**4.color cube perspective view**

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

GLfloat vertices[][3] = {{-1.0,-1.0,-1.0},{1.0,-1.0,-1.0}, {1.0,1.0,-1.0}, {-1.0,1.0,-1.0}, {-1.0,-1.0,1.0}, {1.0,-1.0,1.0}, {1.0,1.0,1.0}, {-1.0,1.0,1.0}};

GLfloat normals[][3] = {{-1.0,-1.0,-1.0},{1.0,-1.0,-1.0}, {1.0,1.0,-1.0}, {-1.0,1.0,-1.0}, {-1.0,-1.0,1.0}, {1.0,-1.0,1.0}, {1.0,1.0,1.0}, {-1.0,1.0,1.0}};

GLfloat colors[][3] = {{0.0,0.0,0.0},{1.0,0.0,0.0}, {1.0,1.0,0.0}, {0.0,1.0,0.0}, {0.0,0.0,1.0},

{1.0,0.0,1.0}, {1.0,1.0,1.0}, {0.0,1.0,1.0}};

**void** polygon(**int** a, **int** b, **int** c , **int** d)

{ glBegin(GL\_POLYGON); glColor3fv(colors[a]); glNormal3fv(normals[a]); glVertex3fv(vertices[a]); glColor3fv(colors[b]); glNormal3fv(normals[b]);glVertex3fv(vertices[b]

);glColor3fv(colors[c]);glNormal3fv(normals[c]);

glVertex3fv(vertices[c]); glColor3fv(colors[d]); glNormal3fv(normals[d]); glVertex3fv(vertices[d]); glEnd(); **}**  **void colorcube()**

{ polygon(0,3,2,1); polygon(2,3,7,6);

polygon(0,4,7,3); polygon(1,2,6,5);

polygon(4,5,6,7); polygon(0,1,5,4); }

**static** GLfloat theta[] = {0.0,0.0,0.0};

**static** GLint axis = 2;

**static** GLdouble viewer[]= {0.0, 0.0, 5.0};

**void display(void)**

{ glClear(GL\_COLOR\_BUFFER\_BIT | GL\_DEPTH\_BUFFER\_BIT); glLoadIdentity();

gluLookAt(viewer[0],viewer[1],viewer[2], 0.0, 0.0, 0.0, 0.0, 1.0, 0.0); 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(); glFlush(); glutSwapBuffers(); }

**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;**

theta[axis] += 2.0;

**if**( theta[axis] > 360.0 ) theta[axis] -= 360.0; display(); }

**void** keys(**unsigned char** key, **int** x, **int** y)

{ **if**(key == 'x') viewer[0]-= 1.0;

**if**(key == 'X') viewer[0]+= 1.0;

**if**(key == 'y') viewer[1]-= 1.0;

**if**(key == 'Y') viewer[1]+= 1.0;

**if**(key == 'z') viewer[2]-= 1.0;

**if**(key == 'Z') viewer[2]+= 1.0; display(); }

**void** myReshape(**int** w, **int** h)

{ glViewport(0, 0, w, h);

glMatrixMode(GL\_PROJECTION);

glLoadIdentity();

**if(w<=h)**

glFrustum(-2.0, 2.0, -2.0\*(GLfloat) h/(GLfloat) w,2.0\* (GLfloat) h / (GLfloat) w,2.0, 20.0);

else

glFrustum(-2.0, 2.0, -2.0\*(GLfloat) w/(GLfloat) h,2.0\* (GLfloat) w/(GLfloat) h, 2.0, 20.0);

glMatrixMode(GL\_MODELVIEW); }

void main(int argc, char \*\*argv) { glutInit(&argc, argv);

glutInitDisplayMode(GLUT\_DOUBLE |

GLUT\_RGB|GLUT\_DEPTH);glutInitWindowSize(500, 500);glutCreateWindow("Colorcube Viewer");

glutReshapeFunc(myReshape);glutDisplayFunc(display);glutMouseFunc(mouse);glutKeyboardFunc(keys);glEnable(GL\_DEPTH\_TEST); glutMainLoop(); }