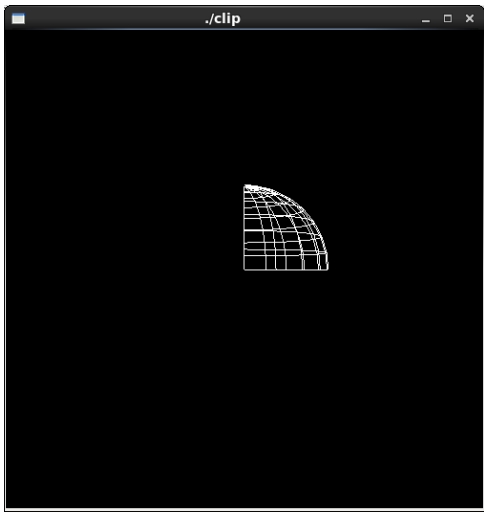
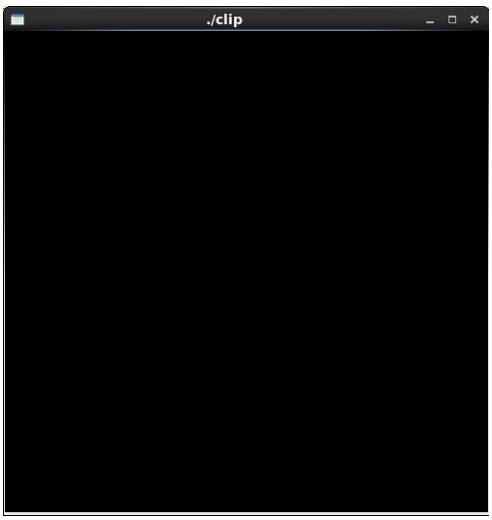
Yazhuo Liu
Lab 14

Copy the program clip.cpp from the lecture notes. Compile and execute it.



What is the use of the statement glTranslatef (0.0, 0.0, -5.0); in dispaly() function? Comment this out and recompile your program. What do you see when you run it? Why?

The statement glTranslatef() moves the object by -5z values.

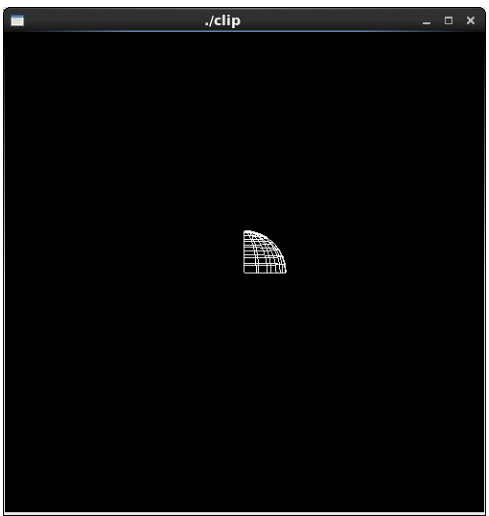


If comment out the glTranslatef(), nothing will show up. Because the object is too close to the viewpoint.

Now add the statement

gluLookAt (0, 0, 5, 0, 0, 0, 0, 1, 0);

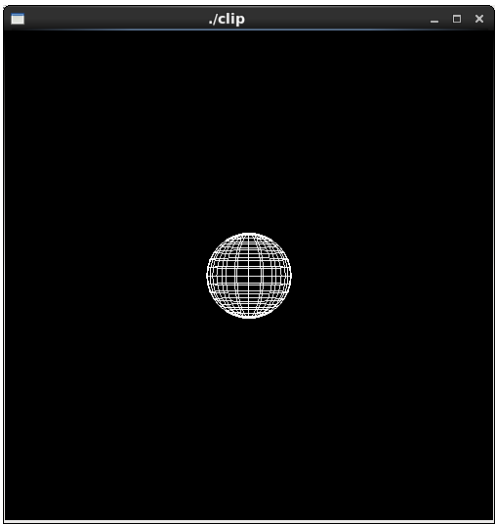
after gluPerspective() at reshape() function. What do you see? What is the effect of gluLookAt() here?



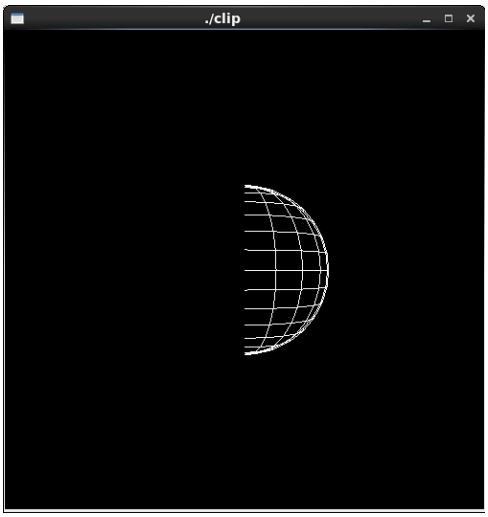
It puts the camera 5 units away from the previous viewpoint.

