

CT5510: Computer Graphics

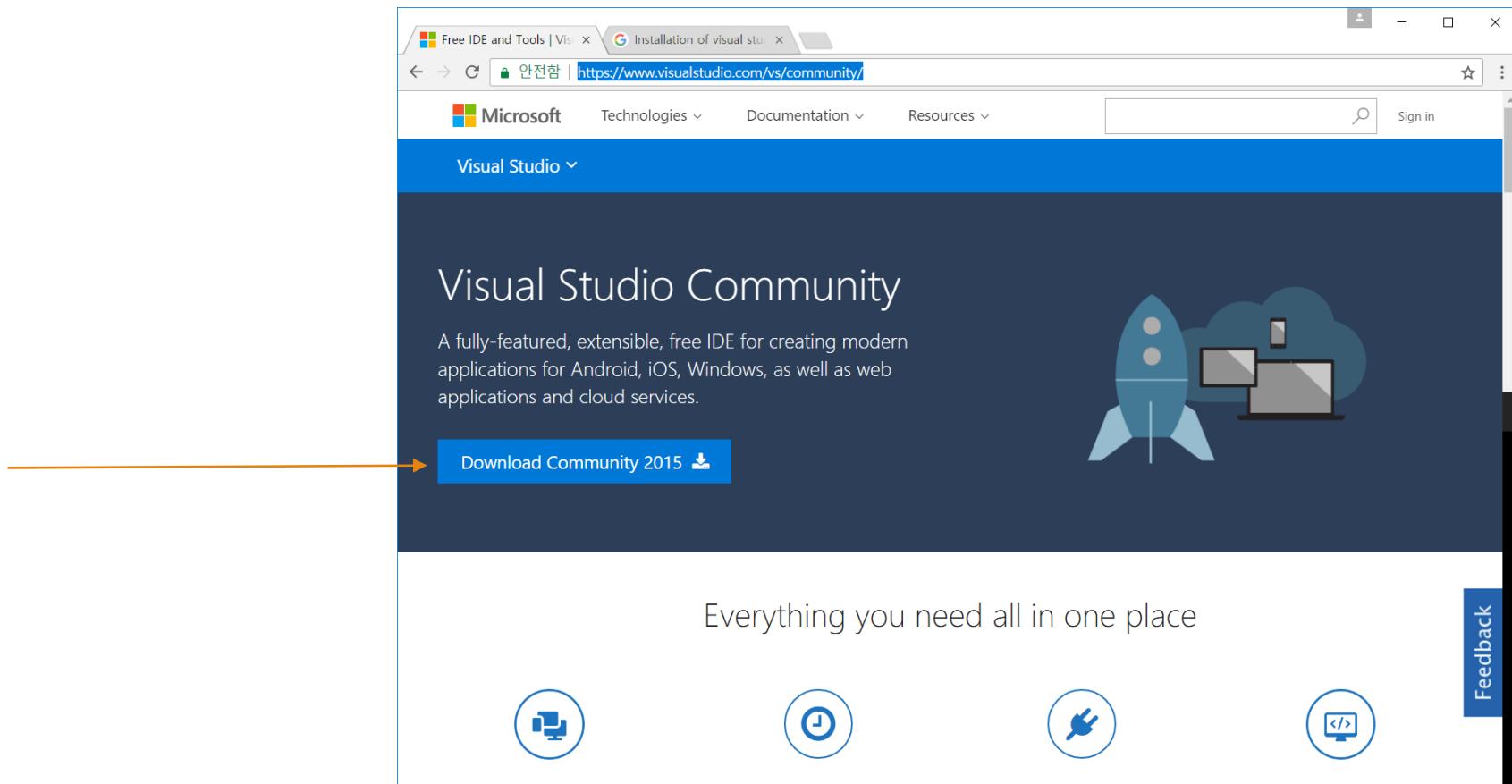
OpenGL – Hello Triangle

BOCHANG MOON

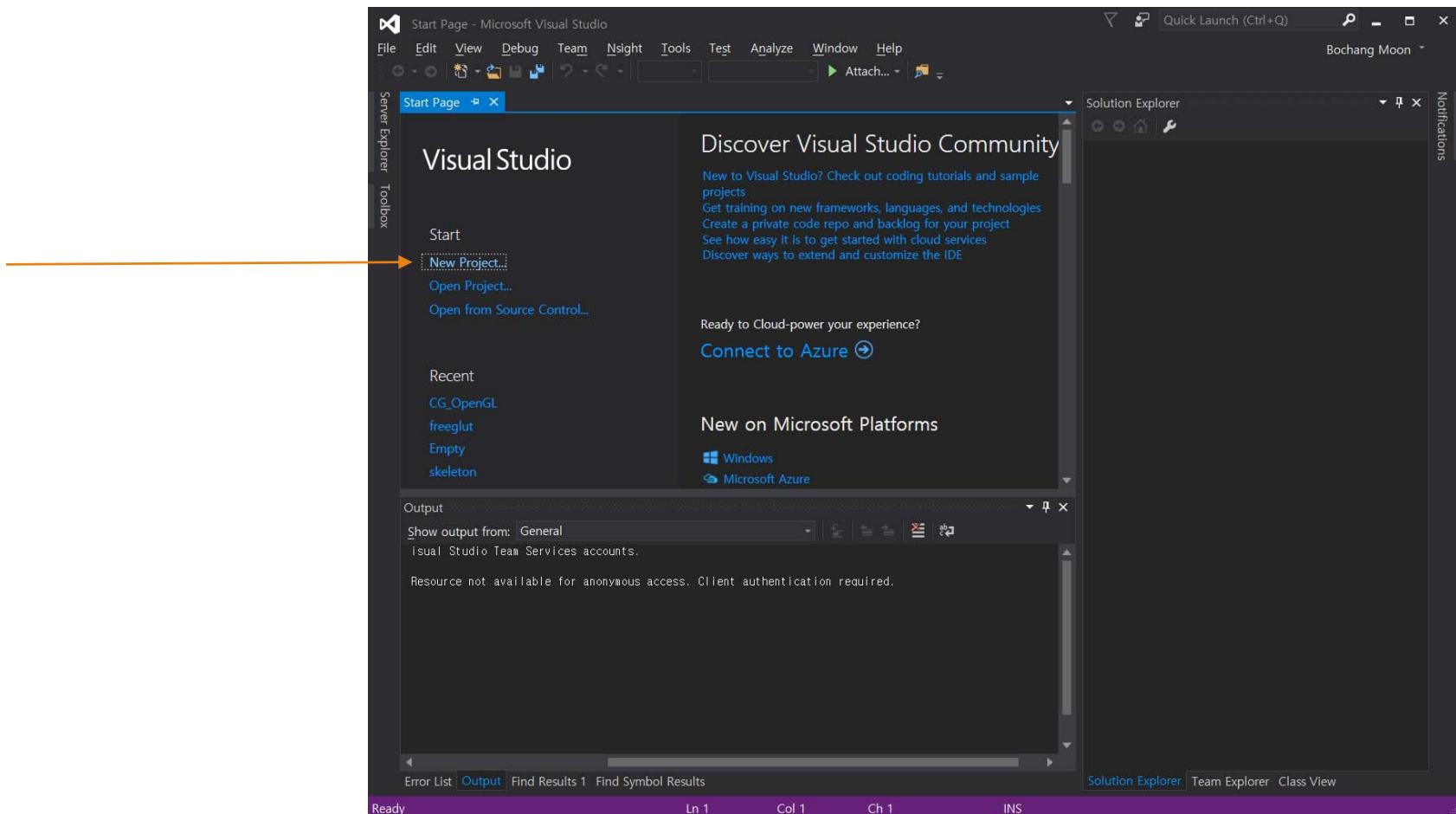


Installation of Visual Studio

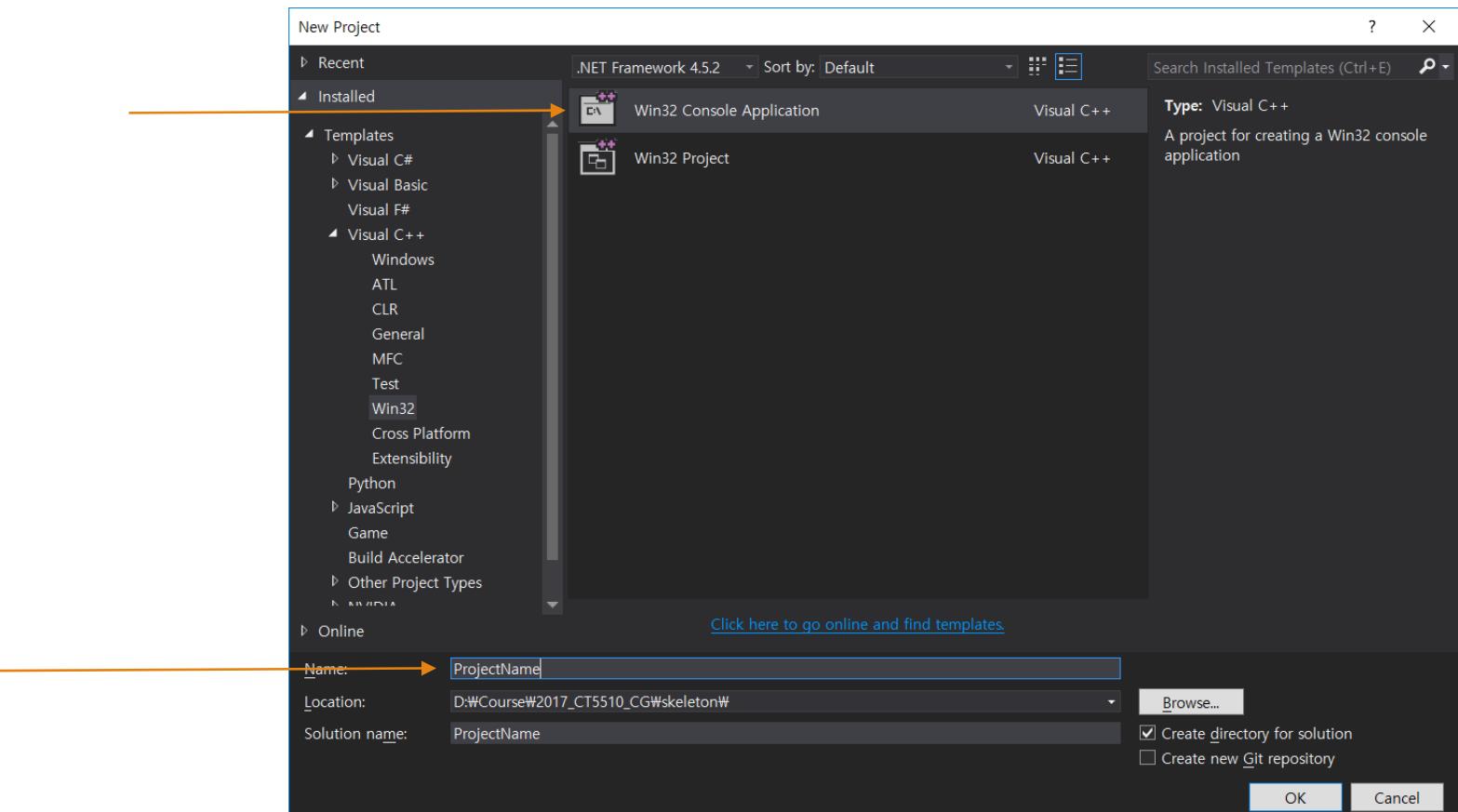
- <https://www.visualstudio.com/vs/community/>



