



香港中文大學

The Chinese University of Hong Kong

*CSCI2510 Computer Organization*

# **Tutorial 01: ENVIRONMENT SETUP FOR MASM**

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# Tips for Mac OSX



- To make sure your program can be executed on our machine (as well as keep consistency), we strongly recommend you use Windows + Visual Studio (community) as your develop platform.
- The Visual Studio community edition for Mac OS doesn't support assembly language.
- If you are using Mac, we recommend you to install Windows on you machine and then follow the guidelines in today's slides.

# Tips for Mac OSX



- Download Windows (10/8) ISO from:  
<https://www.microsoft.com/en-hk/software-download/windows10>
  
- (1) Use Boot Camp to install windows on your Mac:
  - <https://support.apple.com/en-hk/boot-camp>
  - Guideline:
    - <https://support.apple.com/en-hk/HT201468>
  
- (2) Use Virtual Box (free) or Parallel (30 days for free) to build Windows virtual machine on your Mac:
  - <https://www.virtualbox.org/>
  - <https://www.parallels.com/hk/>
  - <https://medium.com/oceanize-geeks/install-windows-10-7-on-mac-using-virtualbox-109be82b6037>

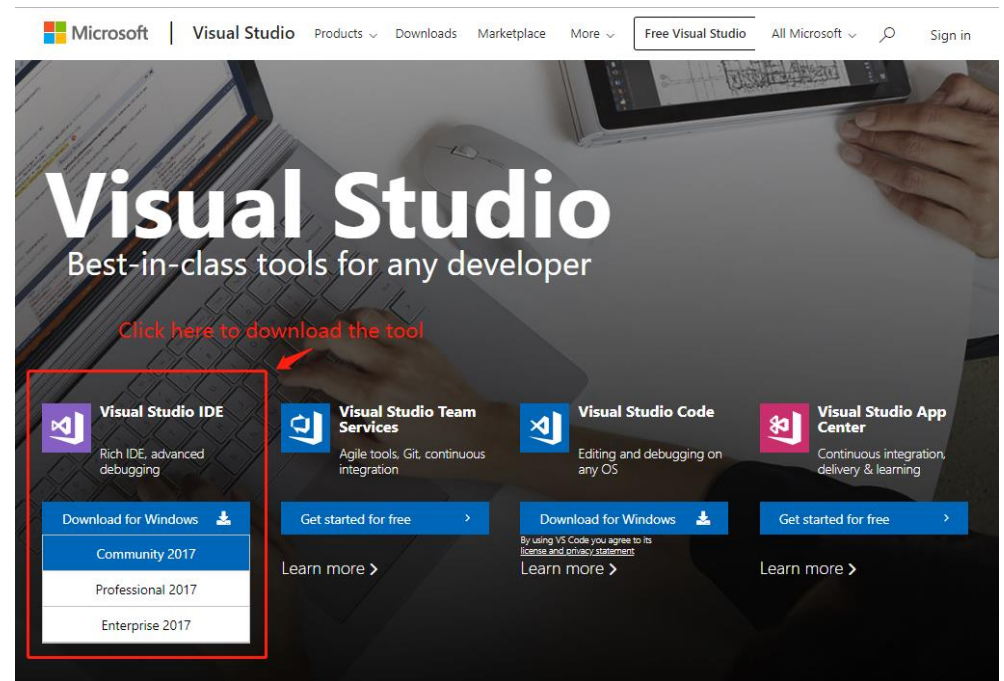
# Development Environment



- Integrated Development Environment (IDE):
  - Microsoft Visual Studio 2017/ 2015

