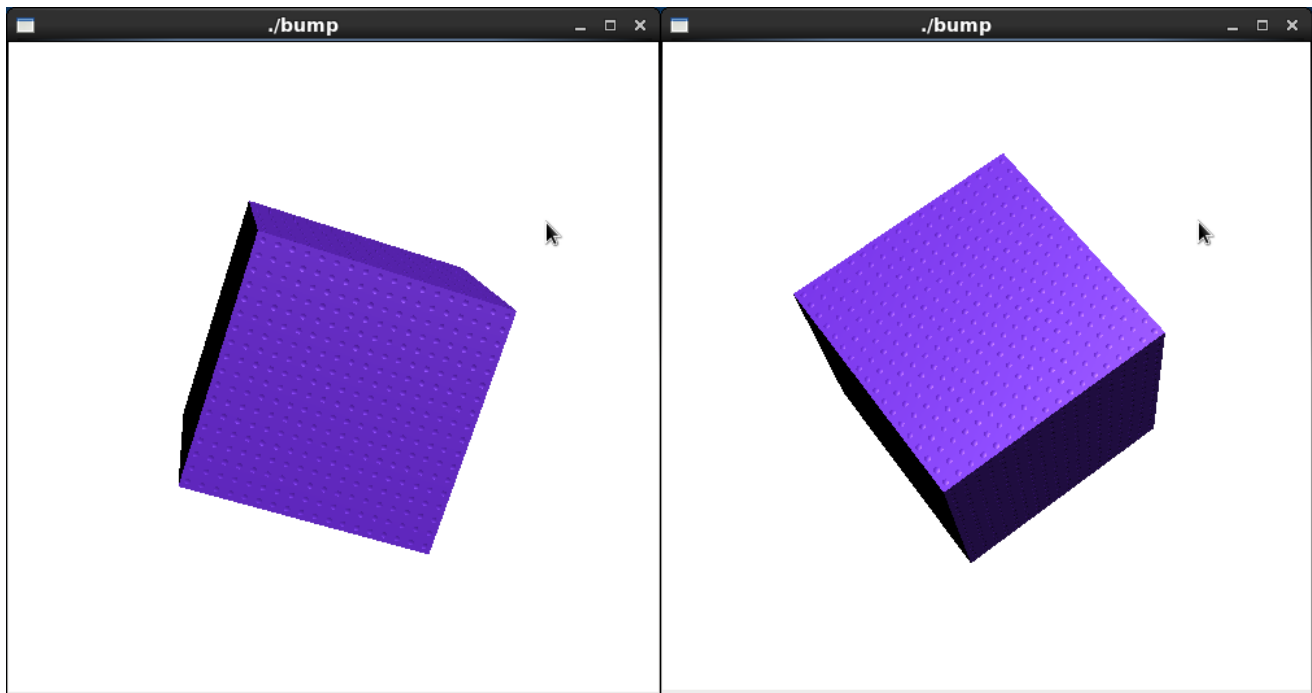Yazhuo Liu
Lab 11

Write a shader program that displays a cube with rough surface.

Code:

//bump.cpp

```
...
//source code for glutSolidCube
static void
drawBox(GLfloat size, GLenum type)
{
  static GLfloat n[6][3] =
  {
    {-1.0, 0.0, 0.0},
    {0.0, 1.0, 0.0},
    {1.0, 0.0, 0.0},
    {0.0, -1.0, 0.0},
    {0.0, 0.0, 1.0},
    {0.0, 0.0, -1.0}
  };
  static GLint faces[6][4] =
  {
    {0, 1, 2, 3},
    {3, 2, 6, 7},
    {7, 6, 5, 4},
    {4, 5, 1, 0},
```

```c
     {5, 6, 2, 1},
     {7, 4, 0, 3}
   };
   GLfloat v[8][3];
   GLint i;

   v[0][0] = v[1][0] = v[2][0] = v[3][0] = -size / 2;
   v[4][0] = v[5][0] = v[6][0] = v[7][0] = size / 2;
   v[0][1] = v[1][1] = v[4][1] = v[5][1] = -size / 2;
   v[2][1] = v[3][1] = v[6][1] = v[7][1] = size / 2;
   v[0][2] = v[3][2] = v[4][2] = v[7][2] = -size / 2;
   v[1][2] = v[2][2] = v[5][2] = v[6][2] = size / 2;

   for (i = 5; i >= 0; i--) {
     glBegin(type);
     glNormal3fv(&n[i][0]);
     glTexCoord2f (0, 0);              //add texture coordinates before each glVertex
                                       //call, similar to lab 9
     glVertex3fv(&v[faces[i][0]][0]);
     glTexCoord2f (1, 0);
     glVertex3fv(&v[faces[i][1]][0]);
     glTexCoord2f (1, 1);
     glVertex3fv(&v[faces[i][2]][0]);
     glTexCoord2f (0, 1);
     glVertex3fv(&v[faces[i][3]][0]);
     glEnd();
   }
}

void glutSolidCube(GLdouble size)
{
  drawBox(size, GL_QUADS);
}

void display(void)
{
   GLfloat vec[4];

   glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
   glClearColor( 1.0, 1.0, 1.0, 0.0 );            //get white background color

   glPushMatrix();
   glRotatef( anglex, 1.0, 0.0, 0.0);             //rotate the cube along x-axis
   glRotatef( angley, 0.0, 1.0, 0.0);             //rotate along y-axis
   glRotatef( anglez, 0.0, 0.0, 1.0);             //rotate along z-axis

   glActiveTexture(GL_TEXTURE0);
   glBindTexture(GL_TEXTURE_2D, texName);
```

```
    glutSolidCube(1);

    glPopMatrix();
    glutSwapBuffers();
    glFlush();
}
```

Report:

      I found the source code for glutSolidCube online and modified it. I added the texture coordinates before each call to glVertex3fv. However I was only able to map the bump texture to four faces of the cube, the other two faces are still black. I think the problem is that I only put 4 glTexcoord commands in the code, but I'm not sure how to solve the problem. Therefore, I'm deducting 2 points from my score.