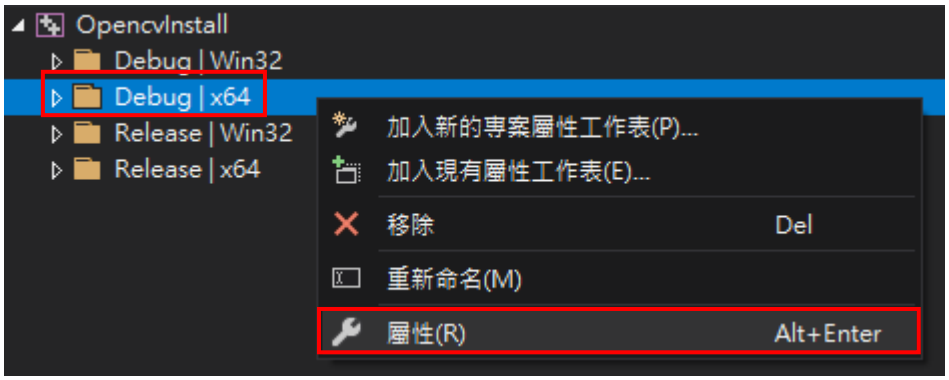


Move to the project and click on the right button.
Open “檢視 > 其他視窗 > 屬性管理員”

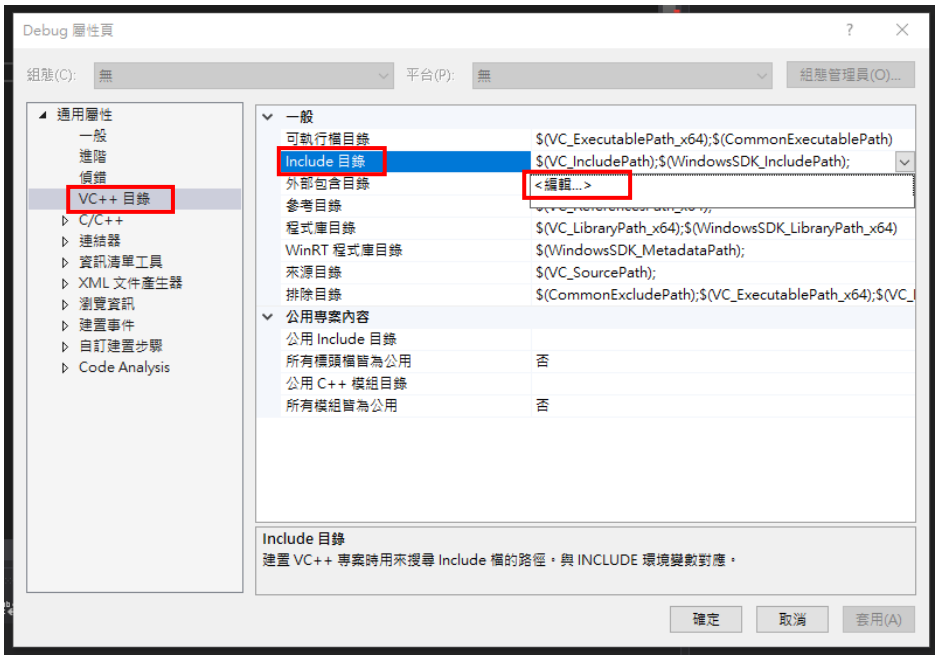


In Debug mode：

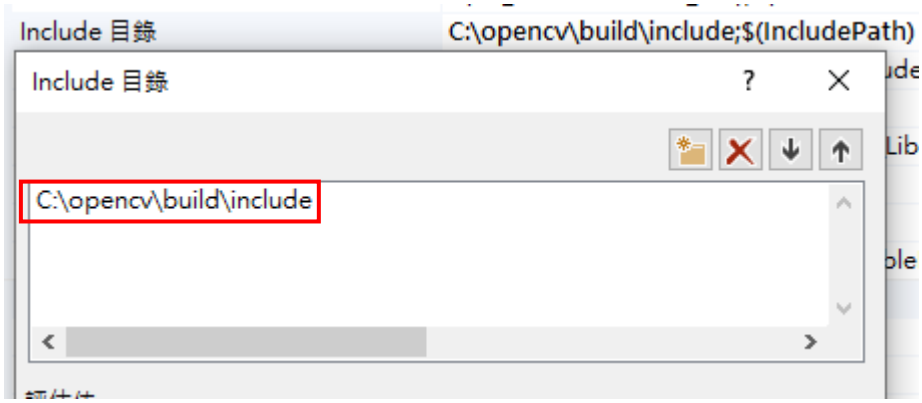
Right click on “Debug | x64”，Click “屬性”



