ШИНЖЛЭХ УХААН ТЕХНОЛОГИЙН ИХ СУРГУУЛЬ

Мэдээлэл, холбооны технологийн сургууль

ЛАБОРАТОРИЙН АЖЛЫН ТАЙЛАН 6

Компьютерийн график (F.CS209)

2022-2023 хичээлийн жилийн намрын улирал

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О.код: B210910019

Лаб.цаг: 2-2

Багийн дугаар:

Улаанбаатар хот

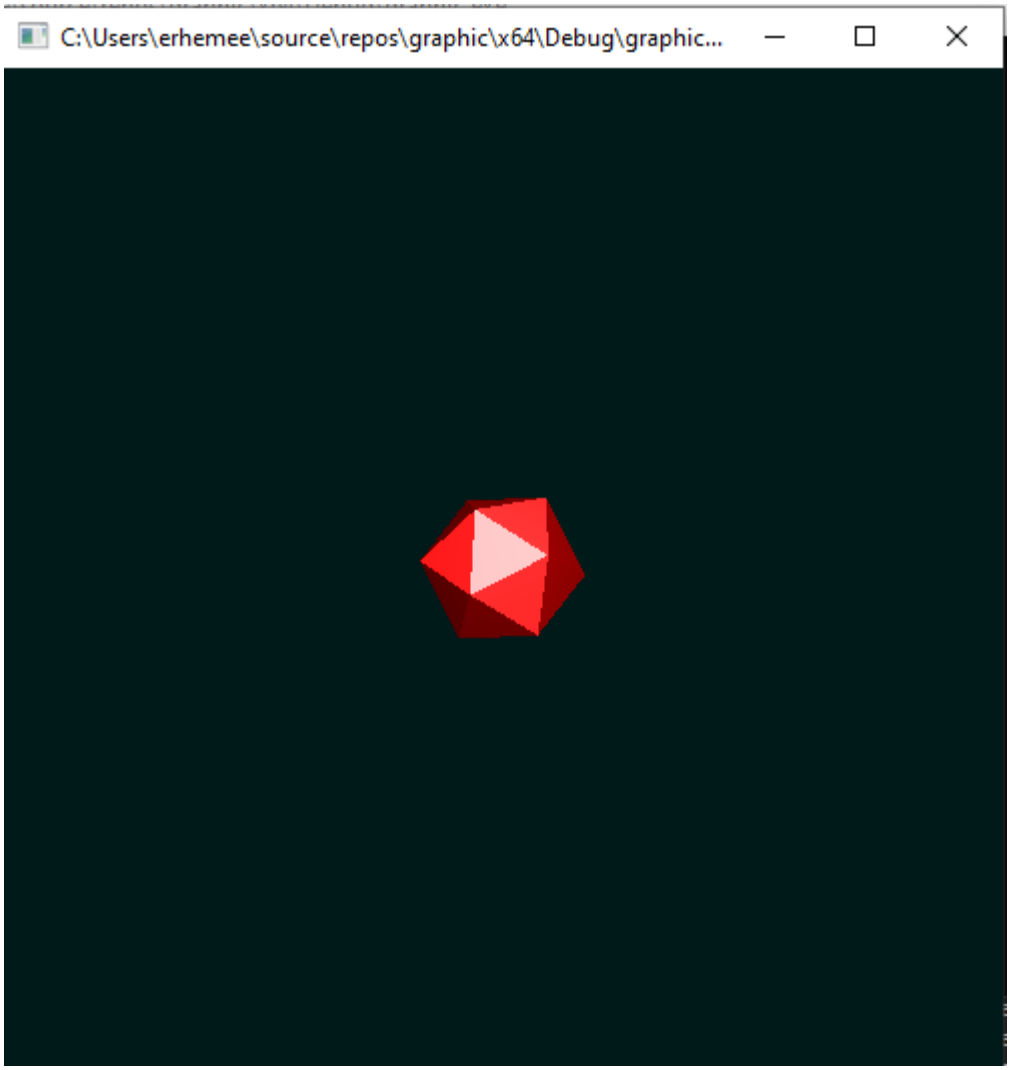
2022 он

Даалгавар:

SHADING & LIGHTING & TEXTURING

```
#include <cstdlib>
#include <GL/glut.h>
GLfloat xRotated, yRotated, zRotated;
/* z-buffer, projection matrix, light source болон lighting model Initialize
хийнэ.
* Энд материалын шинж чанарыг тодорхойлохгүй.
*/
void init(void)
{
	GLfloat ambient[] = { 0.0, 0.0, 0.0, 1.0 };
	GLfloat diffuse[] = { 1.0, 1.0, 1.0, 1.0 };
	GLfloat specular[] = { 1.0, 1.0, 1.0, 1.0 };
	GLfloat position1[] = { 0.0, 4.0, 3.0, 1.0 };
	GLfloat position2[] = { 0.0, -.0, 3.0, 1.0 };
	GLfloat lmodel_ambient[] = { 0.4, 0.4, 0.4, 1.0 };
	GLfloat local_view[] = { 0.0 };

	glClearColor(0.0, 0.1, 0.1, 0.0);
	glEnable(GL_DEPTH_TEST);
	glShadeModel(GL_SMOOTH);

	glLightfv(GL_LIGHT0, GL_AMBIENT, ambient);
	glLightfv(GL_LIGHT0, GL_DIFFUSE, diffuse);
	glLightfv(GL_LIGHT0, GL_POSITION, position1);

	glLightfv(GL_LIGHT1, GL_AMBIENT, ambient);
	glLightfv(GL_LIGHT1, GL_DIFFUSE, diffuse);
	glLightfv(GL_LIGHT1, GL_POSITION, position2);

	glLightModelfv(GL_LIGHT_MODEL_AMBIENT, lmodel_ambient);
	glLightModelfv(GL_LIGHT_MODEL_LOCAL_VIEWER, local_view);

	glEnable(GL_LIGHTING);
	glEnable(GL_LIGHT0);
	glEnable(GL_LIGHT1);
}

void display(void)
{
	glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
	glLoadIdentity();
	glTranslatef(0.0, 0.0, -5.0);
	glColor3f(0.3, 0.0, 0.0);
	glRotatef(xRotated, 1.0, 0.0, 0.0);

	glRotatef(zRotated, 0.0, 0.0, 1.0);
	glRotatef(yRotated, 0.0, 1.0, 0.0);

	GLfloat no_mat[] = { 0.0, 0.0, 0.0, 1.0 };
	GLfloat mat_ambient[] = { 0.7, 0.7, 0.7, 1.0 };
	GLfloat mat_ambient_color[] = { 0.8, 0.8, 0.2, 1.0 };
	GLfloat mat_diffuse[4] = { 0.0, 0.0, 0.0, 1.0 };
	GLfloat mat_specular[] = { 1.0, 1.0, 1.0, 1.0 };
	GLfloat no_shininess[] = { 0.0 };
	GLfloat low_shininess[] = { 5.0 };
	GLfloat high_shininess[] = { 100.0 };
	GLfloat mat_emission[] = { 0.3, 0.2, 0.2, 0.0 };
	glPushMatrix();
	glTranslatef(0, 0, 0);
	glMaterialfv(GL_FRONT, GL_AMBIENT, no_mat);
```

```
	mat_diffuse[0] = 1.0;
	mat_diffuse[1] = 0.0;
	mat_diffuse[2] = 0.0;
	glMaterialfv(GL_FRONT, GL_DIFFUSE, mat_diffuse);
	glMaterialfv(GL_FRONT, GL_SPECULAR, mat_specular);
	glMaterialfv(GL_FRONT, GL_SHININESS, low_shininess);
	glMaterialfv(GL_FRONT, GL_EMISSION, no_mat);
	glutSolidIcosahedron();
	glPopMatrix();
	glFlush();
	glutSwapBuffers();
}
void reshape(int w, int h)
{
	glViewport(0, 0, w, h);
	glMatrixMode(GL_PROJECTION);
	glLoadIdentity();
	if (w <= (h * 2))
		glOrtho(-6.0, 6.0, -3.0 * ((GLfloat)h * 2) / (GLfloat)w,
			3.0 * ((GLfloat)h * 2) / (GLfloat)w, -10.0, 10.0);
	else
		glOrtho(-6.0 * (GLfloat)w / ((GLfloat)h * 2),
			6.0 * (GLfloat)w / ((GLfloat)h * 2), -3.0, 3.0, -10.0, 10.0);
	glMatrixMode(GL_MODELVIEW);
	glLoadIdentity();
}
void keyboard(unsigned char key, int x, int y)
{
	switch (key) {
	case 27:
		exit(0);
		break;
	}
}
void idleFunc(void)
{
	yRotated += 0.01;
	xRotated += 0.01;
	zRotated += 0.01;

	display();
}
int main(int argc, char** argv)
{
	glutInit(&argc, argv);
	glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB | GLUT_DEPTH);
	glutInitWindowSize(500, 500);
	glutInitWindowPosition(100, 100);
	glutCreateWindow(argv[0]);
	glEnable(GL_DEPTH_TEST);
	xRotated = 45.0;
	zRotated = 45.0;
	yRotated = 45.0;
	init();
	glutDisplayFunc(display);
	glutReshapeFunc(reshape);
	glutIdleFunc(idleFunc);
	glutKeyboardFunc(keyboard);
	glutMainLoop();
	return 0;
}
```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