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1CR18CS152

EXPERIMENT: 06

AIM:

Draw a colour cube and allow the user to move the camera suitably to experiment with perspective viewing.

PROGRAM CODE:

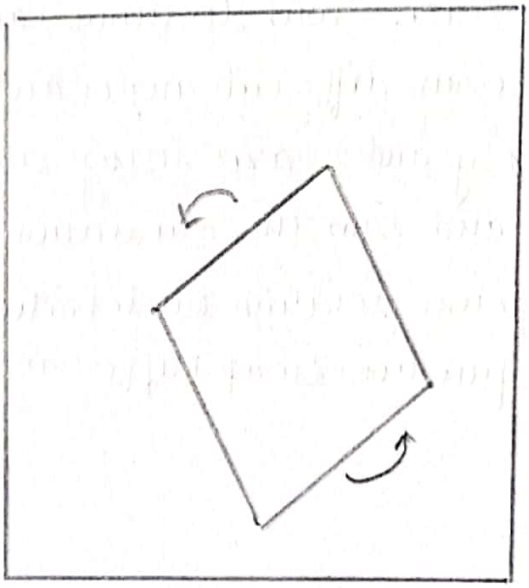
```
#include <GL/gl.h>
#include <GL/glu.h>
#include <GL/glut.h>
#include <stdlib.h>

float 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}
};
float colours[][3] = {
  {1,1,1},{0,0,0},{0,1,0},{1,1,1},{0,0,1},{1,0,1},{0,1,1},
  {1,0,0}
};
int axis=2;
float theta[] = {0,0,0};
void quad (int a, int b, int c, int d) {
  glBegin(GL_POLYGON);
    glColor3fv(colors[a]);
    glVertex3fv(vertices[a]);
```

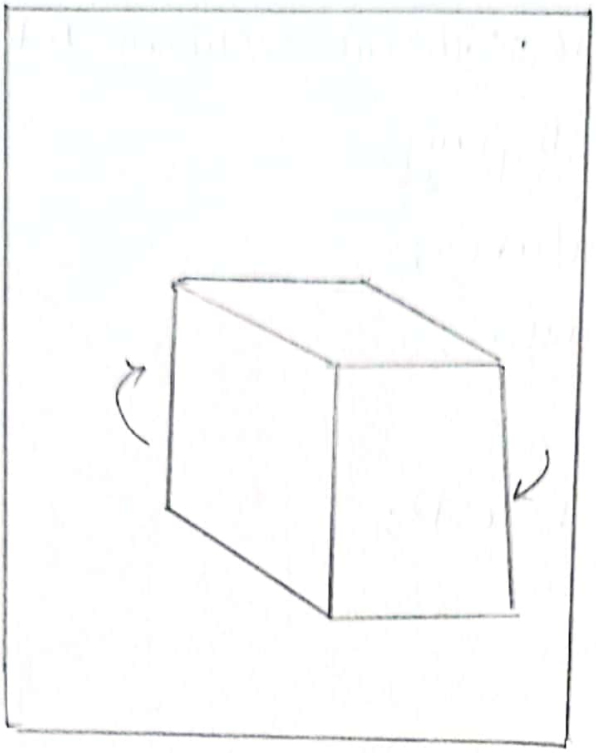
```
    glColor3fv(colors[b]);
    glVertex3f(vertices[b]);
    glColor3fv(colors[c]);
    glVertex3f(vertices[c]);
    glColor3fv(colors[d]);
    glVertex3f(vertices[d]);
  glEnd();
}
void polygon()
{
  glColor3f(1,0,0);
  quad(1,2,6,5);
  quad(0,3,2,1);
  quad(4,5,6,7);
  quad(0,4,7,3);
  quad(2,3,7,6);
  quad(0,1,5,4);
}
void display()
{
  glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);
  glLoadIdentity();
  glRotatef(theta[0],1,0,0);
  glRotatef(theta[1],0,1,0);
  glRotatef(theta[2],0,0,1);
  polygon();
  glFlush();
```

```
    glutSwapBuffers();
}
void myinit() {
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    glOrtho(-3, 3, -3, 3, -10, 10);
    glMatrixMode(GL_MODELVIEW);
}
void spinCube() {
    theta[axis] += 0.05;
    if(theta[axis] >= 360)
        theta[axis] = 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;
}
int main(int argc, char **argv) {
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_RGB | GLUT_DOUBLE | GLUT_DEPTH);
```

```
    glutInitWindowSize (500, 500);
    glutCreateWindow ("Color Cube - Shivani M.V");
    glutDisplayFunc (display);
    glutIdleFunc (spinCube);
    glutMouseFunc (mouse);
    myinit ();
    glEnable (GL_DEPTH_TEST);
    glutMainLoop ();
    return 0;
}
```

OUTPUT:





SUMMARY:

In this program we learn how to move camera i.e, present the cube in different angles and made it rotate around the x, y and z axis using simple left click and right click and saw the animation of the solid 3D cube. We also performed rotation on tetrahedron as part of viva. We used two functions swap Buffer and Glut Double.