- Community Edition:
  - Full featured
  - Free

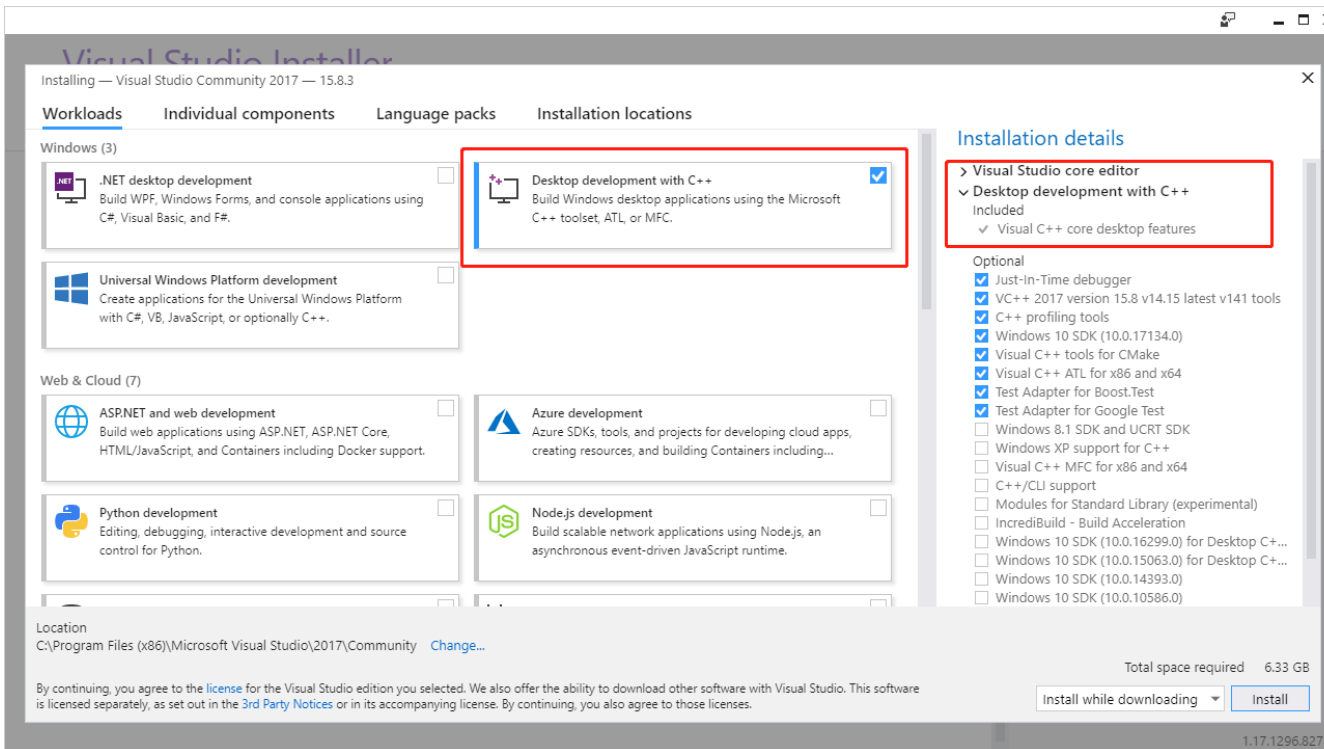
- [www.visualstudio.com](http://www.visualstudio.com)