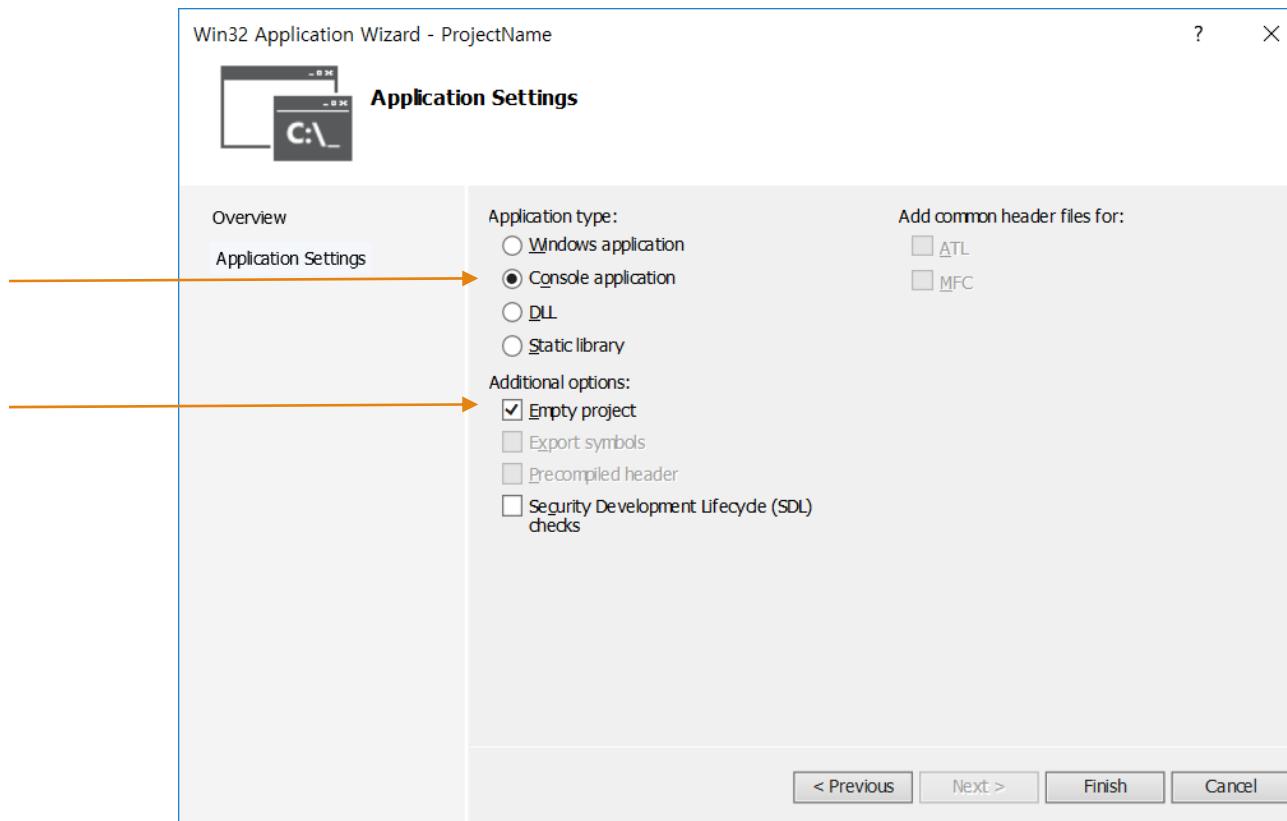
Test Hello World



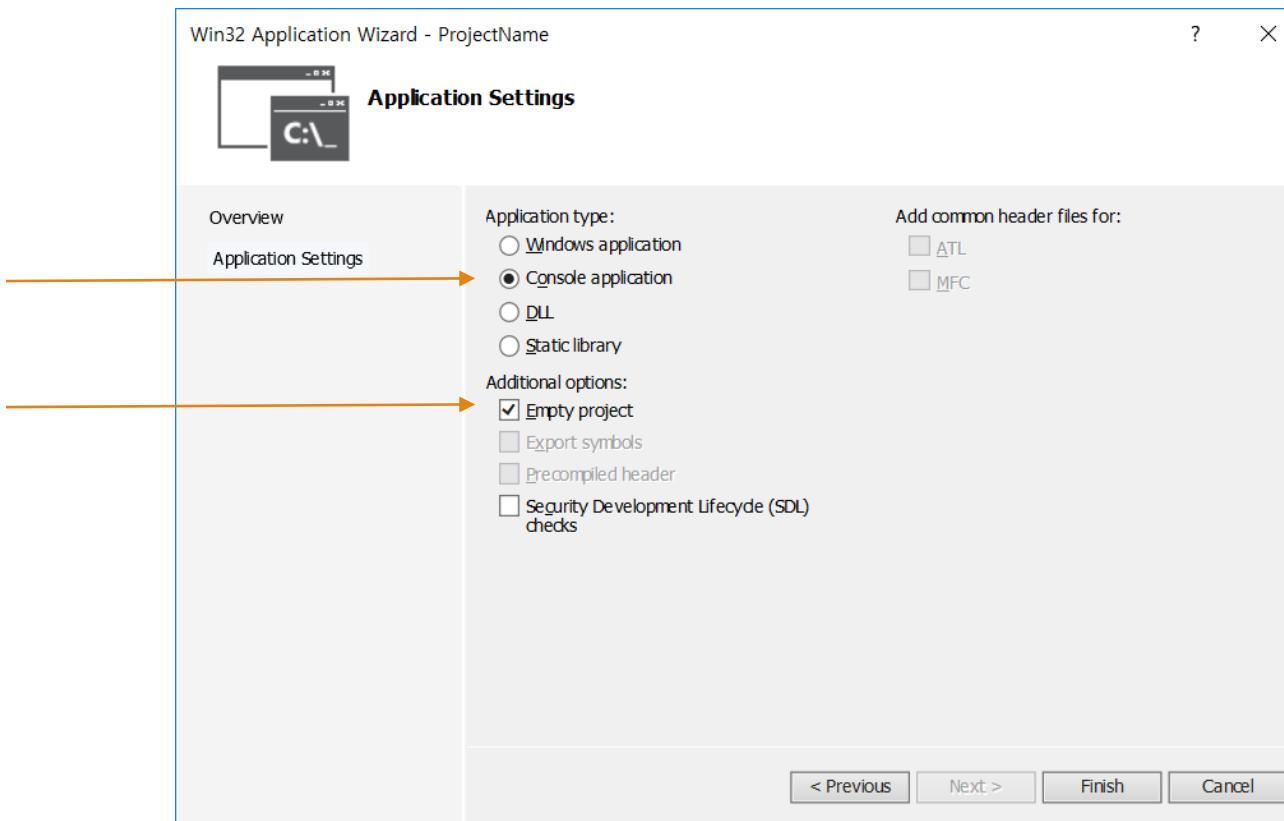
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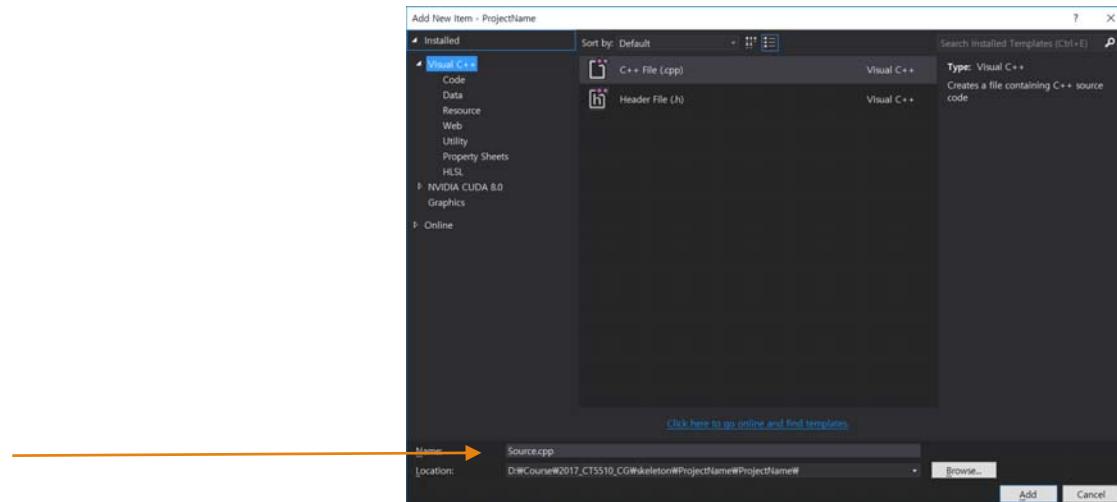