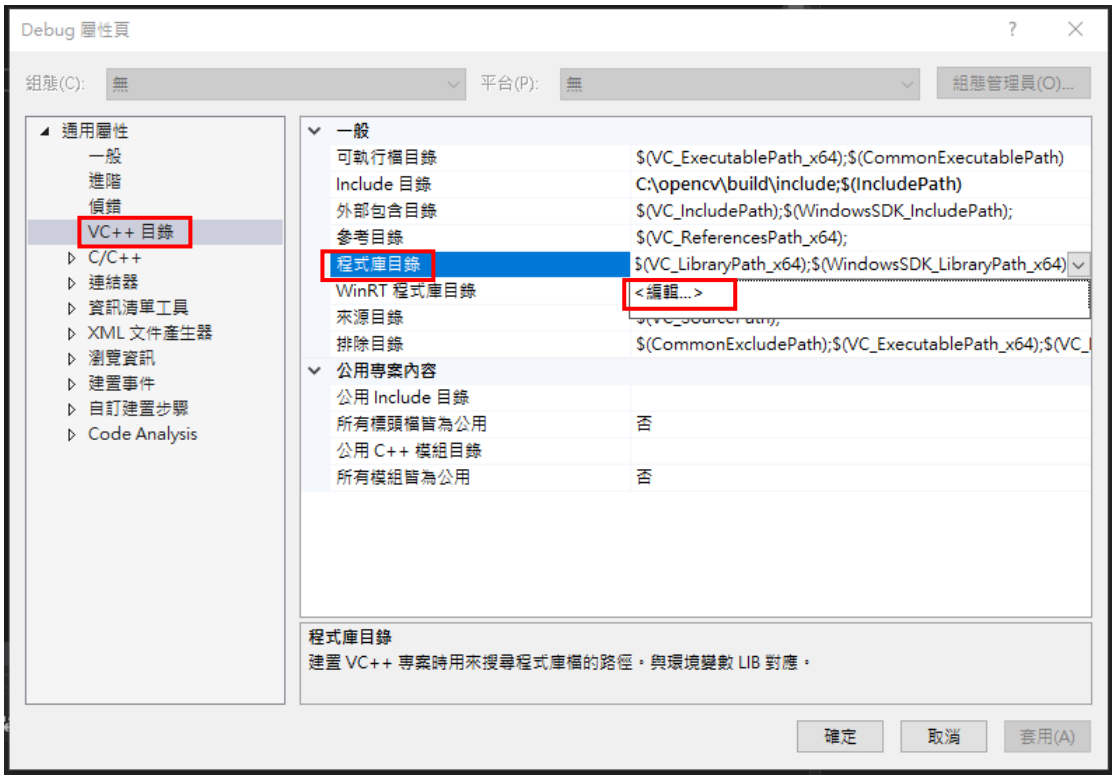
Select VC++ directories



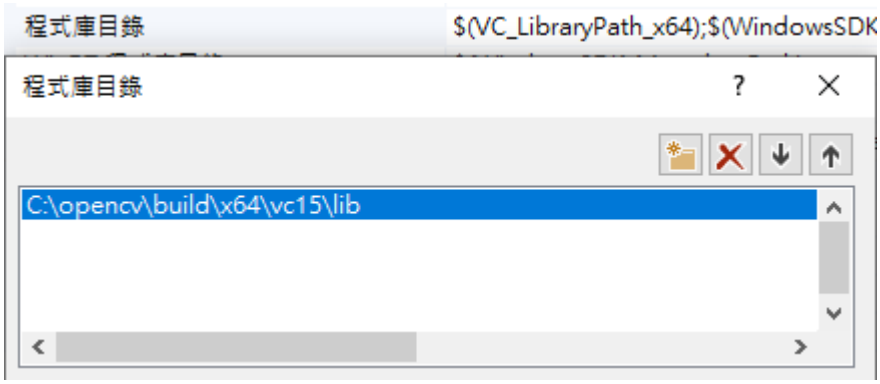
select Include Directories，edit->add path：" C:\opencv\build\include"