# Installation



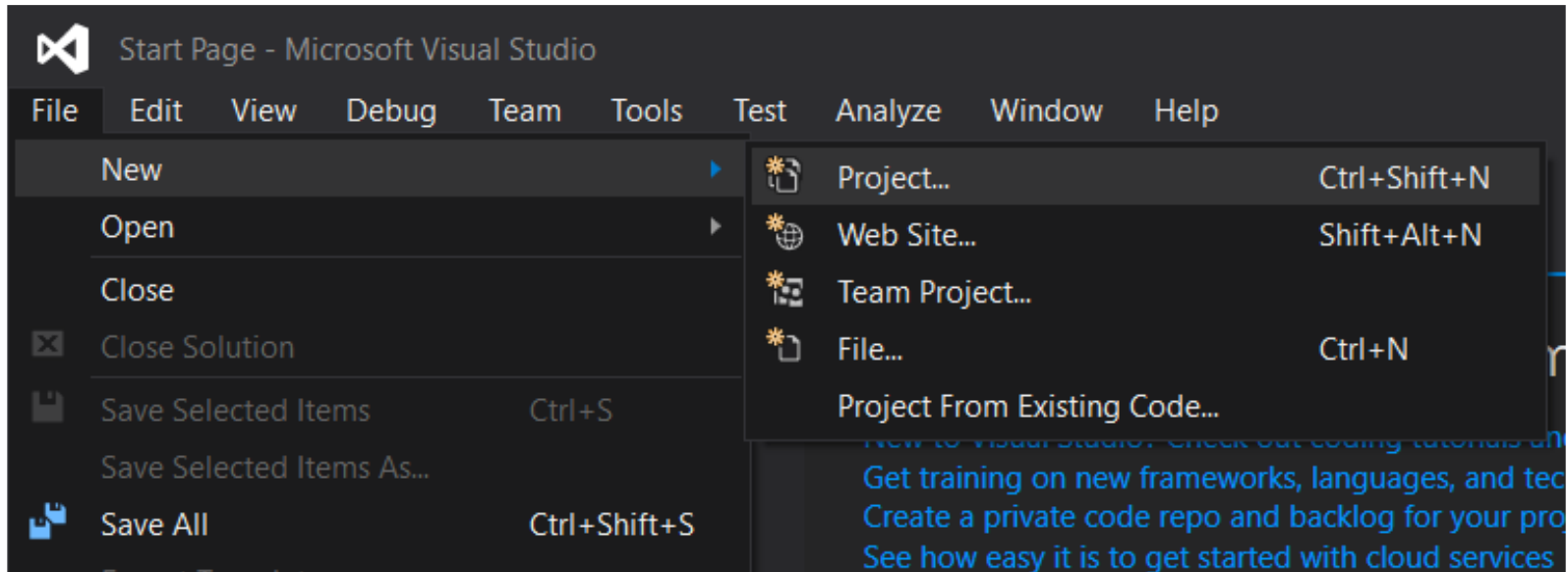
- Download and execute the setup file
- Only select [Desktop development with C++] and cancel out useless optional boxes to minimize the install package size, restart when it finishes.



# MASM Include File



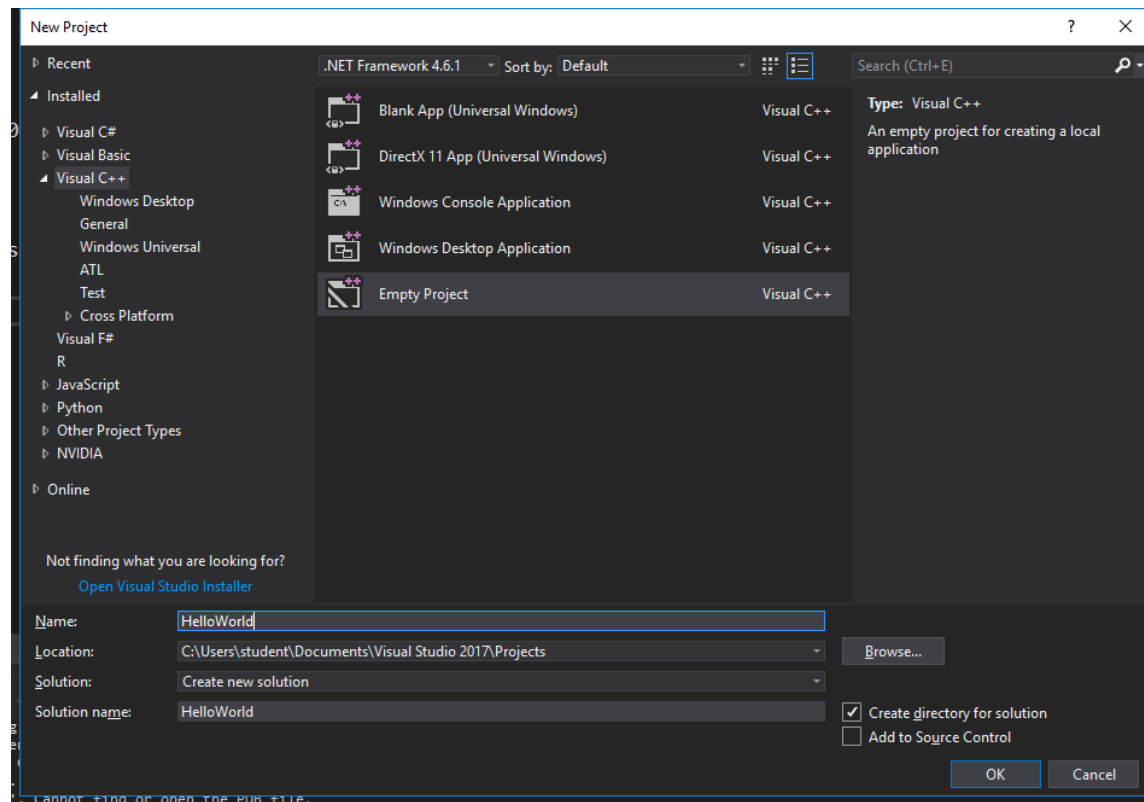
- Download the zip file and extract to any location
  - e.g. “D:\csci2510\include”
  - You can download it at: Blackboard CUHK -> Courses -> CSCI2510 -> Course Content -> masm include files
- Open the Visual Studio, and create a new project:
  - [File] > [New] > [Project]