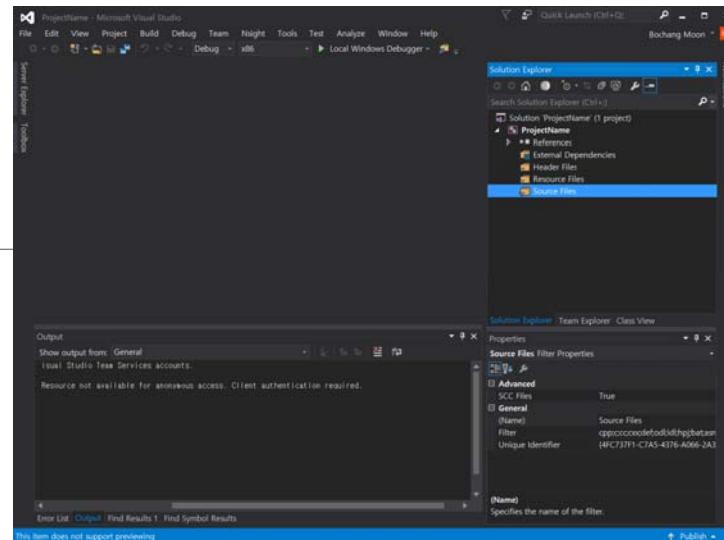


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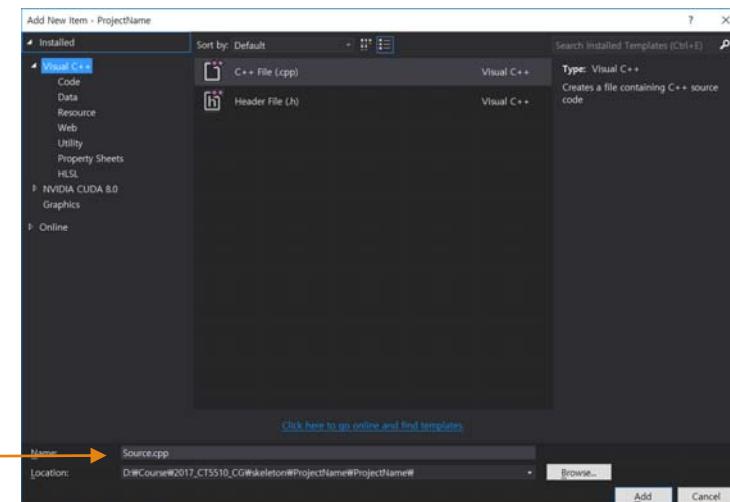
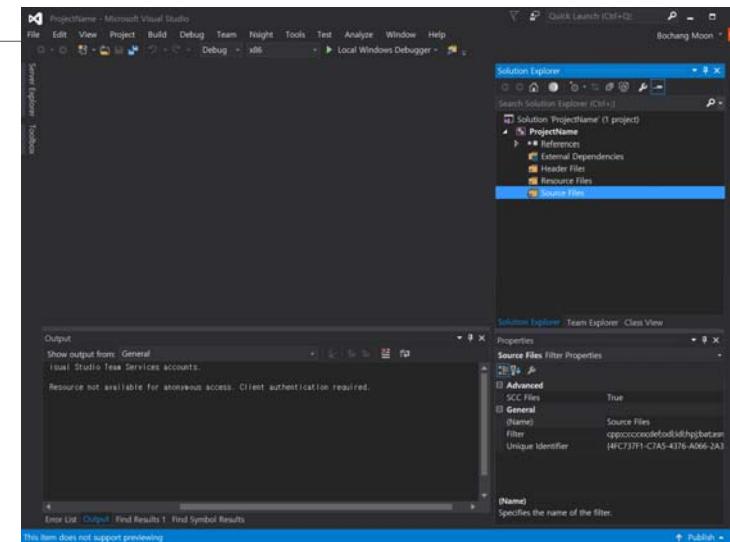
Test Hello

