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Cse-B

Lab Test

2) Draw a spinning top and apply 2-D transformations to simulate the rotating motion.

Code:

```
#include <iostream>
#include<GLUT/glut.h>
#include<cmath>
void myInit(){
   glClearColor(1, 1, 1, 1);
   glColor3f(0, 0, 0);
   glPointSize(6);
   glMatrixMode(GL_PROJECTION);
   glLoadIdentity();
   gluOrtho2D(-320, 320, -240, 240);
}
int hom[3][5];
double res[3][5];
void rotater(){
   double rot[3][3]={{cos(0.5),-sin(0.5),0},{sin(0.5),cos(0.5),0},{0,0,1}};
   for(int i=0;i<3;i++){
      for(int j=0;j<5;j++){
         for(int k=0;k<3;k++){
            res[i][j]+=rot[i][k]*hom[k][j];
         }
      }
   }
   for(int i=0;i<3;i++){
      for(int j=0;j<5;j++)
         hom[i][j]=res[i][j];
   }
}
void rotation(int s){
   for(int i=0;i<3;i++){
      for(int j=0;j<5;j++)
         res[i][j]=0;
   }

   glBegin(GL_LINE_LOOP);
   glVertex2i(hom[0][0], hom[1][0]);
   glVertex2i(hom[0][1], hom[1][1]);
   glVertex2i(hom[0][3], hom[1][3]);
   glEnd();
   glBegin(GL_LINES);
   glVertex2i(hom[0][2], hom[1][2]);
   glVertex2i(hom[0][4], hom[1][4]);
   glEnd();
   glFlush();

   rotater();
   for(int i=0;i<5;i++)
      hom[0][i]+=50;
   glutTimerFunc(1000, rotation, 0);

}
void myDisplay(){
   glClear(GL_COLOR_BUFFER_BIT);
   int fhom[3][5]={{0,-100,0,100,0},{-100,0,0,0,100},{1,1,1,1,1}};
   for(int i=0;i<3;i++){
      for(int j=0;j<5;j++)
         hom[i][j]=fhom[i][j];
   }
   rotation(0);

}
int main(int argc,char * argv[]) {

   glutInit(&argc, argv);
   glutInitDisplayMode(GLUT_SINGLE | GLUT_RGB);
   glutInitWindowSize(640, 480);
   glutCreateWindow("Test");
   myInit();
   glutDisplayFunc(myDisplay);
   glutMainLoop();
   return 0;
}
```

Output: