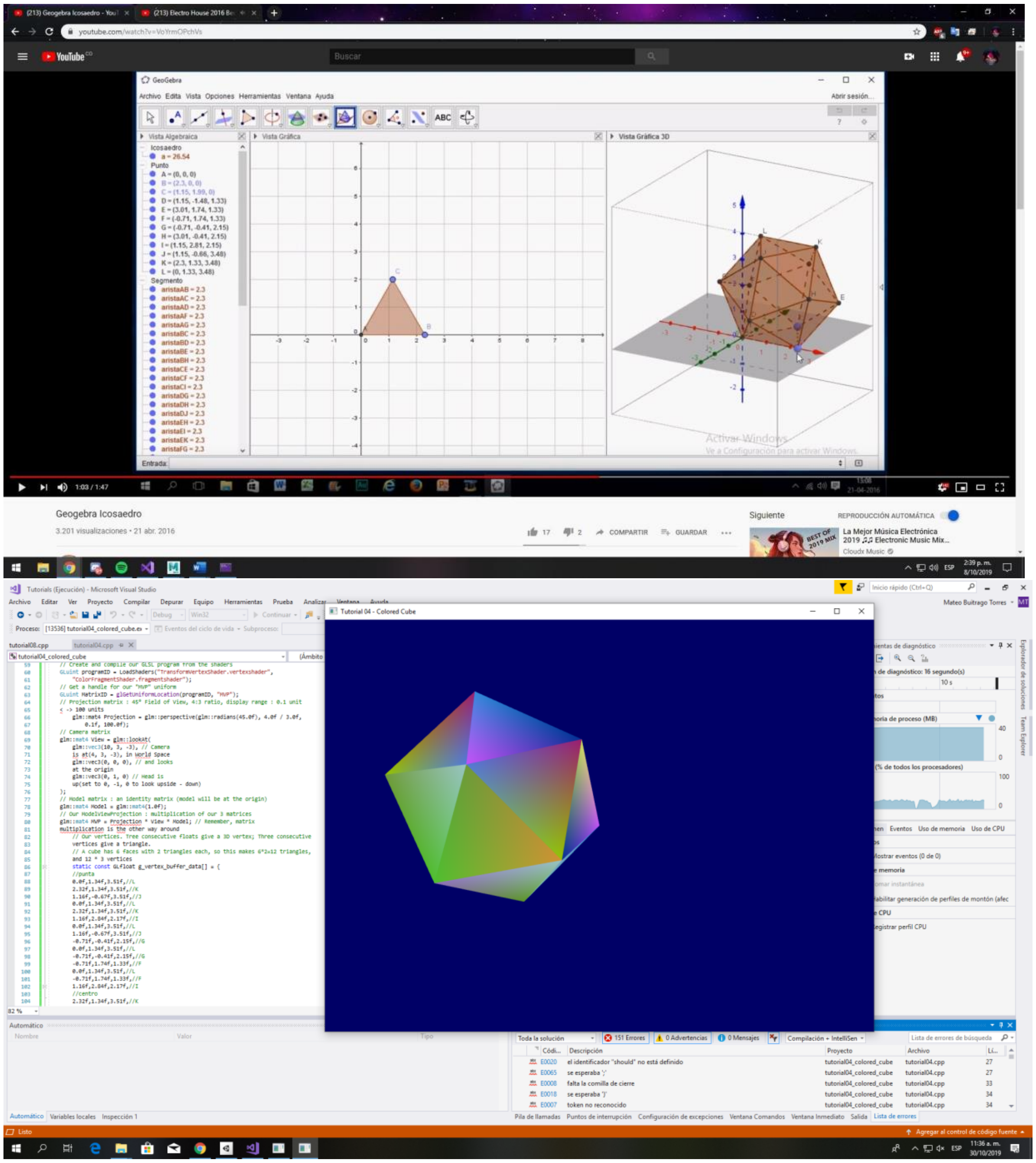
```
// Include standard headers
#include <stdio.h>
#include <stdlib.h>

// Include GLEW
#include <GL/glew.h>

// Include GLFW
#include <GLFW/glfw3.h>
GLFWwindow* window;

// Include GLM
#include <glm/glm.hpp>
#include <glm/gtc/matrix_transform.hpp> using
namespace glm;

#include <common/shader.hpp>

int main( void )
{
       // Initialise GLFW
       if( !glfwInit() )
       {
              fprintf( stderr, "Failed to initialize GLFW\n" );
              getchar();
       return -1;
       }

       glfwWindowHint(GLFW_SAMPLES, 4);
       glfwWindowHint(GLFW_CONTEXT_VERSION_MAJOR, 3);
       glfwWindowHint(GLFW_CONTEXT_VERSION_MINOR, 3);
       glfwWindowHint(GLFW_OPENGL_FORWARD_COMPAT, GL_TRUE); // To make MacOS happy;
should not be needed       glfwWindowHint(GLFW_OPENGL_PROFILE,
GLFW_OPENGL_CORE_PROFILE);
       // Open a window and create its OpenGL context        window =
glfwCreateWindow( 1024, 768, "Tutorial 04 - Colored Cube", NULL, NULL);
       if( window == NULL ){             fprintf( stderr, "Failed to open GLFW
window. If you have an Intel GPU, they are not 3.3 compatible. Try the 2.1 version
of the tutorials.\n" );
              getchar();
       glfwTerminate();
              return -1;
       }
       glfwMakeContextCurrent(window);

       // Initialize GLEW
       glewExperimental = true; // Needed for core profile
       if (glewInit() != GLEW_OK) {      fprintf(stderr,
       "Failed to initialize GLEW\n");   getchar();
       glfwTerminate();
              return -1;
