

Programs on Transformations

/ Translation transformation to move an object along x-axis */*

```
#include<GL/glut.h>
void display()
{
    glClear(GL_COLOR_BUFFER_BIT);
    glBegin(GL_QUADS);
        glVertex2f(1.0,1.0);
        glVertex2f(3.0,1.0);
        glVertex2f(3.0,4.0);
        glVertex2f(1.0,4.0);
    glEnd();
    glFlush();
}
void init()
{
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(0.0,12,0.0,7);
}
void timer(int n)
{
    glMatrixMode(GL_MODELVIEW);
    glLoadIdentity();
    glTranslatef(5.0,0.0,0.0);
    glutPostRedisplay();
    glutTimerFunc(1000,timer,n); // to have some delay
}
int main(int argc,char** argv)
{
    glutInit(&argc,argv);
    glutInitDisplayMode(GLUT_SINGLE);
    glutInitWindowPosition(200,200);
    glutInitWindowSize(300,300);
    glutCreateWindow("Translation");
    init();
    glutDisplayFunc(display);
    glutTimerFunc(1000,timer,10); // callback to timer function
    glutMainLoop();
}
```

/ Rotation transformation to rotate an object about z-axis wrt to origin */*

```
#include<GL/glut.h>
void polygon()
{
    glBegin(GL_POLYGON);
    glColor3f(0.0,0.0,0.0);
    glVertex2f(1.0,1.0);
    glVertex2f(4.0,1.0);
    glVertex2f(4.0,4.0);
    glVertex2f(1.0,4.0);
    glEnd();
}
void display()
{
    glClearColor(1.0f,1.0f,1.0f,1.0f);
    glClear(GL_COLOR_BUFFER_BIT);
    polygon();
    glFlush();
}
void timer(int n)
{
    glMatrixMode(GL_MODELVIEW);
    glLoadIdentity();
    //glTranslatef(2.0,2.0,0.0);
    glRotatef(45.0,0.0,0.0,1.0);
    //glTranslatef(-2.0,-2.0,0.0);
    polygon();
    glutPostRedisplay();
    glutTimerFunc(1000,timer,n);
}
void init()
{
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(-6,6,-6,6);
}
int main(int argc, char **argv)
{
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_SINGLE);
    glutInitWindowPosition(100,100);
    glutInitWindowSize(300,300);
    glutCreateWindow("Rotation");
    init();
    glutDisplayFunc(display);
    glutTimerFunc(1000,timer,10);
    glutMainLoop();
}
```

/ Scaling transformation */*

```
#include<GL/glut.h>
void display()
{
    glClearColor(1.0f,1.0f,1.0f,1.0f);
    glClear(GL_COLOR_BUFFER_BIT);
    glBegin(GL_POLYGON);
    glColor3f(0.0,0.0,0.0);
    glVertex2f(1.0,1.0);
    glVertex2f(4.0,1.0);
    glVertex2f(4.0,4.0);
    glVertex2f(1.0,4.0);
    glEnd();
    glFlush();
}
void timer(int n)
{
    glMatrixMode(GL_MODELVIEW);
    glLoadIdentity();
    glScalef(0.5,0.5,0.5);
    glutPostRedisplay();
    glutTimerFunc(1000,timer,n);
}
void init()
{
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(-6,6,-6,6);
}
int main(int argc, char **argv)
{
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_SINGLE);
    glutInitWindowPosition(100,100);
    glutInitWindowSize(300,300);
    glutCreateWindow("Scaling");
    init();
    glutDisplayFunc(display);
    glutTimerFunc(1000,timer,10);
    glutMainLoop();
}
```