- Add a new code
 - Ctrl+Shift+A
- Remain your file name
 - e.g., main.cpp



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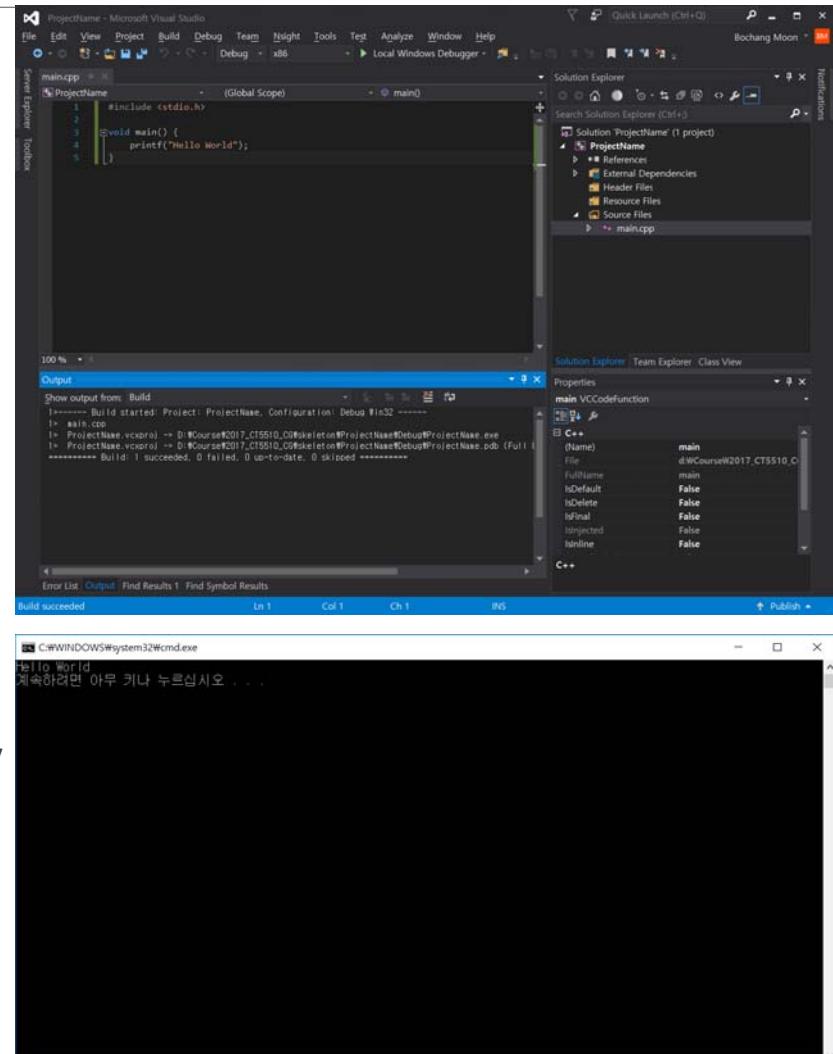


Test Hello World

- Write down your code in the main.cpp

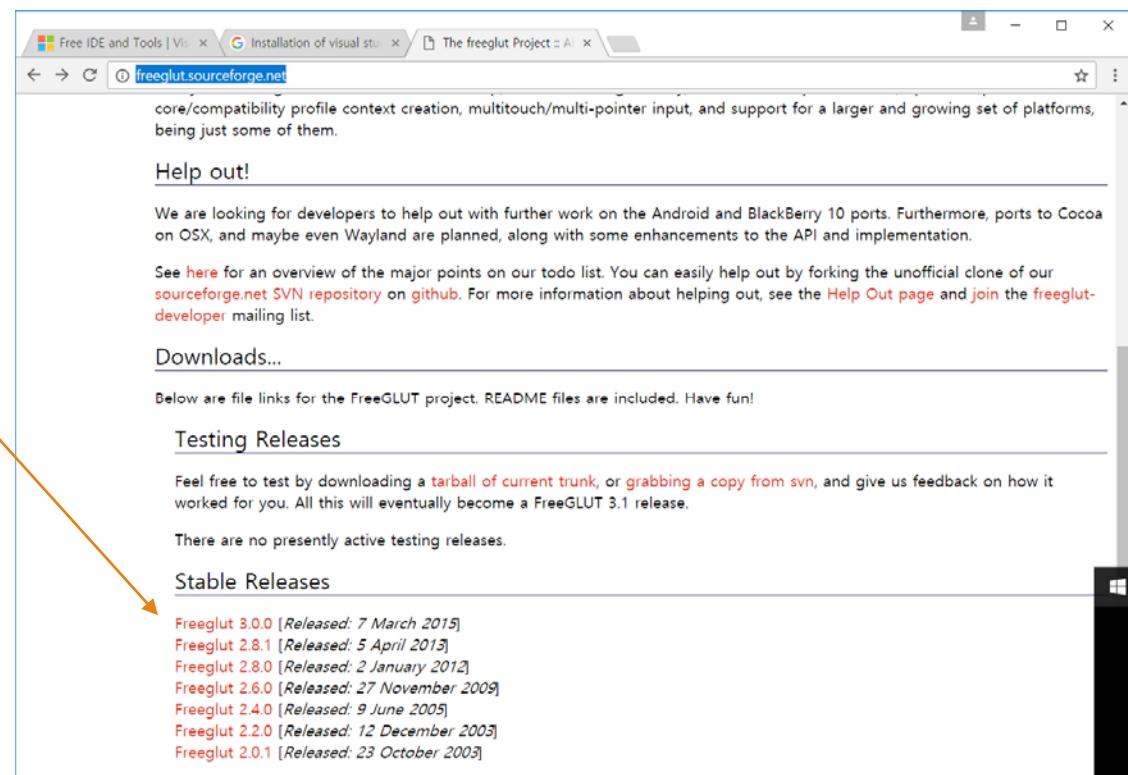
- #include <stdio.h>
- void main() {
- printf("Hello World\n");
- }

- F7
 - Compile and check whether your code is okay
- Ctrl+F5
 - Run your code



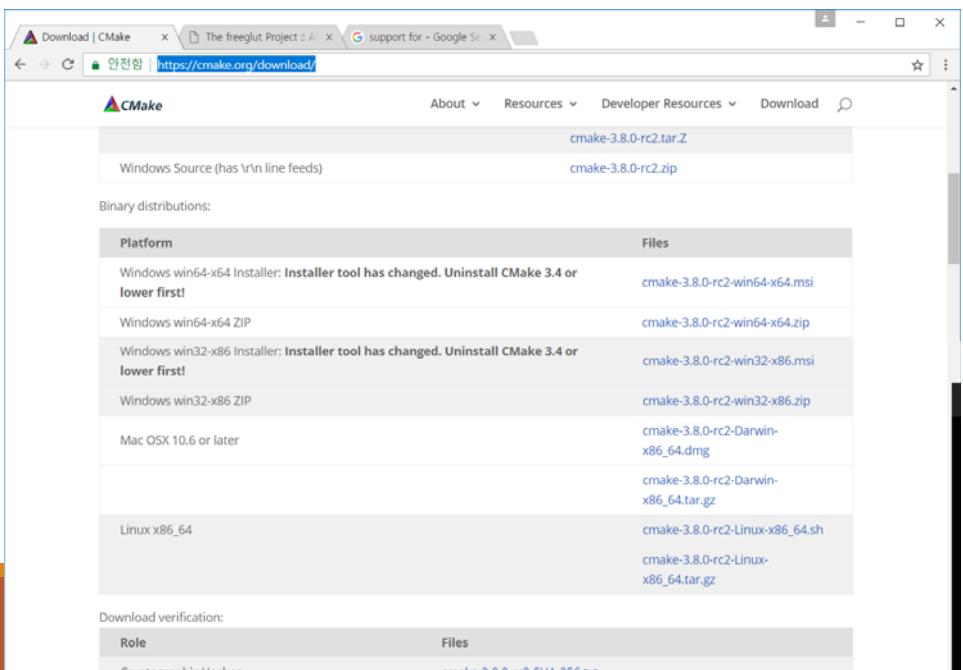
Installation of FreeGlut

- Go to
<http://freeglut.sourceforge.net/>
- Click here (Freeglut 3.0.0)
 - Download it and unzip the code