       }
```

```
	// Ensure we can capture the escape key being pressed below
	glfwSetInputMode(window, GLFW_STICKY_KEYS, GL_TRUE);
	// Dark blue background
	glClearColor(0.0f, 0.0f, 0.4f, 0.0f);

	// Enable depth test glEnable(GL_DEPTH_TEST);
	// Accept fragment if it closer to the camera than the former one
	glDepthFunc(GL_LESS);

	GLuint VertexArrayID;
	glGenVertexArrays(1, &VertexArrayID);
	glBindVertexArray(VertexArrayID);

	// Create and compile our GLSL program from the shaders
	GLuint programID = LoadShaders( "TransformVertexShader.vertexshader",
"ColorFragmentShader.fragmentshader" );

	// Get a handle for our "MVP" uniform
	GLuint MatrixID = glGetUniformLocation(programID, "MVP");

	 // Projection matrix : 45° Field of View, 4:3 ratio, display range : 0.1 unit
<-> 100 units	glm::mat4 Projection =
glm::perspective(glm::radians(45.0f), 4.0f / 3.0f,
0.1f, 100.0f);
	// Camera matrix
	glm::mat4 View       = glm::lookAt(
								glm::vec3(10,3,-3), // Camera
is at (4,3,-3), in World Space
								glm::vec3(0,0,0), // and looks
at the origin
								glm::vec3(0,1,0)  // Head is
up (set to 0,-1,0 to look upside-down)
						   );
	// Model matrix : an identity matrix (model will be at the origin)
	glm::mat4 Model      = glm::mat4(1.0f);
	// Our ModelViewProjection : multiplication of our 3 matrices
	glm::mat4 MVP        = Projection * View * Model; // Remember, matrix
multiplication is the other way around

	// Our vertices. Tree consecutive floats give a 3D vertex; Three consecutive
vertices give a triangle.
