SCHOOL OF COMPUTER SCIENCE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
DEHRADUN, UTTARAKHAND

COMPUTER GRAPHICS
LABORATORY FILE
(2024-2025)

For
Vth Semester

Submitted To:
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LAB EXPERIMENT – 9

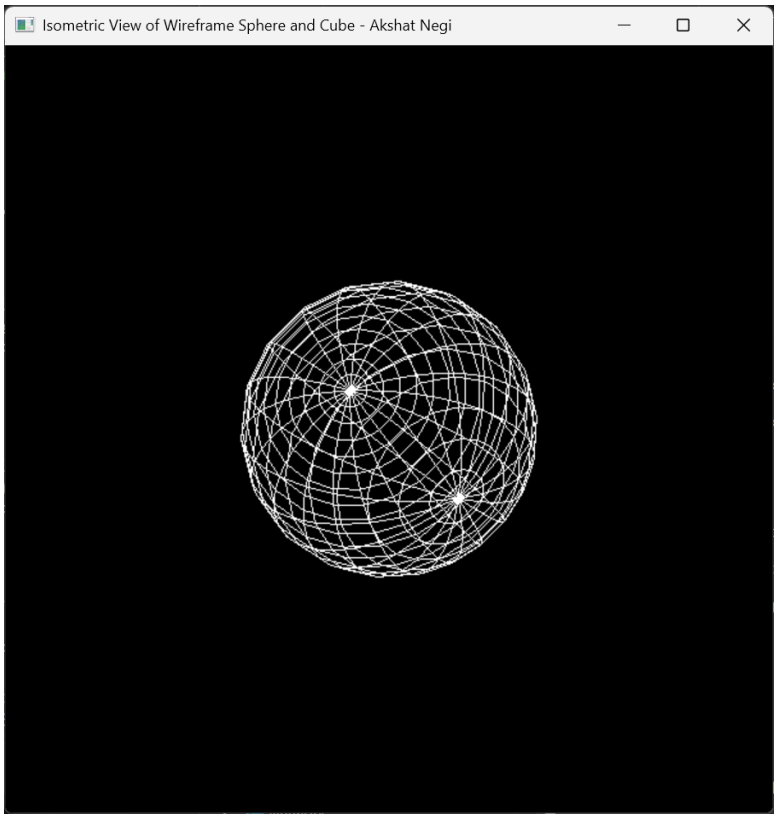
Creating 3D Shapes like Cube, Sphere and others.

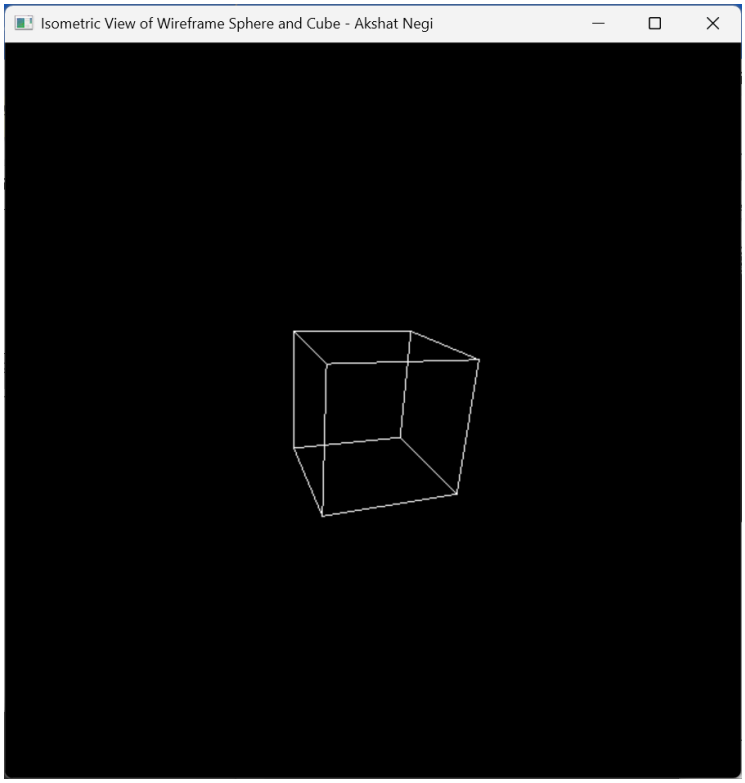
Creating 3D Shapes like Cube, Sphere and others.

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

bool showSphere = true; // Toggle between sphere and cube

// Function to draw a wireframe sphere
void drawWireframeSphere() {
    glColor3f(1.0f, 1.0f, 1.0f); // Set color to white
    glLineWidth(0.5f);            // Ensure thin lines
    glutWireSphere(1.0, 20, 20);  // Draw a wireframe sphere with radius 1 and
resolution of 20 slices and stacks
}

// Function to draw a wireframe cube
void drawWireframeCube() {
    glColor3f(1.0f, 1.0f, 1.0f); // Set color to white
    glutWireCube(1.0);           // Draw a wireframe cube with side length 1
}

// Display function to render the isometric view of the chosen object
void display() {
    glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);  // Clear color and depth
buffers

    // Set up the isometric view
    glMatrixMode(GL_MODELVIEW);
    glLoadIdentity();
    glTranslatef(0.0f, 0.0f, -3.0f);  // Position object further from the camera
    glRotatef(30, 1.0f, 1.0f, 0.0f);  // Rotate for isometric effect

    if (showSphere) {
        drawWireframeSphere();        // Draw the sphere
    }
    else {
        drawWireframeCube();          // Draw the cube
    }

    glutSwapBuffers();  // Swap buffers for double buffering
}

// Initialize OpenGL settings
void init() {
    glEnable(GL_DEPTH_TEST);             // Enable depth testing
    glClearColor(0.0f, 0.0f, 0.0f, 1.0f); // Set background to black

    // Set up projection
    glMatrixMode(GL_PROJECTION);
    gluPerspective(85.0, 1.0, 1.0, 100.0); // Perspective projection for depth
}
```

```
// Keyboard function to toggle between sphere and cube
void keyboard(unsigned char key, int x, int y) {
    if (key == 't') {
        showSphere = !showSphere; // Toggle object
        glutPostRedisplay();      // Request display update
    }
}

int main(int argc, char** argv) {
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_DOUBLE | GLUT_RGB | GLUT_DEPTH); // Double buffering
and depth
    glutInitWindowSize(600, 600);                              // Set window size
    glutCreateWindow("Isometric View of Wireframe Sphere and Cube - Akshat
Negi"); // Window title

    init();                     // Initialize OpenGL state
    glutDisplayFunc(display);  // Register display callback function
    glutKeyboardFunc(keyboard); // Register keyboard callback function

    glutMainLoop();
    return 0;
}
```

This program should display either the sphere or cube in an isometric view, allowing you to switch between them by pressing 't'.




Isometric View of Wireframe Sphere and Cube - Akshat Negi