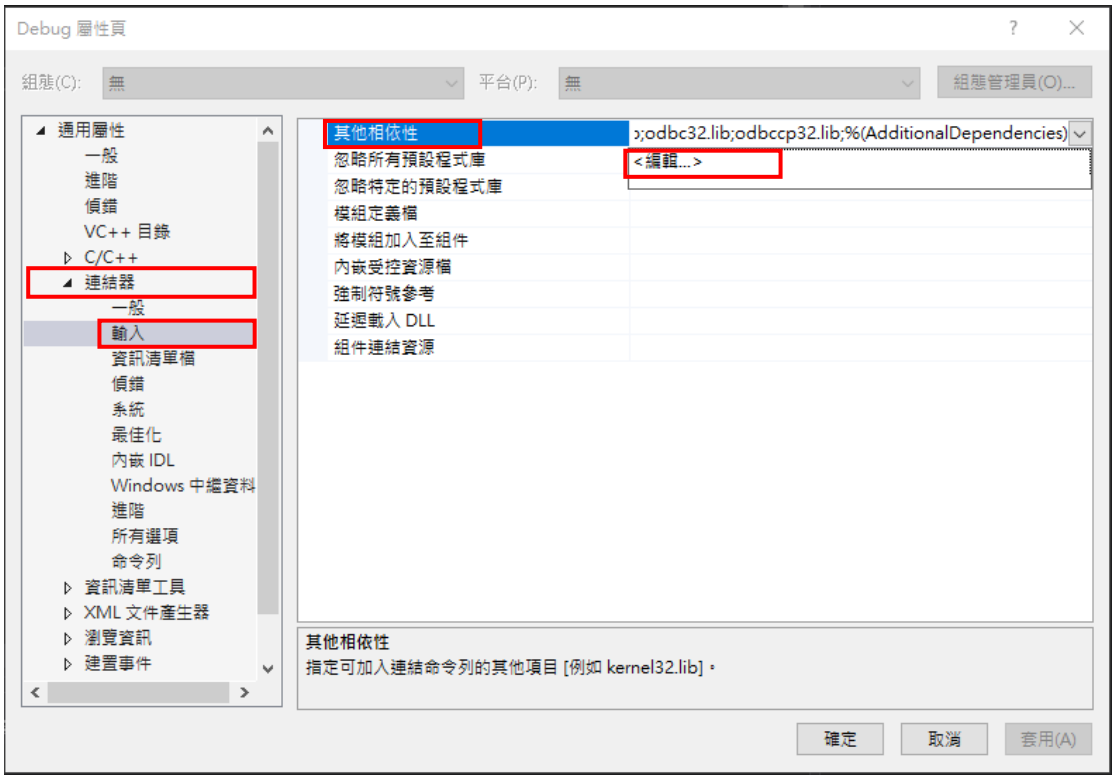
Select VC++ directories



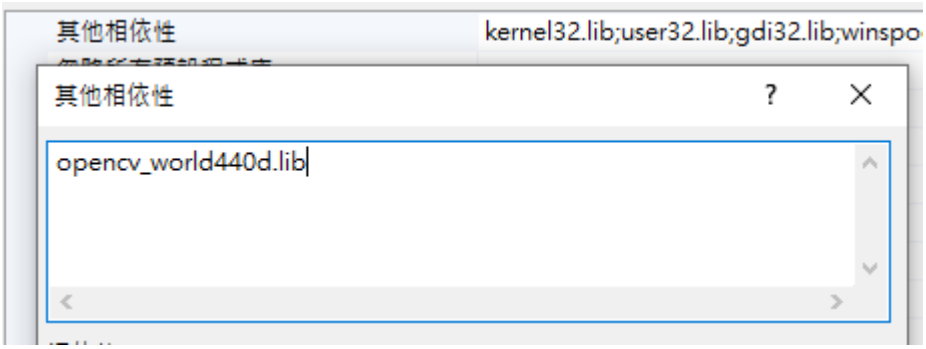
Library Directories，edit->add path：“C:\opencv\build\x64\vc15\lib”