	// A cube has 6 faces with 2 triangles each, so this makes 6*2=12 triangles,
and 12*3 vertices	static const GLfloat g_vertex_buffer_data[] = {
		//punta
		0.0f,1.34f,3.51f,//L
		2.32f,1.34f,3.51f,//K
		1.16f,-0.67f,3.51f,//J

		0.0f,1.34f,3.51f,//L
		2.32f,1.34f,3.51f,//K
		1.16f,2.84f,2.17f,//I

		0.0f,1.34f,3.51f,//L
		1.16f,-0.67f,3.51f,//J
		-0.71f,-0.41f,2.15f,//G
```

```
0.0f,1.34f,3.51f,//L
-0.71f,-0.41f,2.15f,//G
-0.71f,1.74f,1.33f,//F

0.0f,1.34f,3.51f,//L
-0.71f,1.74f,1.33f,//F
1.16f,2.84f,2.17f,//I

//centro

2.32f,1.34f,3.51f,//K
1.16f,-0.67f,3.51f,//J
3.01f,-0.41f,2.15f,//H

2.32f,1.34f,3.51f,//K
3.01f,-0.41f,2.15f,//H
3.01f,1.74f,1.33f,//E

   1.16f,-0.67f,3.51f,//J
  3.01f,-0.41f,2.15f,//H
1.15f,-1.48f,1.33f,//D

1.16f,-0.67f,3.51f,//J
-0.71f,-0.41f,2.15f,//G
1.15f,-1.48f,1.33f,//D

-0.71f,-0.41f,2.15f,//G
-0.71f,1.74f,1.33f,//F
0.0f,0.0f,0.0f,//A

-0.71f,-0.41f,2.15f,//G
0.0f,0.0f,0.0f,//A
1.15f,-1.48f,1.33f,//D

-0.71f,1.74f,1.33f,//F
0.0f,0.0f,0.0f,//A
1.15f,1.99f,0.0f,//C

-0.71f,1.74f,1.33f,//F
1.16f,2.84f,2.17f,//I
1.15f,1.99f,0.0f,//C

1.16f,2.84f,2.17f,//I
1.15f,1.99f,0.0f,//C
3.01f,1.74f,1.33f,//E


2.32f,1.34f,3.51f,//K
      1.16f,2.84f,2.17f,//I
  3.01f,1.74f,1.33f,//E


//punta abajo
2.3f,0.0f,0.0f,//B
```

```
        3.01f,1.74f,1.33f,//E
        3.01f,-0.41f,2.15f,//H

        2.3f,0.0f,0.0f,//B
        3.01f,-0.41f,2.15f,//H
        1.15f,-1.48f,1.33f,//D

        2.3f,0.0f,0.0f,//B
        1.15f,-1.48f,1.33f,//D
        0.0f,0.0f,0.0f,//A

        2.3f,0.0f,0.0f,//B
        0.0f,0.0f,0.0f,//A
        1.15f,1.99f,0.0f,//C

        2.3f,0.0f,0.0f,//B
        1.15f,1.99f,0.0f,//C
        3.01f,1.74f,1.33f,//E




};

// One color for each vertex. They were generated randomly.
static const GLfloat g_color_buffer_data[] = {
        0.583f,  0.771f,  0.014f,
        0.609f,  0.115f,  0.436f,
        0.327f,  0.483f,  0.844f,
0.822f,  0.569f,  0.201f,
0.435f,  0.602f,  0.223f,
0.310f,  0.747f,  0.185f,
0.597f,  0.770f,  0.761f,
0.559f,  0.436f,  0.730f,
0.359f,  0.583f,  0.152f,
0.483f,  0.596f,  0.789f,
        0.559f,  0.861f,  0.639f,
        0.195f,  0.548f,  0.859f,
0.014f,  0.184f,  0.576f,
0.771f,  0.328f,  0.970f,
        0.583f,  0.771f,  0.014f,

        0.609f,  0.115f,  0.436f,
0.327f,  0.483f,  0.844f,
0.822f,  0.569f,  0.201f,
        0.435f,  0.602f,  0.223f,
        0.310f,  0.747f,  0.185f,
        0.597f,  0.770f,  0.761f,
        0.559f,  0.436f,  0.730f,
0.359f,  0.583f,  0.152f,
        0.483f,  0.596f,  0.789f,
        0.559f,  0.861f,  0.639f,
        0.195f,  0.548f,  0.859f,
        0.014f,  0.184f,  0.576f,