# Get Started



- Choose [Visual C++] from left panel > [Empty Project]
- Type the project name: “HelloWorld” (or whatever you like) for our first program

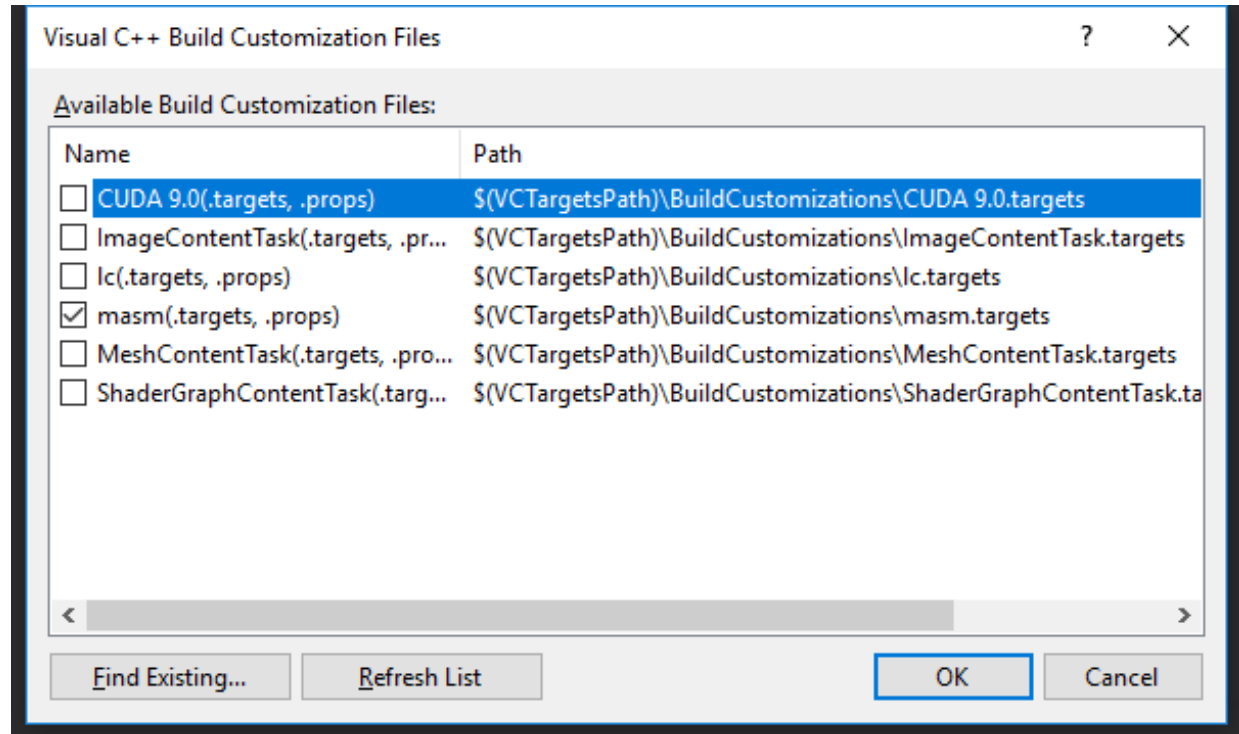
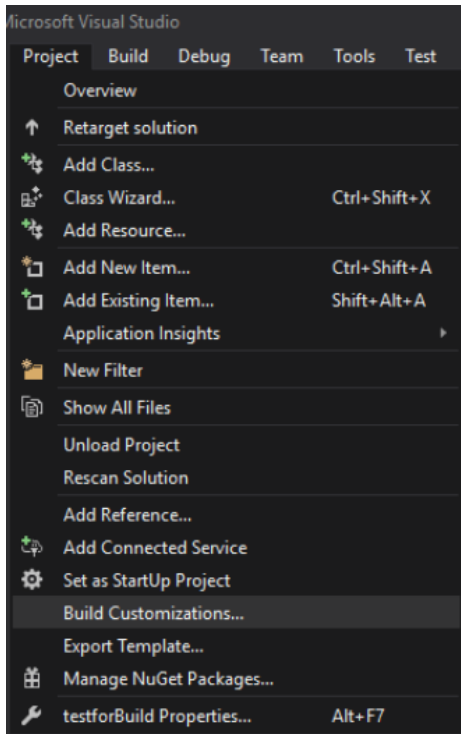