Then choose Linker->Input->Additional Dependencies->edit



Add following library file names：opencv_world440d.lib

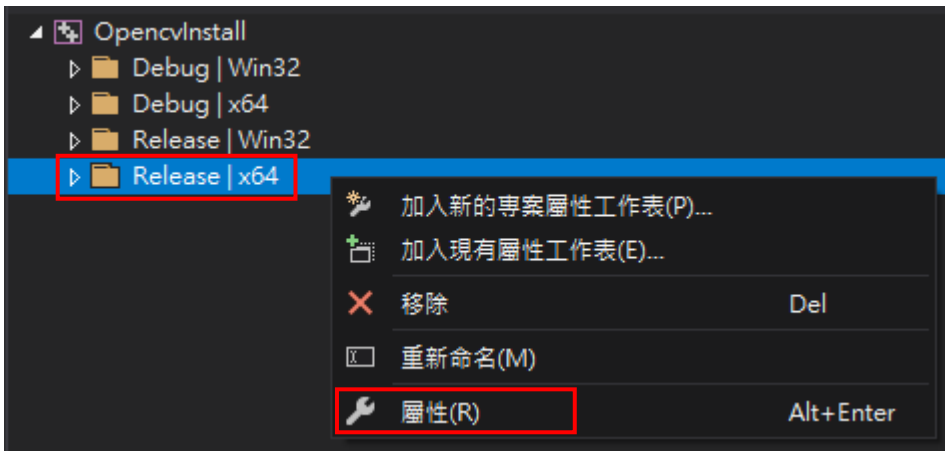


(Note：in “opencv_world440d.lib”，”d” means debug，one without “d” is for release mode)

Debug mode setup finished

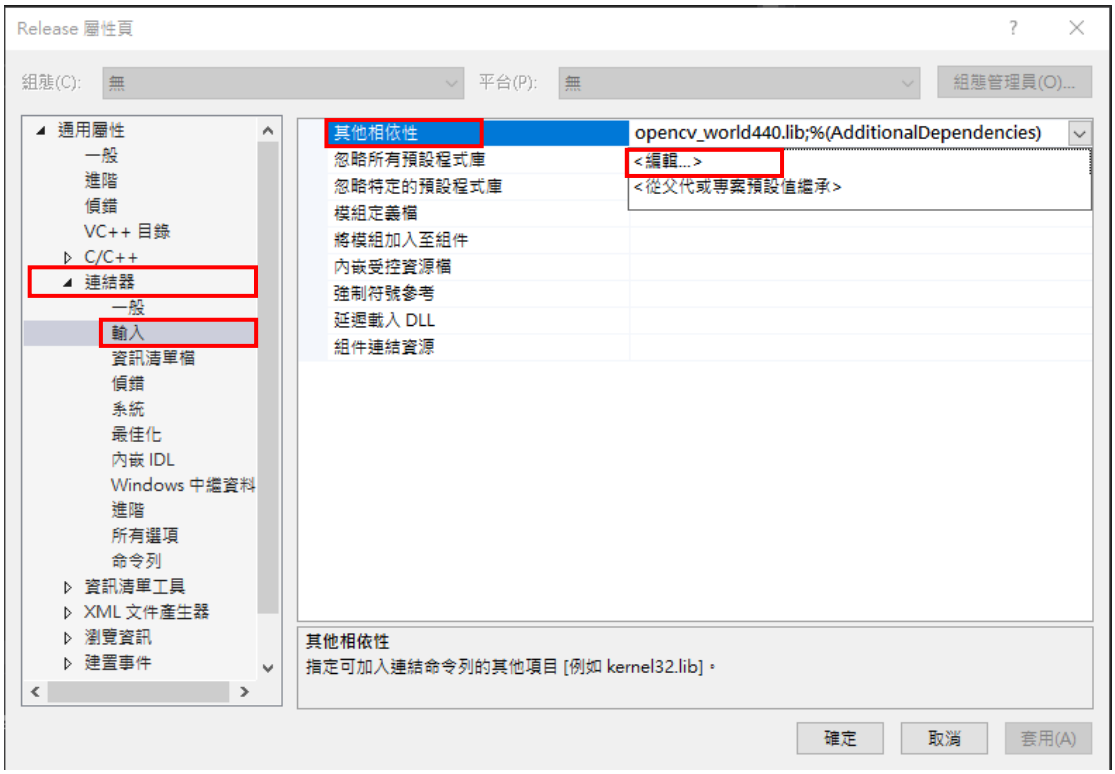
In Release mode：

Right click on “Release | x64”，Click “屬性”

