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# 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();
}
```

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***/* Rotation transformation to roatate 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();
}
```

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***/* Scaling tranformation */***

```
#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();
}
```

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