# Get Started



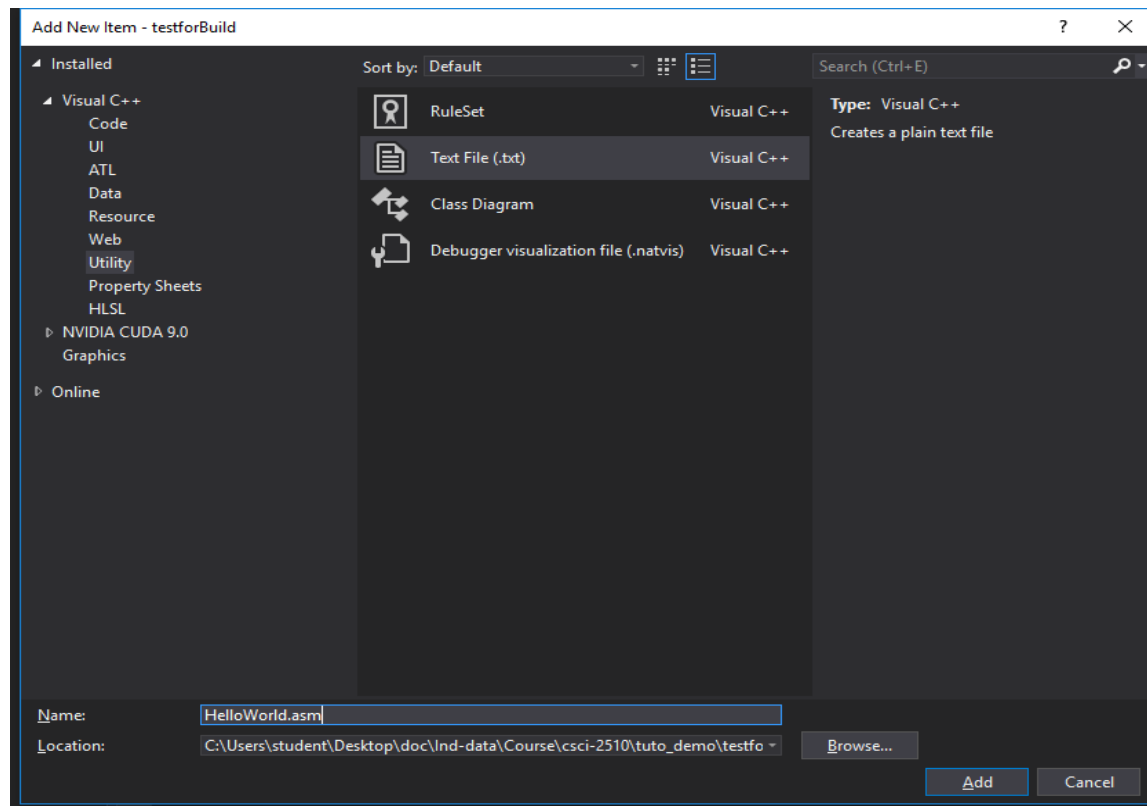
- Find [Project] > [Build Customizations]
- Check the [masm] box



