Practice 1

Seoul National University Graphics & Media Lab Donghoon Han



Class Introduction

- Learn Objected-Oriented Programming
 - Object-Oriented Programming
 - in C++
- Learn how to create graphical program
 - Using external library: OpenGL
- Use C++ like Korean.



Class Introduction

- TA (Han Donghoon)
 - dhhan@graphics.snu.ac.kr
 - #210, Building 133
 - 880-8879
- Office hour
 - Make appointment



Class Introduction

- Schedule
 - 10+ short program assignments (at each class)
 - 1 large program (as term project)
- Reference
 - ETL
 - Google
 - But don't copy code for assignment



Assignment Submission

- Send E-mail
 - To pmta@graphics.snu.ac.kr
 - Mail Title :
 - Practice_Week01_Assignment

Until Friday 11:59 PM

- Mail Contents
 - Student ID + Name
- Attachment
 - One Source code file
 - Write a comment about your student ID and name on the top of the attached file



Programming Environment

- IDE : Integrated development environment
- Xcode, Eclipse, C++ Builder, etc ...
- We will use "Visual Studio 2015"

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▶ ++ main.cpp	<pre>imwrite("/imageResult/v.jpg", H5VChannel(2)); //Canny(testChannel, testChannel, 50, 200, 3);</pre>		
** maxflow.cpp	<pre>//cum/p(cus/cum/cus/sub/sub/sub/sub/sub/sub/sub/sub/sub/s</pre>		
	<pre>vector<int> angles = RadonTransform(testChannel);</int></pre>		
	Point2f srcTri[3];		
	Pointer sterraps; Pointer dstrik[3];		
	Mat warp_mat(2,3,CV_32FC1); Mat warp dst;		
	Mat test_dst;		
	<pre>cout << angles(b) << endl; cout << angles(1) << endl;</pre>		
	<pre>srcTri[0] = Point2f(src.cols/2, src.rows/2);</pre>		
	<pre>srcfri[1] = srcfri[0] + Point2f(10*cos(double(angles[0])/180.0*Cv_P1), 10*sin(double(angles[0])/180.0*Cv_P1)); srcfri[2] = srcfri[0] + Point2f(10*cos(double(09)/180.0*Cv_P1), 10*sin(double(09)/180.0*Cv_P1));</pre>		
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	dstrij0] = srctij0;		
	<pre>dstTri[1] = dstTri[0] + Point2f(0,0); dstTri[2] = dstTri[0] + Point2f(0,10);</pre>		
	<pre>warp_mat = getAffineTransform(srcTri, dstTri);</pre>		
	<pre>warpAffine(src, warp_dst, warp_mat, warp_dst.size()); warpAffine(testChannel, test dst.warp_mat, test_dst.size());</pre>		
	<pre>imshow("warping", warp_dst);</pre>		
	imwrite("/imaeeResult/waro dst.iop". waro dst): 100% - *		¥
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Hello World!

- A "Hello world" program is a computer program that prints out "Hello world" on a display device.
 - It is typically one of the simplest programs possible in most programming languages.
 - By tradition, it is often the first program taught in a beginning class on a particular language.
 - It is also used to illustrate the most basic syntax of a programming language.
 - From Wikipedia





Creating Project

- New project
 - Win32 Console Application

New Project								?)	×
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Creating Project

- New project
 - Win32 Console Application
 - Empty project

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Adding .cpp file

- New project
 - Win32 Console Application
 - Empty project

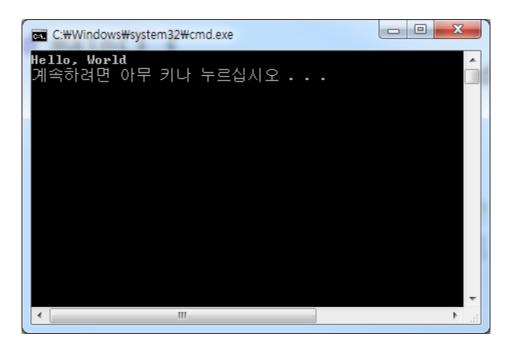
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Hello World!

```
#include <iostream>
```

```
void main() {
    std::cout << "Hello, World" << std::endl;
}</pre>
```





Hello OpenGL!

Download GLUT and Link the libraries to Visual Studio. Execute Sample Code.

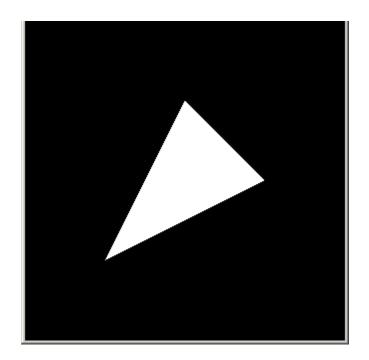
Official site : <u>www.opengl.org</u>

- OR.. just use files from TA in ETL.
- OR. <u>http://graphics.snu.ac.kr/class/pm2017/</u>



Hello OpenGL!

