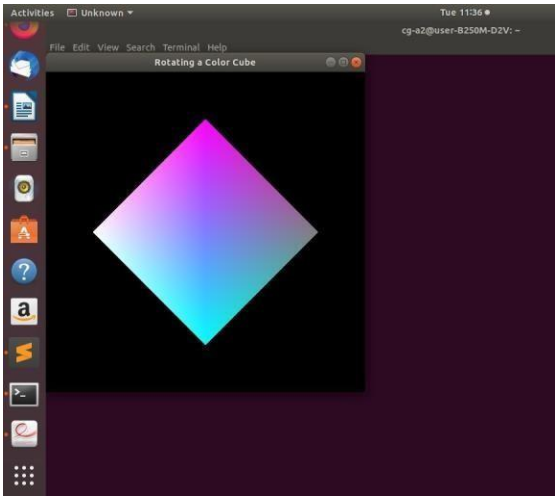
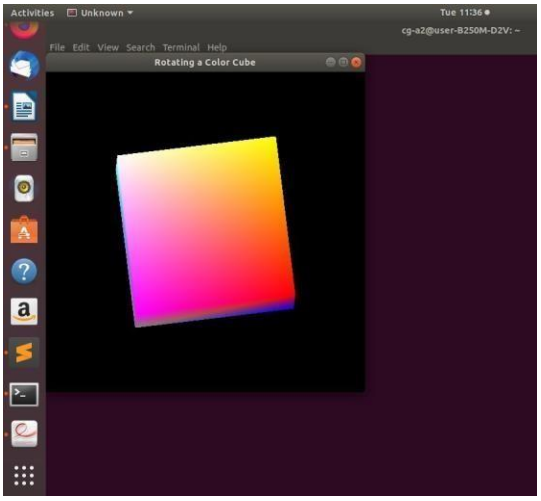
3.Program to draw a color cube and spin it using OpenGL transformation matrices.

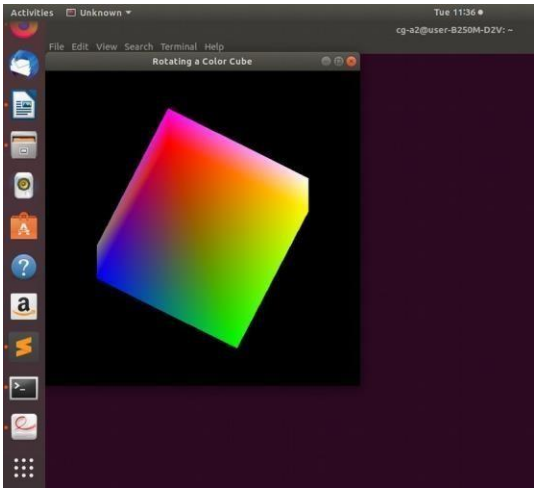
```
#include <stdlib.h>
#include <GL/glut.h>

GLfloat vertices[][3] = {{-1,-1,-1},{1,-1,-1},{1,1,-1},{-1,1,-1},{-1,-
1,1},{1,-1,1}, {1,1,1},{-1,1,1}};

GLfloat colors[][3] =
{{1,0,0},{1,1,0},{0,1,0},{0,0,1},{1,0,1},{1,1,1},{0,1,1},{0.5,0.5,0.5}
};

void polygon(int a, int b, int c , int d)
{
      glBegin(GL_POLYGON);
      glColor3fv(colors[a]);
      glVertex3fv(vertices[a]);
      glColor3fv(colors[b]);
      glVertex3fv(vertices[b]);
      glColor3fv(colors[c]);
      glVertex3fv(vertices[c]);
      glColor3fv(colors[d]);
      glVertex3fv(vertices[d]);
      glEnd();
}
void colorcube(void)
{
      polygon(0,3,2,1);
      polygon(0,4,7,3);
      polygon(5,4,0,1);
      polygon(2,3,7,6);
      polygon(1,2,6,5);
      polygon(4,5,6,7);
}
GLfloat theta[] = {0.0,0.0,0.0};
GLint axis = 2;
void display(void)
{
      glClear(GL_COLOR_BUFFER_BIT |GL_DEPTH_BUFFER_BIT);
      glLoadIdentity();
      glRotatef(theta[0], 1.0, 0.0,0.0);
      glRotatef(theta[1], 0.0, 1.0,0.0);
      glRotatef(theta[2], 0.0, 0.0,1.0);
      colorcube();
      glutSwapBuffers();
}
void spinCube()
{
      theta[axis] += 1.0;
      if( theta[axis] > 360.0 )
```