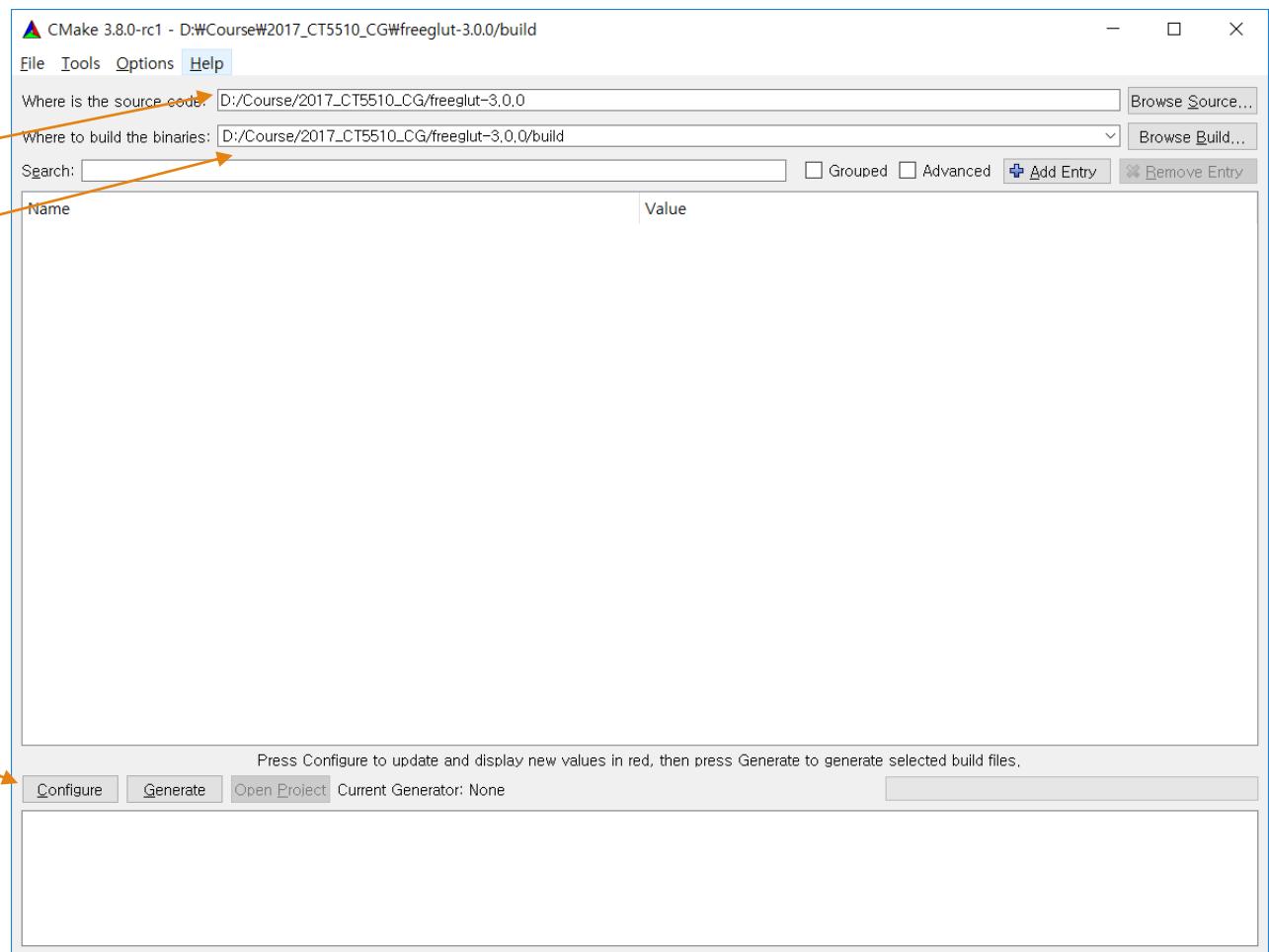
Generate FreeGlut lib. files

- Issues: no visual studio solution files...
 - How to compile and run?
- Cross-platform OpenGL utility and you need to make your solution file
- CMake
 - Widely-used program that supports for cross-platform solution
 - Go to <https://cmake.org/download/>
 - Install a Cmake version for your platform



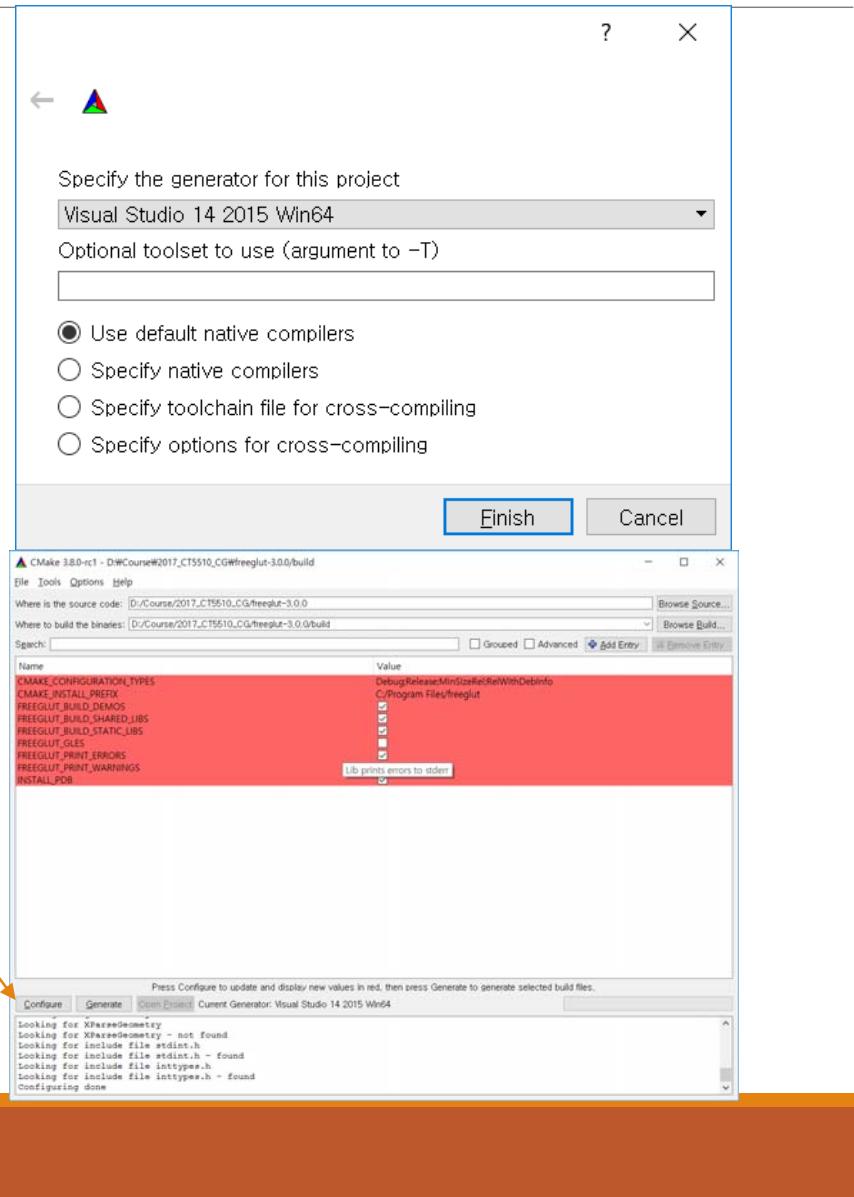
Generate FreeGlut lib. files

- Run CMake (a recent version 3.8.0)
- Specify the location of the freeglut
- Where to locate your solution
 - A common name
 -/build
- Click Configure



