6. To draw a simple shaded scene consisting of a tea pot on a table. Define suitably the position and properties of the light source along with the properties of the surfaces of the solid object used in the scene.

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

void wall(double thickness)
{
	//draw thin wall with top = xz-plane, corner at origin
	glPushMatrix();
	glTranslated(0.5, 0.5 * thickness, 0.5);
	glScaled(1.0, thickness, 1.0);
	glutSolidCube(1.0);
	glPopMatrix();
}

//draw one table leg
void tableLeg(double thick, double len)
{
	glPushMatrix();
	glTranslated(0, len / 2, 0);
	glScaled(thick, len, thick);
	glutSolidCube(1.0);
	glPopMatrix();
}

void table(double topWid, double topThick, double legThick, double legLen)
{
	//draw the table - a top and four legs
	//draw the top first
	glPushMatrix();
	glTranslated(0, legLen, 0);
	glScaled(topWid, topThick, topWid);
	glutSolidCube(1.0);
	glPopMatrix();

	double dist = 0.95 * topWid / 2.0 - legThick / 2.0;
	glPushMatrix();
	glTranslated(dist, 0, dist);
	tableLeg(legThick, legLen);

	glTranslated(0.0, 0.0, -2 * dist);
	tableLeg(legThick, legLen);

	glTranslated(-2 * dist, 0, 2 * dist);
	tableLeg(legThick, legLen);

	glTranslated(0, 0, -2 * dist);
	tableLeg(legThick, legLen);
	glPopMatrix();
}

void displaySolid(void)
{
	//set properties of the surface material
	GLfloat mat_ambient[] = { 0.7f, 0.7f, 0.7f, 1.0f }; // gray
	GLfloat mat_diffuse[] = { .5f, .5f, .5f, 1.0f };
	GLfloat mat_specular[] = { 1.0f, 1.0f, 1.0f, 1.0f };
	GLfloat mat_shininess[] = { 50.0f };

	glMaterialfv(GL_FRONT, GL_AMBIENT, mat_ambient);
	glMaterialfv(GL_FRONT, GL_DIFFUSE, mat_diffuse);
```

```
        glMaterialfv(GL_FRONT, GL_SPECULAR, mat_specular);
        glMaterialfv(GL_FRONT, GL_SHININESS, mat_shininess);

        //set the light source properties
        GLfloat lightIntensity[] = { 0.7f, 0.7f, 0.7f, 1.0f };
        GLfloat light_position[] = { 2.0f, 6.0f, 3.0f, 0.0f };

        glLightfv(GL_LIGHT0, GL_POSITION, light_position);
        glLightfv(GL_LIGHT0, GL_DIFFUSE, lightIntensity);

        //set the camera
        glMatrixMode(GL_PROJECTION);
        glLoadIdentity();
        double winHt = 1.0; //half-height of window
        glOrtho(-winHt * 64 / 48.0, winHt * 64 / 48.0, -winHt, winHt, 0.1, 100.0);
        glMatrixMode(GL_MODELVIEW);
        glLoadIdentity();
        gluLookAt(2.3, 1.3, 2.0, 0.0, 0.25, 0.0, 0.0, 1.0, 0.0);

        //start drawing
        glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
        glPushMatrix();
        glTranslated(0.4, 0.4, 0.6);
        glRotated(45, 0, 0, 1);
        glScaled(0.08, 0.08, 0.08);
        glPopMatrix();
        glPushMatrix();
        glTranslated(0.6, 0.38, 0.5);
        glRotated(30, 0, 1, 0);
        glutSolidTeapot(0.08);
        glPopMatrix();
        glPushMatrix();
        glTranslated(0.25, 0.42, 0.35);

        //glutSolidSphere (0.1, 15, 15);
        glPopMatrix();
        glPushMatrix();
        glTranslated(0.4, 0, 0.4);
        table(0.6, 0.02, 0.02, 0.3);

        glPopMatrix();
        wall(0.02);
        glPushMatrix();
        glRotated(90.0, 0.0, 0.0, 1.0);
        wall(0.02);

        glPopMatrix();
        glPushMatrix();
        glRotated(-90.0, 1.0, 0.0, 0.0);
        wall(0.02);
        glPopMatrix();
        glFlush();
}
void main(int argc, char** argv)
{
        glutInit(&argc, argv);
        glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB | GLUT_DEPTH);
        glutInitWindowSize(640, 480);
        glutInitWindowPosition(100, 100);
        glutCreateWindow("simple shaded scene consisting of a tea pot on a table");
        glutDisplayFunc(displaySolid);
        glEnable(GL_LIGHTING);
```

```
        glEnable(GL_LIGHT0);
        glShadeModel(GL_SMOOTH);
        glEnable(GL_DEPTH_TEST);
        glEnable(GL_NORMALIZE);
        glClearColor(0.1, 0.1, 0.1, 0.0);
        glViewport(0, 0, 640, 480);
        glutMainLoop();
}
```