# Get Started



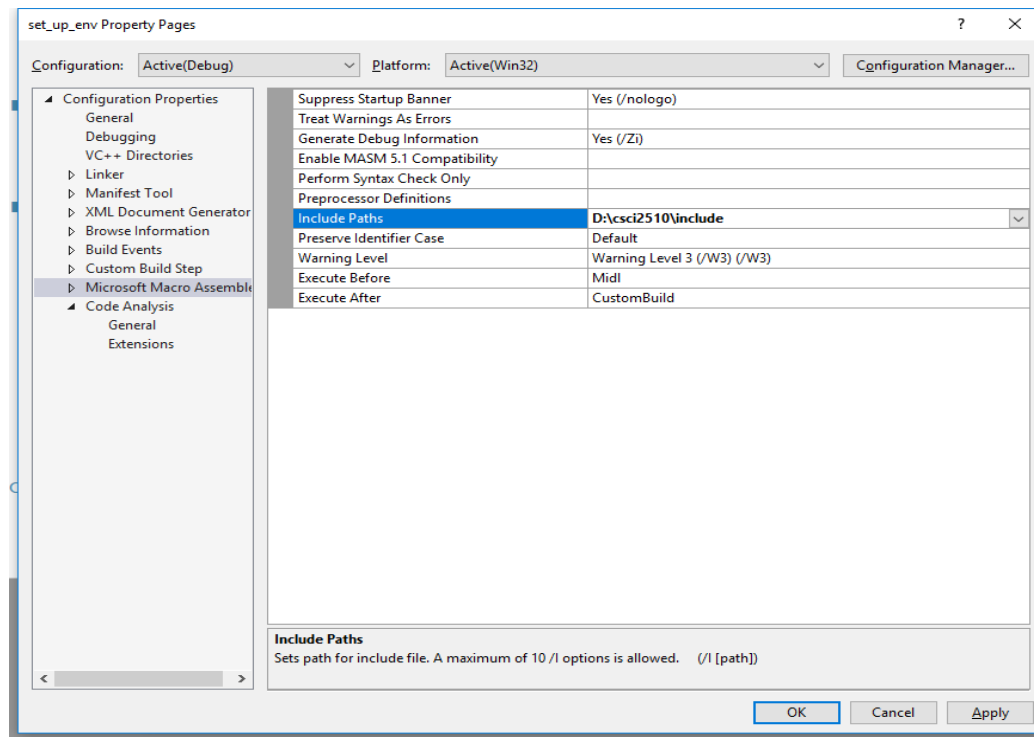
- To create and add the source file:
  - Click [Project] > [Add New Item] > [Utility] > [Text File (.txt)]
  - Type the file name (e.g. HelloWorld.asm)