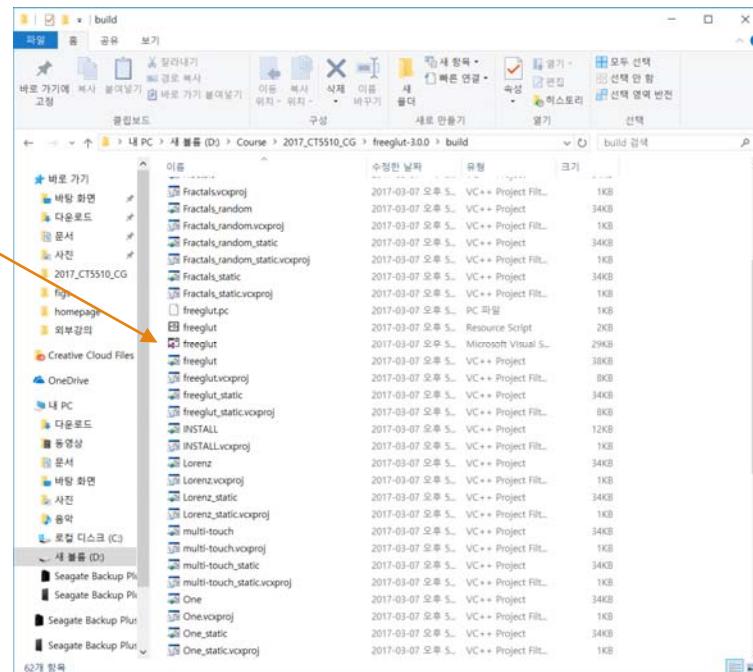
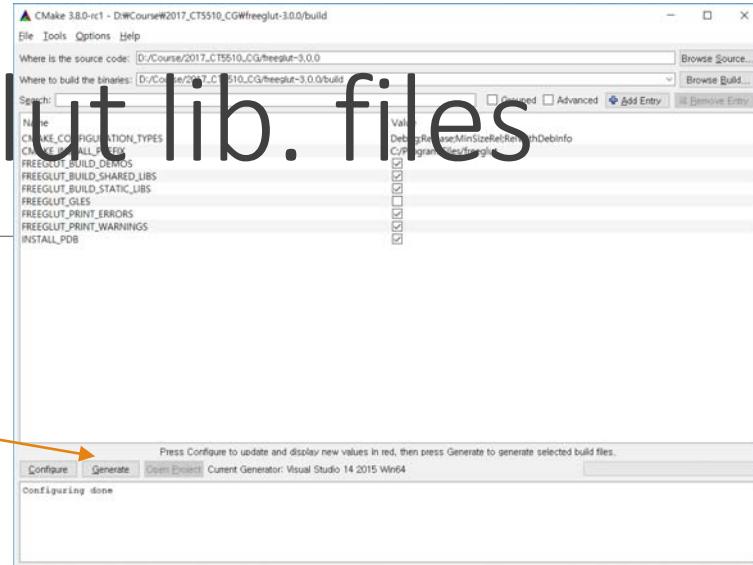
Generate FreeGlut lib. files

- Specify your visual studio version
- Click Configure again



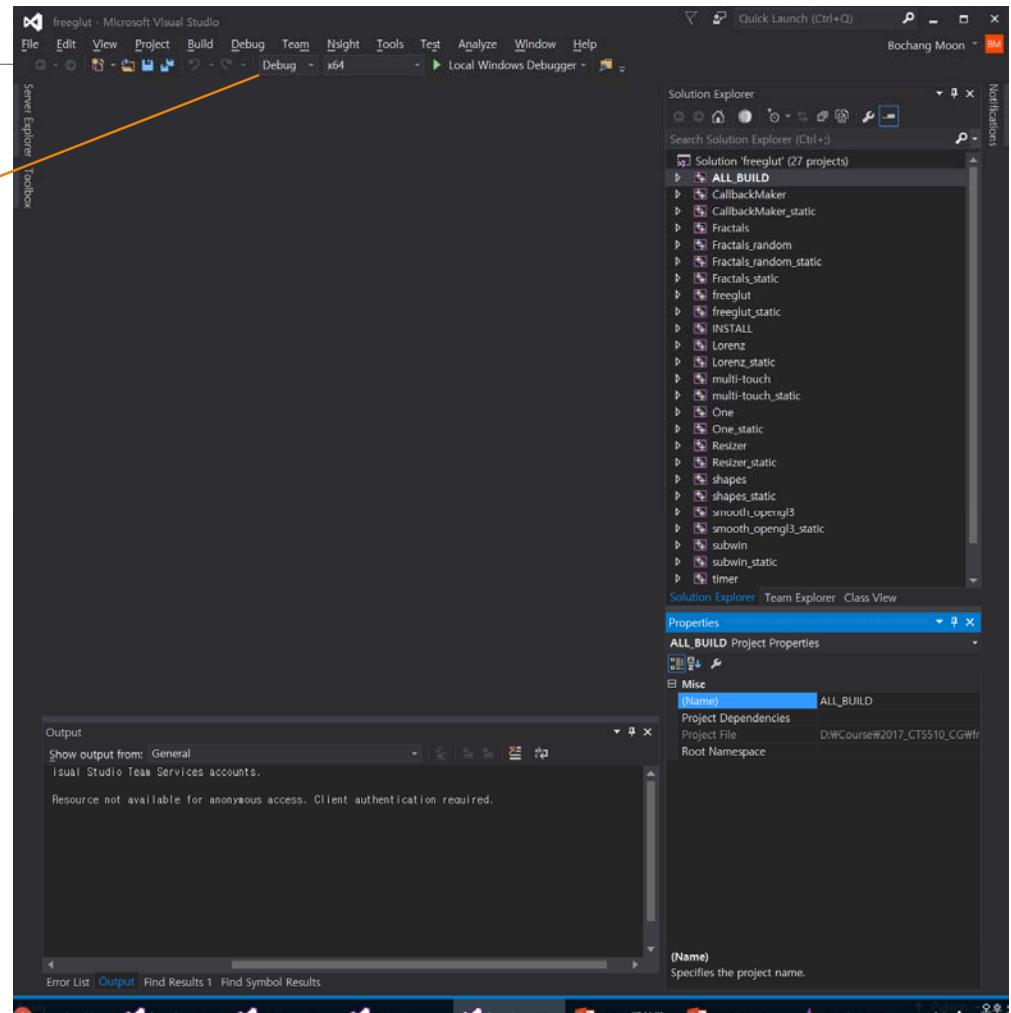
Generate FreeGlut lib. files

- Click Generate
- Go to the location of your solution file
 - If you can see the solution file, you are okay to go
 - Double-click the solution file



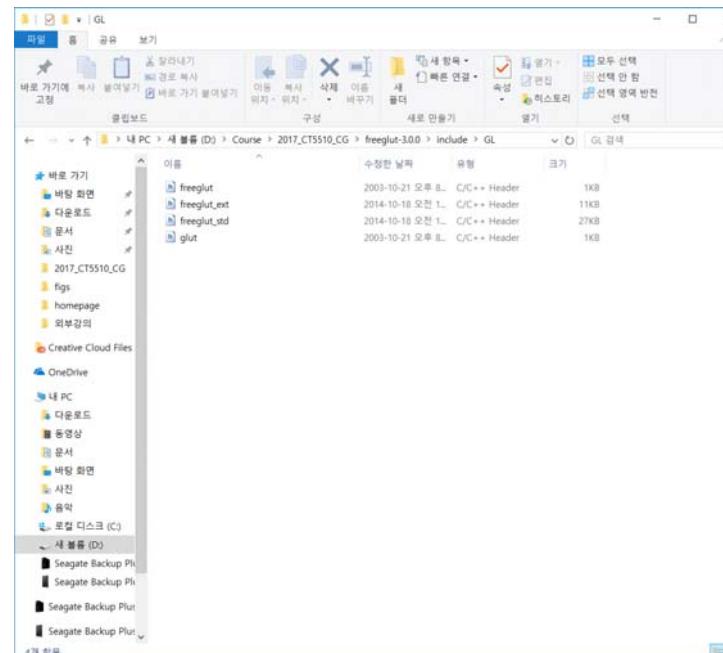
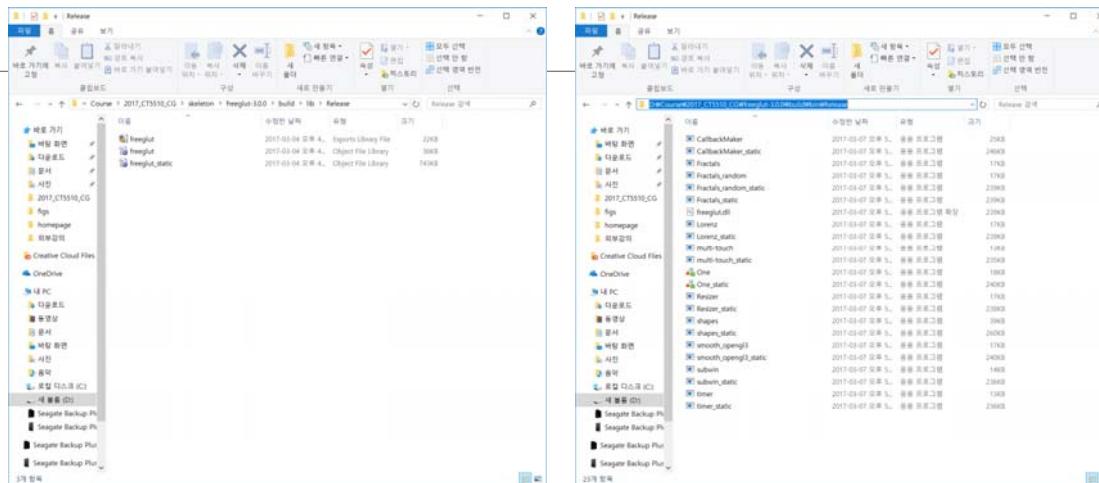
Generate FreeGlut lib. files