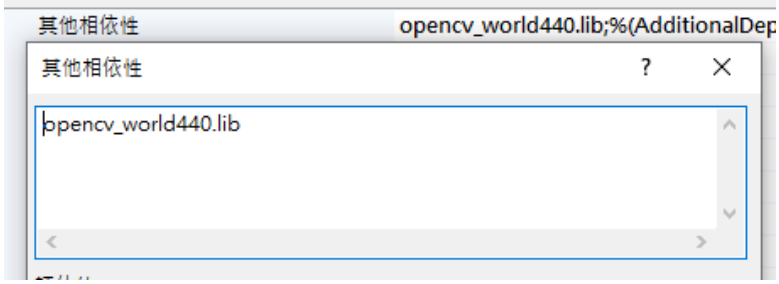


Setting up Release mode is same as Debug，only difference is the final step.

opencv_world440d.lib → opencv_world440.lib



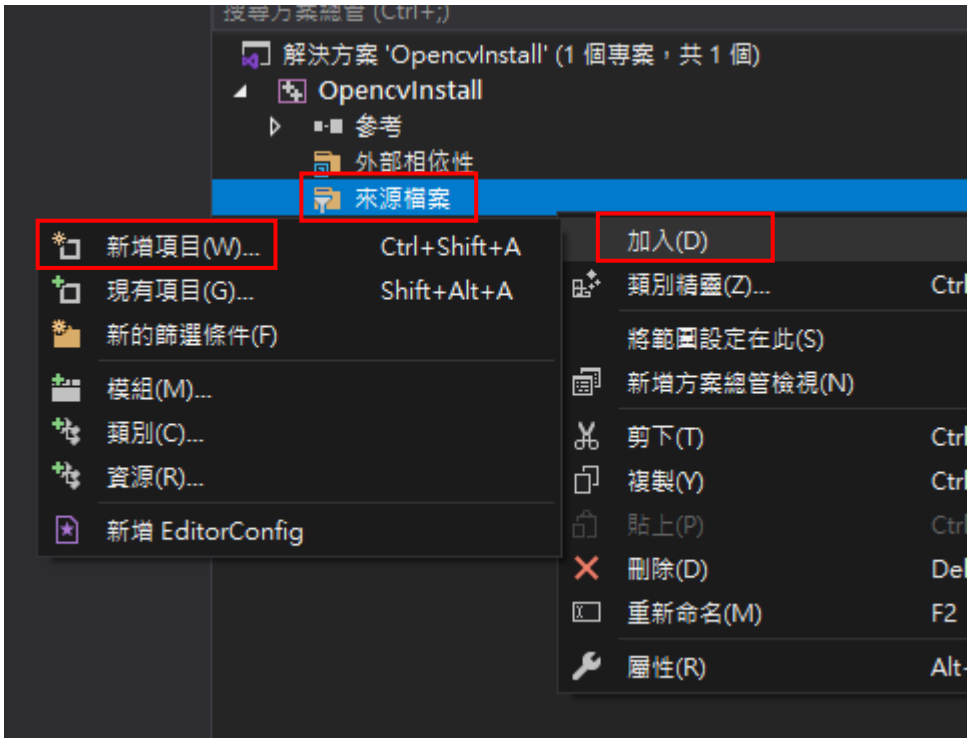
Add following library file names：opencv_world440.lib