# Get Started



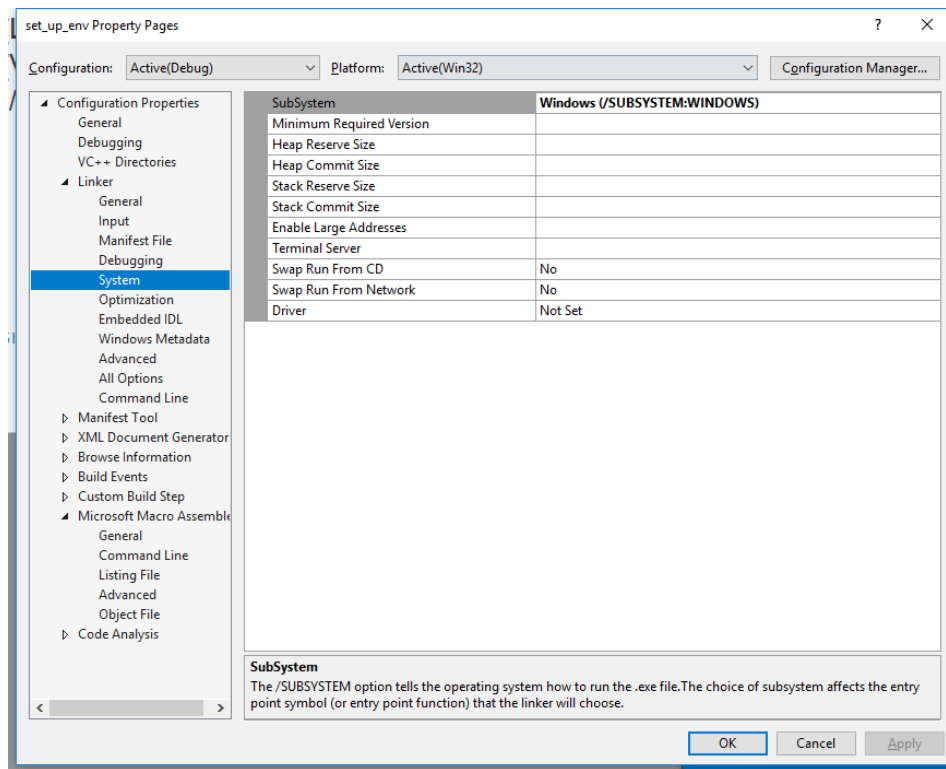
- [Project] > [Properties]:
  - In left panel, find:
    - [Microsoft Macro Assembler] > [General] > [Include Paths]
    - Insert the path where your include file locates
    - e.g. “**D:\csci2510\include**”



# Get Started



- [Project] > [Properties]:
  - In left panel, find:
    - [Linker] > [System] > [SubSystem]
    - Choose [Windows (/SUBSYSTEM:WINDOWS)]



# Hello World Source Code



```
.386
.model flat, stdcall
option casemap:none
include windows.inc
include kernel32.inc
include user32.inc

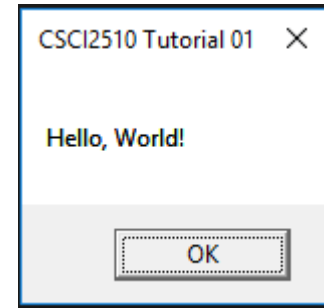
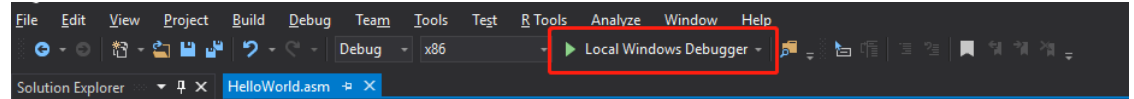
.data
MsgCaption db "CSCI2510 Tutorial 01", 0
MsgBoxText db "Hello, World!", 0

.code
start:
    invoke MessageBox , NULL,addr MsgBoxText , addr MsgCaption , MB_OK
    invoke ExitProcess, NULL
end start
```

# Build and Run



- Build: Ctrl + Shift + B
- Debug: F5
- Step Into: F11
- Step Over: F10
- Breakpoint: F9



# Another Example



```
.686  
.model flat  
.code  
start:  
mov eax , 5  
mov ebx , 10  
add eax , ebx  
end start
```

# Register Window



- To see the register value
  - [Debug] > [Windows] > [Registers]
  
- Run the example step by step
  - What can you observed in the register window?





- Set up the basic environment for MASM
- Build and run “Hello world” program