- A solution with many projects
- Change the configuration “Debug” to “Release”
 - Debug: slow (only used for your debugging – i.e., finding bugs)
 - Release: fast (used for distributing your program)
- Compile (F7)



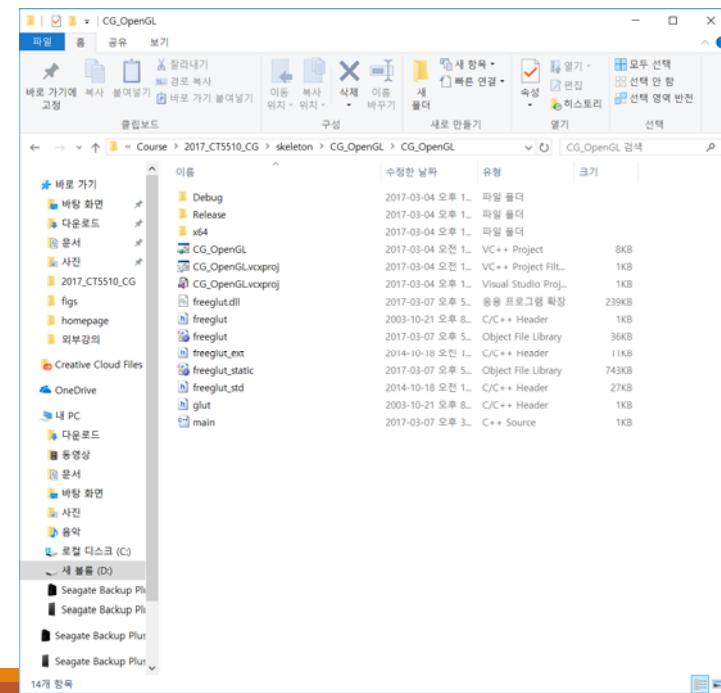
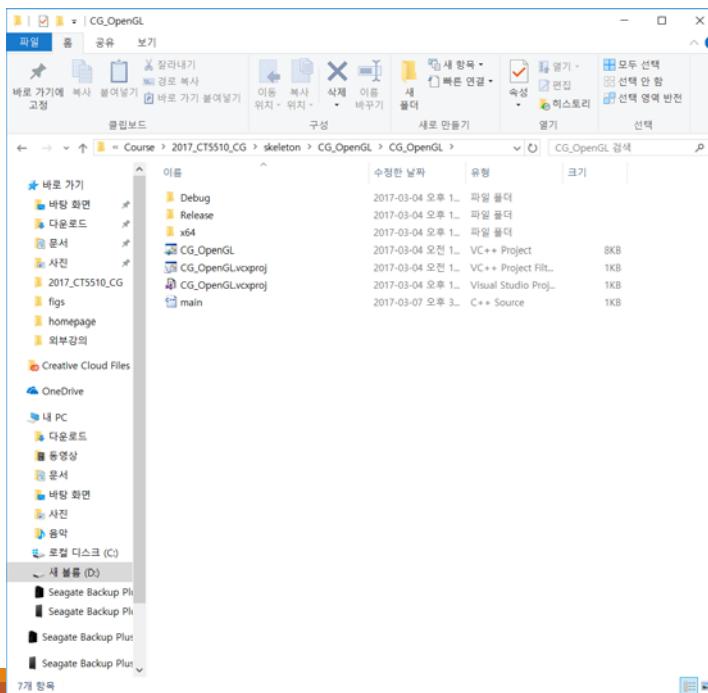
Generate FreeGlut lib. files

- Static library files
 - Your Folder/freeglut-3.0.0/build/lib/Release/*.lib
- Dynamic library files
 - Your Folder/freeglut-3.0.0/build/bin/Release/*.dll
- Header files
 - Your Folder/freeglut-3.0.0/include/GL/*.h



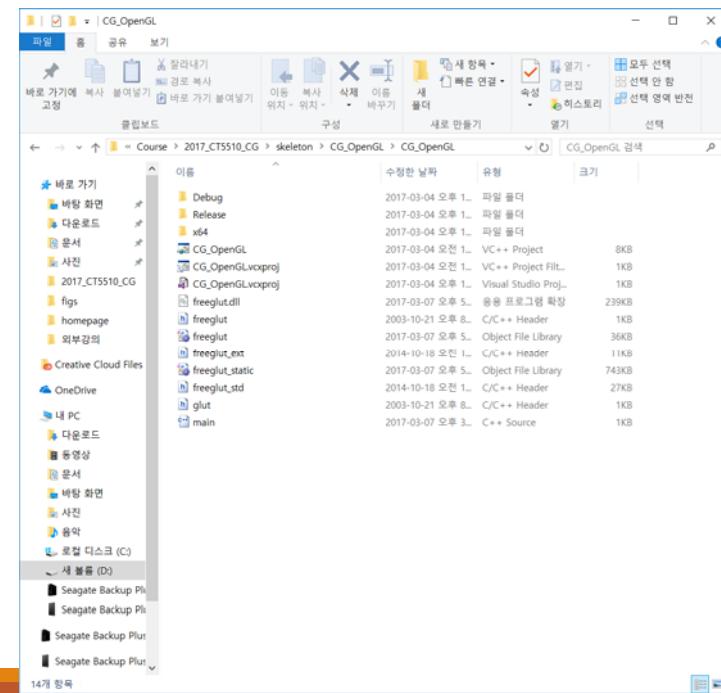
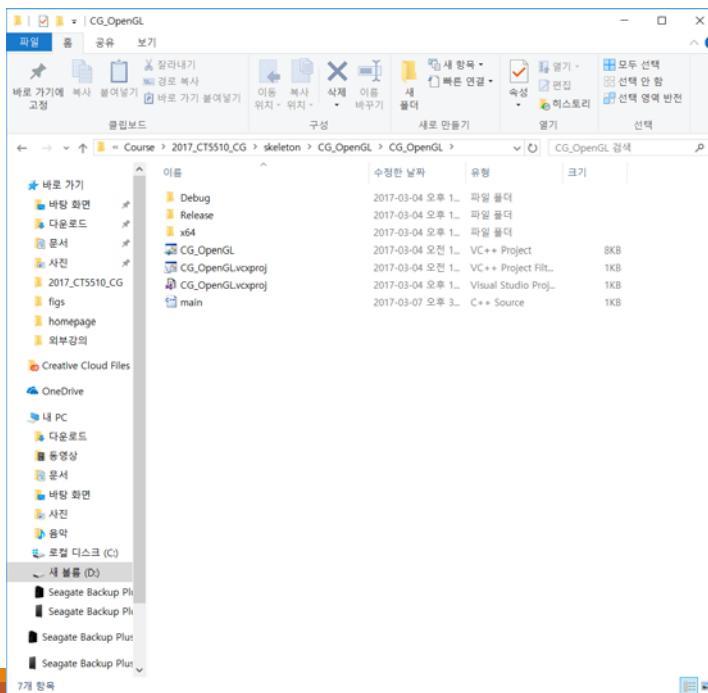
Copy the lib. files to your project