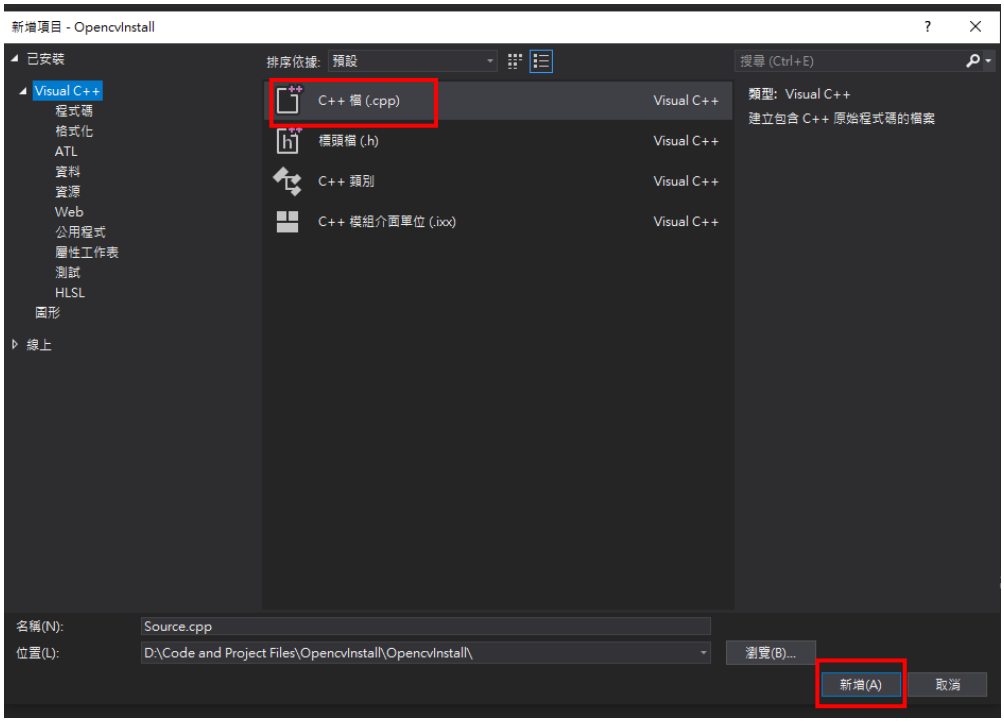
Testing OpenCV

Add test code

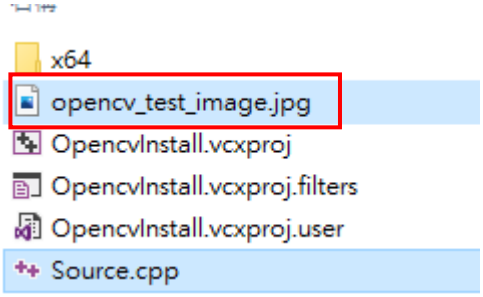
Right click ”來源檔案”，select ”加入”，click ”新增項目”



Select “.cpp”