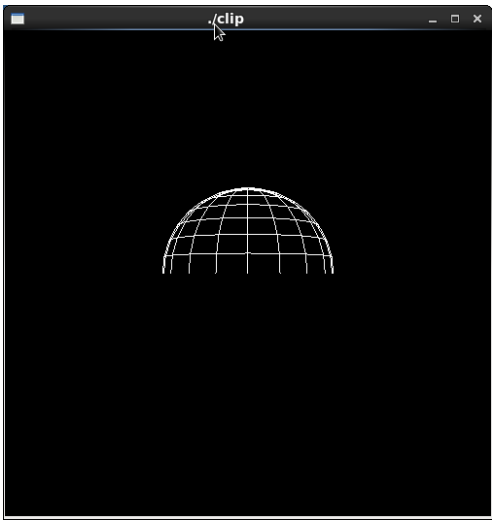
Comment out
glEnable(CL_CLIP_PLANEi);.

What do you see?

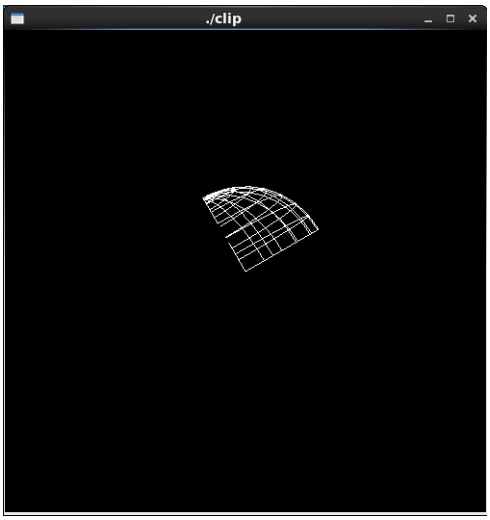


Now, restore your program and try changing the coefficients that describe the clipping planes.





Try calling a modeling transformation, such as glRotate*(), to affect glClipPlane(). Make the clipping plane move independently of the objects in the scene.



```
#include <GL/glut.h>

void init(void)
{
   glClearColor (0.0, 0.0, 0.0, 0.0);
   glShadeModel (GL_FLAT);
}

void display(void)
{
   GLdouble eqn[4] = {0.0, 1.0, 0.0, 0.0};
   GLdouble eqn2[4] = {1.0, 0.0, 0.0, 0.0};

   glClear(GL_COLOR_BUFFER_BIT);

   glColor3f (1.0, 1.0, 1.0);
   glPushMatrix();
   glTranslatef (0.0, 0.0, -5.0);
   glRotatef (30, 0, 0, 1);
/*    clip lower half -- y < 0          */
   glClipPlane (GL_CLIP_PLANE0, eqn);
   glEnable (GL_CLIP_PLANE0);
/*    clip left half -- x < 0           */
   glClipPlane (GL_CLIP_PLANE1, eqn2);
   glEnable (GL_CLIP_PLANE1);

   glRotatef (90.0, 1.0, 0.0, 0.0);        //make z-axis vertical
   /*
   poles along z-axis, 20 longitudinal slices (passing through poles)
   16 latitude cuts ( parallel to equator )
   */
   glutWireSphere(1.0, 20, 16);
   glPopMatrix();
```

```
  glFlush ();
}

void reshape (int w, int h)
{
  glViewport (0, 0, (GLsizei) w, (GLsizei) h);
  glMatrixMode (GL_PROJECTION);
  glLoadIdentity ();
  gluPerspective(60.0, (GLfloat) w/(GLfloat) h, 1.0, 20.0);
  //gluLookAt ( 0, 0, 5, 0, 0, 0, 0, 1, 0 );
  glMatrixMode (GL_MODELVIEW);
}

int main(int argc, char** argv)
{
  glutInit(&argc, argv);
  glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
  glutInitWindowSize (500, 500);
  glutInitWindowPosition (100, 100);
  glutCreateWindow (argv[0]);
  init ();
  glutDisplayFunc(display);
  glutReshapeFunc(reshape);
  glutMainLoop();
  return 0;
}
```

Report:

I completed this lab successfully.