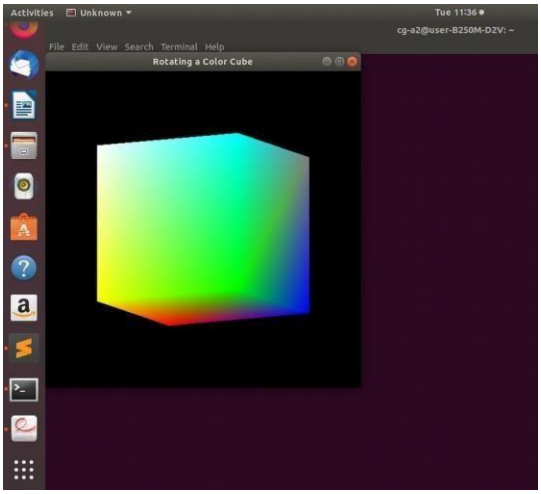
```
        theta[axis] -= 360.0;
        glutPostRedisplay();
}
void mouse(int btn, int state, int x, int y)
{
        if(btn==GLUT_LEFT_BUTTON && state == GLUT_DOWN) axis = 0;
        if(btn==GLUT_MIDDLE_BUTTON && state == GLUT_DOWN) axis = 1;
        if(btn==GLUT_RIGHT_BUTTON && state == GLUT_DOWN) axis = 2;
}
void myReshape(int w, int h)
{
        glViewport(0, 0, w, h);
        glMatrixMode(GL_PROJECTION);
        glLoadIdentity();
        if (w <= h)
        glOrtho(-2.0, 2.0, -2.0 * (GLfloat) h / (GLfloat) w,2.0 *
        (GLfloat) h / (GLfloat) w, -
        10.0, 10.0);
else
        glOrtho(-2.0 * (GLfloat) w / (GLfloat) h,2.0 * (GLfloat) w /
        (GLfloat) h, -2.0, 2.0, -
        10.0, 10.0);
        glMatrixMode(GL_MODELVIEW);
}
int main(int argc, char *argv[])
{
        glutInit(&argc, argv);
        glutInitDisplayMode(GLUT_DOUBLE | GLUT_RGB | GLUT_DEPTH);
        glutInitWindowSize(500, 500);
        glutCreateWindow("Rotating a Color Cube");
        glutReshapeFunc(myReshape);
        glutDisplayFunc(display);
        glutIdleFunc(spinCube);
        glutMouseFunc(mouse);
        glEnable(GL_DEPTH_TEST); /* Enable hidden--surface--removal */
        glutMainLoop();
}
```

OUTPUT:






Activities
Unknown
Tue 11:36
cg-a2@user-B250M-D2V: ~
File Edit View Search Terminal Help
Rotating a Color Cube


Activities
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Tue 11:36
cg-a2@user-B250M-D2V: ~
File Edit View Search Terminal Help
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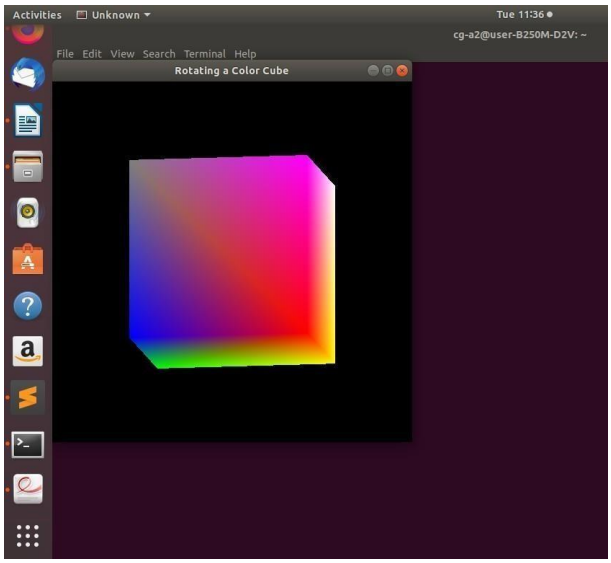
Activities
Unknown
Tue 11:36
cg-a2@user-B250M-D2V: ~
File Edit View Search Terminal Help
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