- Copy those files to your hello world **project** folder
 - Static library files
 - Dynamic library files
 - Header files



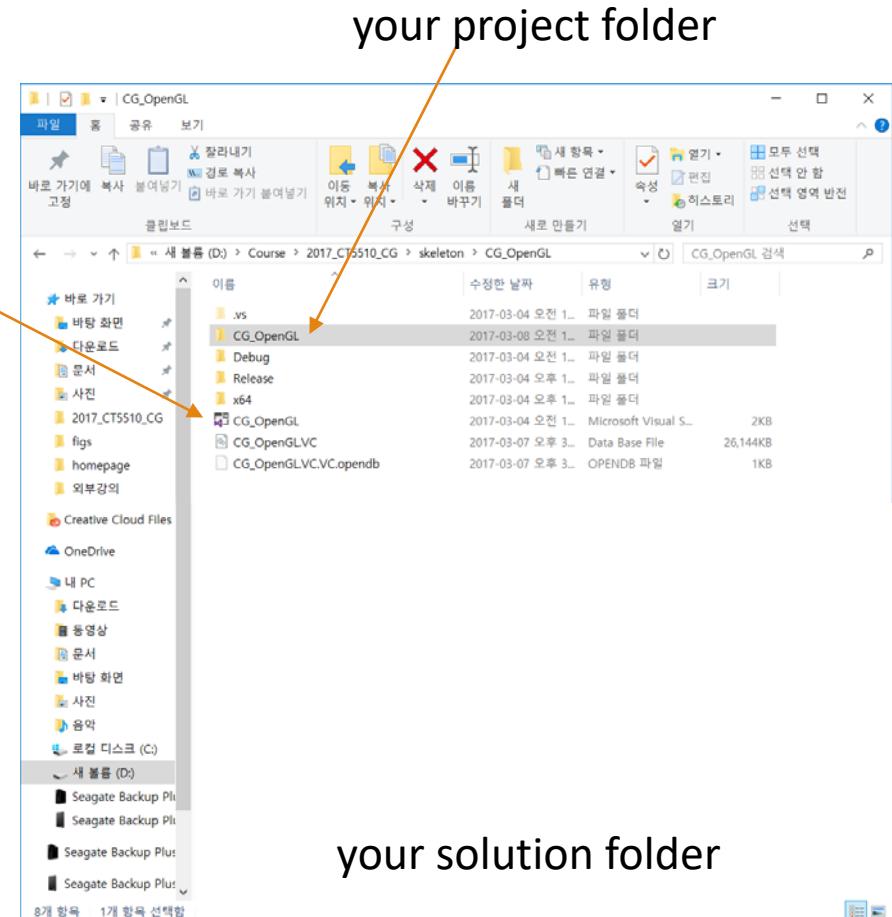
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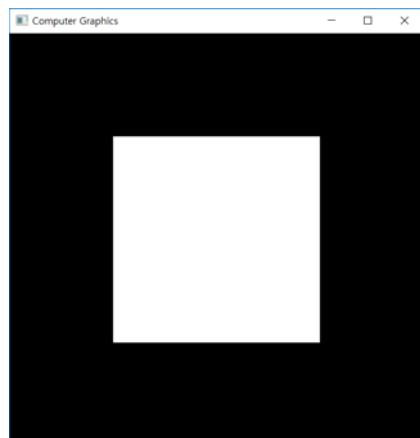
Start with Simple OpenGL

- Open your solution file
 - Your Solution Name.sln



Start with Simple OpenGL

- Write down this simple code
- Compile it (F7) and run (ctrl+F5)

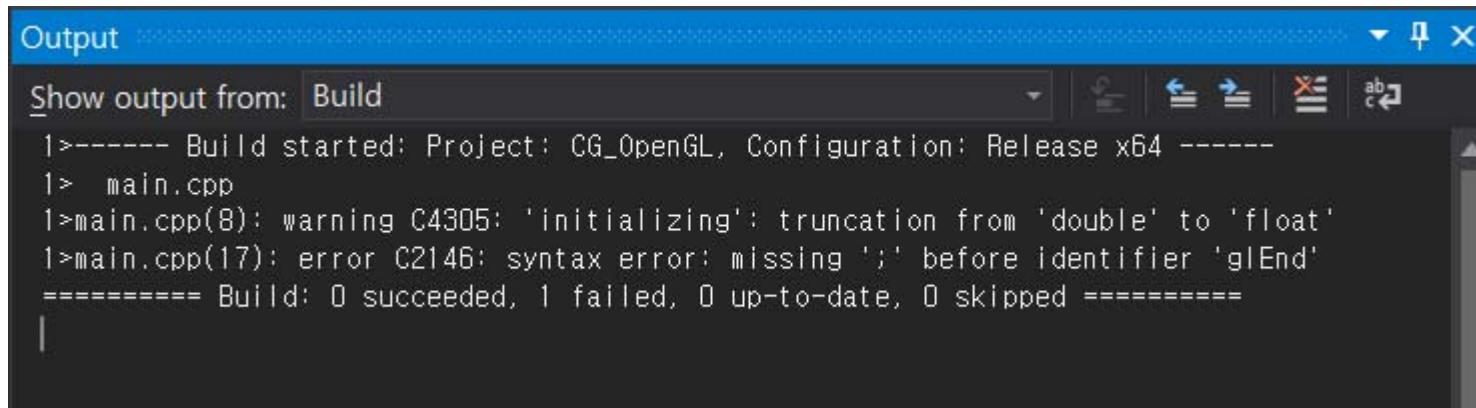


```
main.cpp*  X  CG_OpenGL  (Global Scope)
1  #pragma comment(lib,"opengl32.lib")
2  #pragma comment(lib,"glu32.lib")
3  #pragma comment(lib,"freeglut_static.lib")
4  #include "freeglut.h"
5  #include <GL/glut.h>
6  #include <math.h>
7
8  const float PI = 3.14159265359;
9
10 void display() {
11     glClearColor(0, 0, 0, 0);    // Clear the screen
12     glBegin(GL_QUADS);
13     glVertex2d(-0.5, -0.5);
14     glVertex2d(-0.5, 0.5);
15     glVertex2d(0.5, 0.5);
16     glVertex2d(0.5, -0.5);
17     glEnd();
18     glFlush();
19 }
20
21 void main(int argc, char* argv[]) {
22     glutInit(&argc, argv);
23     glutInitDisplayMode(GLUT_SINGLE | GLUT_RGBA);
24     glutInitWindowSize(512, 512);
25     glutInitWindowPosition(100, 100);
26     glutCreateWindow("Computer Graphics");
27     glutDisplayFunc(display);
28     glutMainLoop();
29 }
```

Can't compile?

- Check your output window
 - Compiler will give some hints
- Still unclear?
 - Google the error code (C2146)

```
void display() {  
    glClearColor(0, 0, 0, 0); // Clear the screen  
    glBegin(GL_QUADS);  
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    glVertex2d(0.5, 0.5);  
    glVertex2d(0.5, -0.5)|  
    glEnd();  
    glFlush();  
}
```



The screenshot shows the 'Output' window from a development environment. The title bar says 'Output'. The dropdown menu says 'Show output from: Build'. The main area displays the build log:

```
1>----- Build started: Project: CG_OpenGL, Configuration: Release x64 -----  
1> main.cpp  
1>main.cpp(8): warning C4305: 'initializing': truncation from 'double' to 'float'  
1>main.cpp(17): error C2146: syntax error: missing ';' before identifier 'glEnd'  
===== Build: 0 succeeded, 1 failed, 0 up-to-date, 0 skipped =====
```