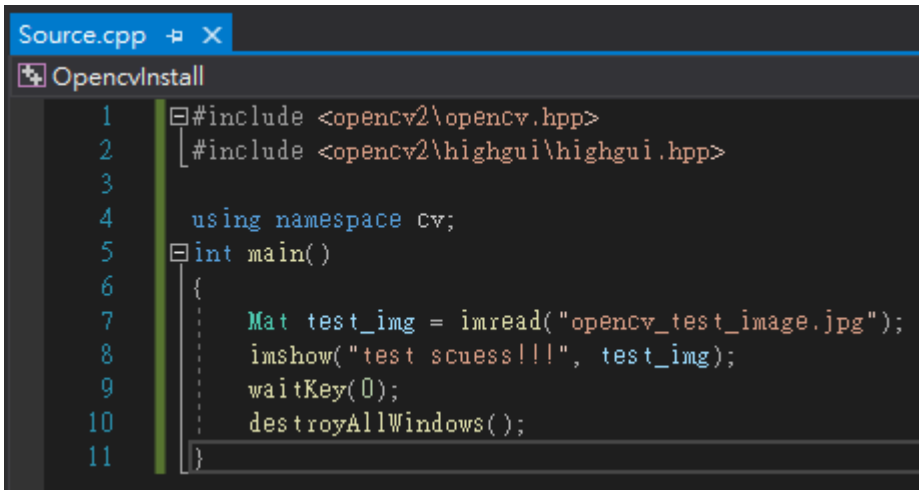


Put test image in same location of Source.cpp



Copy and paste testing code below：

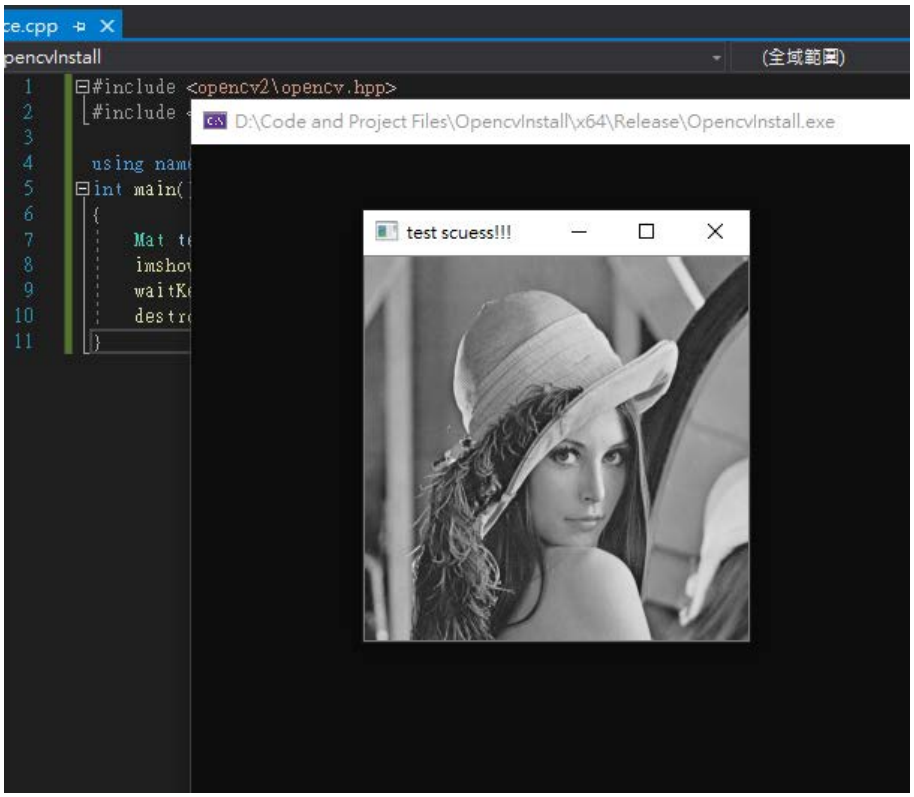
```
#include <opencv2\opencv.hpp>
#include <opencv2\highgui\highgui.hpp>

using namespace cv;
int main()
{
	Mat test_img = imread("opencv_test_image.jpg");
	imshow("test scuess!!!", test_img);
	waitKey(0);
	destroyAllWindows();
}
```



Compile and run the code

Correct result：

Remember to test on both Debug and Release



Enjoy your OpenCV！

- Opencv 檔案讀取

```
#include <opencv2\opencv.hpp>
using namespace cv;

int main()
{
    Mat lena;
    lena = imread("lena.jpg");
    imshow("lena", lena);
    waitKey(0);
    return 0;
}
```

- 灰階影像轉換

```
cvtColor(lena, gray_lena, COLOR_BGR2GRAY);
```

- 函式應用

GaussianBlur

Canny

- 影像

A[0][0]	A[0][1]	A[0][2]	A[0][3]
A[1][0]	A[1][1]	A[1][2]	A[1][3]
A[3][0]	A[2][1]	A[2][2]	A[2][3]

65	88	51	97
98	72	67	45
45	79	12	32

```
printf("lena(0, 0)[0] = %d\n", lena.at<Vec3b>(0, 0)[0]);
printf("lena(0, 0)[1] = %d\n", lena.at<Vec3b>(0, 0)[1]);
printf("lena(0, 0)[2] = %d\n", lena.at<Vec3b>(0, 0)[2]);
printf("lena(0, 0) = %d\n", gray_lena.at<uchar>(0, 0));
```

```
lena(0, 0)[0] = 125
lena(0, 0)[1] = 137
lena(0, 0)[2] = 225
lena(0, 0) = 162
```