

**Lab Sheet No : 04**

**Index No : 19APP3936**

**Name : W.H.S.N.Rathnaweera**

**Date : 03.02.2025**

**Q1.**

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

```
#include <stdio.h>
```

```
int currentObject = 0;
```

```
float objRotX = 0.0, objRotY = 0.0;
```

```
float lightAngleX = 0.0;
```

```
GLfloat light_position[] = {0.0, 0.0, 1.0, 0.0};
```

```
GLfloat white_light[] = {1.0, 1.0, 1.0, 1.0};
```

```
void display() {
```

```
    glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
```

```
    glMatrixMode(GL_MODELVIEW);
```

```
    glLoadIdentity();
```

```
    glPushMatrix();
```

```
    glRotatef(lightAngleX, 1.0, 0.0, 0.0);
```

```
    glLightfv(GL_LIGHT0, GL_POSITION, light_position);
```

```
    glPopMatrix();
```

```
    glRotatef(objRotX, 1.0, 0.0, 0.0);
```

```
    glRotatef(objRotY, 0.0, 1.0, 0.0);
```

```
    switch (currentObject) {
```

```
        case 0: glutSolidTorus(0.2, 0.6, 30, 30); break;
```

```
        case 1: glutSolidTeapot(0.5); break;
```

```
        case 2: glutSolidSphere(0.5, 30, 30); break;
```

```
        case 3: glutSolidCube(0.6); break;
```

```
    }
```

```
    glutSwapBuffers();
```

```
}
```

```

void specialKeys(int key, int x, int y) {
    if (key == GLUT_KEY_LEFT) objRotY -= 5;
    if (key == GLUT_KEY_RIGHT) objRotY += 5;
    if (key == GLUT_KEY_UP) objRotX -= 5;
    if (key == GLUT_KEY_DOWN) objRotX += 5;

    glutPostRedisplay();
}

void timer(int value) {
    lightAngleX += 1.0;
    if (lightAngleX >= 360) lightAngleX -= 360;

    glutPostRedisplay();
    glutTimerFunc(16, timer, 0);
}

void objectMenu(int value) {
    currentObject = value;
    glutPostRedisplay();
}

void init() {
    glEnable(GL_LIGHTING);
    glEnable(GL_LIGHT0);
    glEnable(GL_DEPTH_TEST);

    glLightfv(GL_LIGHT0, GL_DIFFUSE, white_light);
    glLightfv(GL_LIGHT0, GL_SPECULAR, white_light);

    glClearColor(0.0, 0.0, 0.0, 1.0);
}

int main(int argc, char** argv) {
    glutInit(&argc, argv);
    glutInitWindowSize(800, 600);
    glutInitDisplayMode(GLUT_DOUBLE | GLUT_RGB | GLUT_DEPTH);
    glutCreateWindow("OpenGL Exercise 04");
    init();

    glutDisplayFunc(display);
    glutSpecialFunc(specialKeys);
}

```

```
glutTimerFunc(0, timer, 0);
```

```
int object_menu = glutCreateMenu(objectMenu);
```

```
glutAddMenuEntry("Torus", 0);
```

```
glutAddMenuEntry("Teapot", 1);
```

```
glutAddMenuEntry("Sphere", 2);
```

```
glutAddMenuEntry("Cube", 3);
```

```
glutAttachMenu(GLUT_RIGHT_BUTTON);
```

```
glutMainLoop();
```

```
return 0;
```

```
}
```