		0.771f,  0.328f,  0.970f,

		0.583f,  0.771f,  0.014f,
		0.609f,  0.115f,  0.436f,
		0.327f,  0.483f,  0.844f,
		0.822f,  0.569f,  0.201f,
		0.435f,  0.602f,  0.223f,
		0.310f,  0.747f,  0.185f,
		0.597f,  0.770f,  0.761f,
		0.559f,  0.436f,  0.730f,
		0.359f,  0.583f,  0.152f,
		0.483f,  0.596f,  0.789f,
		0.559f,  0.861f,  0.639f,
		0.195f,  0.548f,  0.859f,
		0.014f,  0.184f,  0.576f,
		0.771f,  0.328f,  0.970f,

		0.583f,  0.771f,  0.014f,
		0.609f,  0.115f,  0.436f,
		0.327f,  0.483f,  0.844f,
		0.822f,  0.569f,  0.201f,
		0.435f,  0.602f,  0.223f,
		0.310f,  0.747f,  0.185f,
		0.597f,  0.770f,  0.761f,
		0.559f,  0.436f,  0.730f,
		0.359f,  0.583f,  0.152f,
		0.483f,  0.596f,  0.789f,
	0.559f,  0.861f,  0.639f,
		0.195f,  0.548f,  0.859f,
		0.014f,  0.184f,  0.576f,
		0.771f,  0.328f,  0.970f,
		0.820f,  0.883f,  0.371f,
		0.583f,  0.771f,  0.014f,
	0.609f,  0.115f,  0.436f,
	0.327f,  0.483f,  0.844f,
		0.822f,  0.569f,  0.201f,
	};

	GLuint vertexbuffer;	glGenBuffers(1, &vertexbuffer);
	glBindBuffer(GL_ARRAY_BUFFER, vertexbuffer);
	glBufferData(GL_ARRAY_BUFFER,
sizeof(g_vertex_buffer_data),
g_vertex_buffer_data, GL_STATIC_DRAW);

	GLuint colorbuffer;	glGenBuffers(1, &colorbuffer);
	glBindBuffer(GL_ARRAY_BUFFER, colorbuffer);
	glBufferData(GL_ARRAY_BUFFER,
sizeof(g_color_buffer_data),
g_color_buffer_data, GL_STATIC_DRAW);

	do{

		// Clear the screen
		glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
		// Use our shader
	glUseProgram(programID);

		// Send our transformation to the currently bound shader,
		// in the "MVP" uniform
		glUniformMatrix4fv(MatrixID, 1, GL_FALSE, &MVP[0][0]);

		// 1rst attribute buffer : vertices
		glEnableVertexAttribArray(0);
		glBindBuffer(GL_ARRAY_BUFFER, vertexbuffer);
	glVertexAttribPointer(
			0,                  // attribute. No particular reason for 0,
but must match the layout in the shader.
			3,                  // size
			GL_FLOAT,           // type
		GL_FALSE,           // normalized?
			0,                  // stride
			(void*)0            // array buffer offset
		);

		// 2nd attribute buffer : colors
	glEnableVertexAttribArray(1);
	glBindBuffer(GL_ARRAY_BUFFER, colorbuffer);
		glVertexAttribPointer(
			1,                                // attribute. No particular
reason for 1, but must match the layout in the shader.
   3,                                // size     GL_FLOAT,
// type    GL_FALSE,                         // normalized?
			0,                                // stride
			(void*)0                          // array buffer offset
		);

		// Draw the triangle !