- Practice OpenGL
 - Create OpenGL project
 - Draw triangle



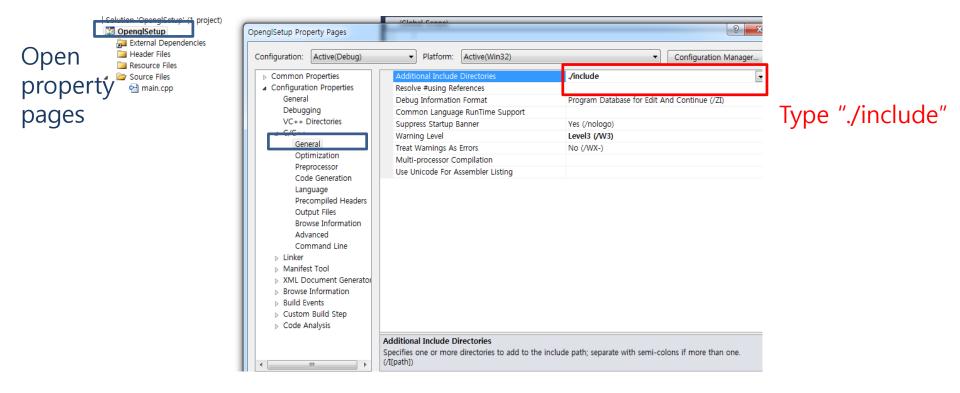


• Copy include and lib folder to your project folder(with main.cpp)

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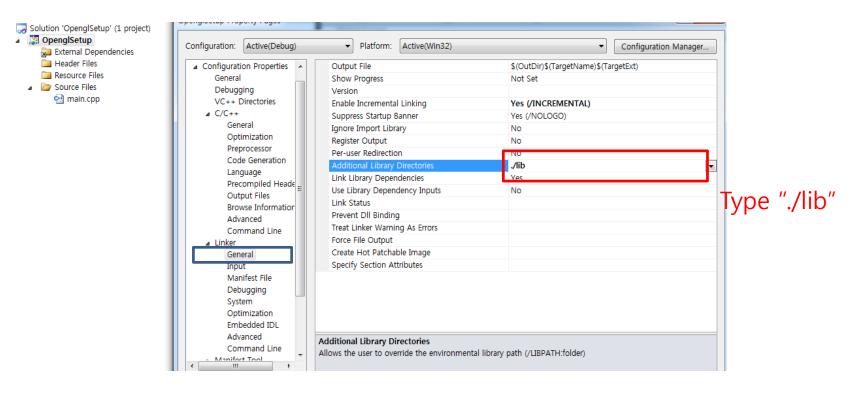


 Add "./include" at the additional include directories section in property page.



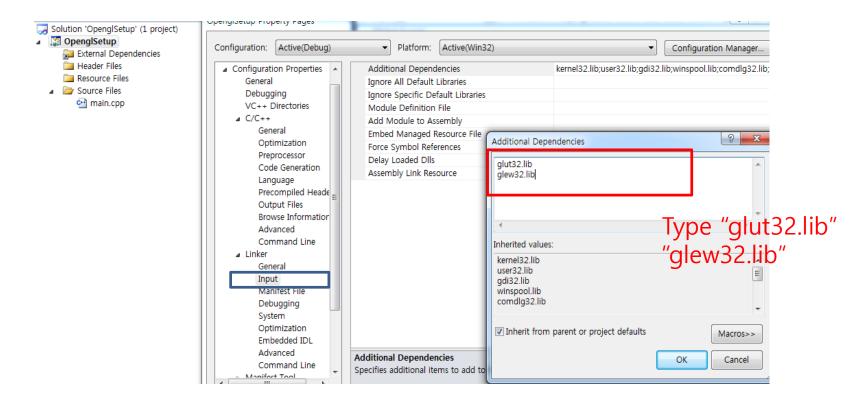


 Add "./lib" at the additional library directories section in property page.



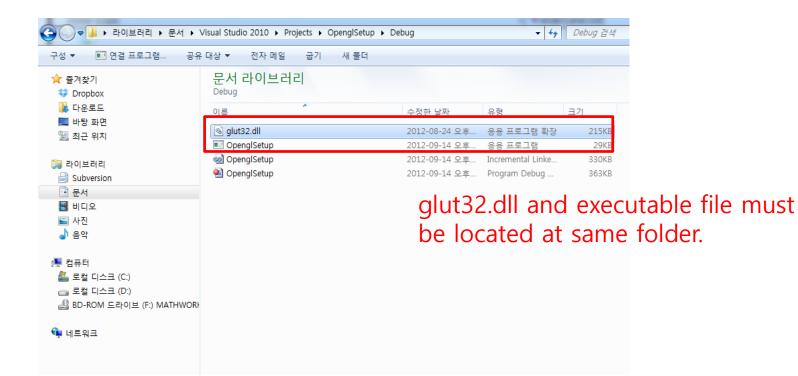


• Add "glut32.lib","glew32.lib" at additional dependencies in property page.





• Copy glut32.dll to exe folder





OpenGL sample 01

#include <GL/glut.h>

}

}

```
void renderScene(void) {
```

```
glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
              glBegin(GL_TRIANGLES);
                            glVertex3f(-0.5,-0.5,0.0);
                            glVertex3f(0.5,0.0,0.0);
                            glVertex3f(0.0,0.5,0.0);
              glEnd();
              glutSwapBuffers();
void main(int argc, char **argv) {
```

// init GLUT and create Window glutInit(&argc, argv); glutInitDisplayMode(GLUT_DEPTH | GLUT_DOUBLE | GLUT_RGBA); glutInitWindowPosition(100,100); glutInitWindowSize(320,320); glutCreateWindow("Hello OpenGL!");

```
// register callbacks
glutDisplayFunc(renderScene);
```

```
// enter GLUT event processing cycle
glutMainLoop();
```



Hello OpenGL!