		glDrawArrays(GL_TRIANGLES, 0, 20*3); // 12*3 indices starting at 0 ->
12 triangles

		glDisableVertexAttribArray(0);
	glDisableVertexAttribArray(1);

		// Swap buffers
	glfwSwapBuffers(window);
		glfwPollEvents();

	} // Check if the ESC key was pressed or the window was closed
	while( glfwGetKey(window, GLFW_KEY_ESCAPE ) != GLFW_PRESS &&
	   glfwWindowShouldClose(window) == 0 );

	// Cleanup VBO and shader
	glDeleteBuffers(1, &vertexbuffer);
	glDeleteBuffers(1, &colorbuffer);
	glDeleteProgram(programID);
	glDeleteVertexArrays(1, &VertexArrayID);
```

```
        // Close OpenGL window and terminate GLFW
        glfwTerminate();

        return 0;
}
```



Geogebra Icosaedro
3.201 visualizaciones • 21 abr. 2016
GeoGebra
Archivo Edita Vista Opciones Herramientas Ventana Ayuda
Vista Algebraica
Vista Gráfica
Vista Gráfica 3D
Entrada:
Tutorials (Ejecución) - Microsoft Visual Studio
Tutorial 04 - Colored Cube

Icosaedro
a = 26.54
Punto
A = (0, 0, 0)
B = (2.3, 0, 0)
C = (1.15, 1.99, 0)
D = (1.15, -1.48, 1.33)
E = (3.01, 1.74, 1.33)
F = (-0.71, 1.74, 1.33)
G = (-0.71, -0.41, 2.15)
H = (3.01, -0.41, 2.15)
I = (1.15, 2.81, 2.15)
J = (1.15, -0.66, 3.48)
K = (2.3, 1.33, 3.48)
L = (0, 1.33, 3.48)
Segmento
aristaAB = 2.3
aristaAC = 2.3
aristaAD = 2.3
aristaAF = 2.3
aristaAG = 2.3
aristaBC = 2.3
aristaBD = 2.3
aristaBE = 2.3
aristaBH = 2.3
aristaCE = 2.3
aristaCF = 2.3
aristaCI = 2.3
aristaDG = 2.3
aristaDH = 2.3
aristaDJ = 2.3
aristaEH = 2.3
aristaEI = 2.3
aristaEK = 2.3
aristaFG = 2.3

```
        // Create and compile our GLSL program from the shaders
        GLuint programID = LoadShaders("TransformVertexShader.vertexshader",
            "ColorFragmentShader.fragmentshader");
        // Get a handle for our "MVP" uniform
        GLuint MatrixID = glGetUniformLocation(programID, "MVP");
        // Projection matrix : 45° Field of View, 4:3 ratio, display range : 0.1 unit
        <-> 100 units
            glm::mat4 Projection = glm::perspective(glm::radians(45.0f), 4.0f / 3.0f,
                0.1f, 100.0f);
        // Camera matrix
        glm::mat4 View = glm::lookAt(
            glm::vec3(10, 3, -3), // Camera
            is at(4, 3, -3), in World Space
            glm::vec3(0, 0, 0), // and looks
            at the origin
            glm::vec3(0, 1, 0) // Head is
            up(set to 0, -1, 0 to look upside - down)
        );
        // Model matrix : an identity matrix (model will be at the origin)
        glm::mat4 Model = glm::mat4(1.0f);
        // Our ModelViewProjection : multiplication of our 3 matrices
        glm::mat4 MVP = Projection * View * Model; // Remember, matrix
        multiplication is the other way around
            // Our vertices. Tree consecutive floats give a 3D vertex; Three consecutive
            vertices give a triangle.
            // A cube has 6 faces with 2 triangles each, so this makes 6*2=12 triangles,
            and 12 * 3 vertices
            static const GLfloat g_vertex_buffer_data[] = {
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            2.32f,1.34f,3.51f,//K
            1.16f,-0.67f,3.51f,//J
            0.0f,1.34f,3.51f,//L
            2.32f,1.34f,3.51f,//K
            1.16f,2.04f,2.17f,//I
            0.0f,1.34f,3.51f,//L
            1.16f,-0.67f,3.51f,//J
            -0.71f,-0.41f,2.15f,//G
            0.0f,1.34f,3.51f,//L
            -0.71f,-0.41f,2.15f,//G
            -0.71f,1.74f,1.33f,//F
            0.0f,1.34f,3.51f,//L
            -0.71f,1.74f,1.33f,//F
            1.16f,2.04f,2.17f,//I
            //centro
            2.32f,1.34f,3.51f,//K
```

Toda la solución | 151 Errores | 0 Advertencias | 0 Mensajes | Compilación + IntelliSen

Códi...	Descripción	Proyecto	Archivo	Lí...
E0020	el identificador "should" no está definido	tutorial04_colored_cube	tutorial04.cpp	27
E0065	se esperaba ';'	tutorial04_colored_cube	tutorial04.cpp	27
E0008	falta la comilla de cierre	tutorial04_colored_cube	tutorial04.cpp	33
E0018	se esperaba ')'	tutorial04_colored_cube	tutorial04.cpp	34
E0007	token no reconocido	tutorial04_colored_cube	tutorial04.cpp	34