COMPUTER GRAPHICS

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PROBLEM STATEMENT :

Write a java program to implement shear, rotation, and scaling.

CODE :

package cgg\_final;

import java.awt.Graphics;

import java.util.Scanner;

import javax.swing.JFrame;

public class Assignment12\_Rhombus extends JFrame

{

int tx,ty,sx,sy;

int sum=0;

int vertex[][]={{300,400,200,300},{100,100,200,200},{1,1,1,1}},transm[][]=new int[3][3],res[][]=new int[3][4];

//double sum=0.0;

//double transm[][]=new double[3][3],res[][]=new double[3][4],vertex[][]={{300,400,200,300},{100,100,200,200},{1,1,1,1}};

Scanner in=new Scanner(System.in);

public void setMatrix\_Translation()

{

System.out.println("Enter Translating Factor ");

System.out.print("Enter tx : ");

tx=in.nextInt();

System.out.print("Enter ty : ");

ty=in.nextInt();

transm[0][0]=1;transm[1][1]=1;transm[2][2]=1;transm[0][2]=tx;transm[1][2]=ty;

}

public void setMatrix\_Scaling()

{

System.out.println("Enter Scaling Factor ");

System.out.print("Enter Sx : ");

sx=in.nextInt();

System.out.print("Enter Sy : ");

sy=in.nextInt();

transm[0][0]=sx;transm[1][1]=sy;transm[2][2]=1;

}

public void setMatrix\_Rotation()

{

//Rotation by 30 degree

//transm[0][0]=0.8660;transm[0][1]=-0.5;transm[1][0]=0.5;transm[1][1]=0.8660;transm[2][2]=1;

}

public void setMatrix\_shearX()

{

double Sx;

System.out.println("Enter Shearing Factor in X : ");

Sx=in.nextDouble();

//transm[0][0]=transm[1][1]=transm[2][2]=1;transm[0][1]=Sx;

}

public void setMatrix\_shearY()

{

double Sy;

System.out.println("Enter Shearing Factor in Y : ");

Sy=in.nextDouble();

//transm[0][0]=transm[1][1]=transm[2][2]=1;transm[1][0]=Sy;

}

public void Multi()

{

for(int i=0;i<3;i++)

{

for(int j=0;j<4;j++)

{

sum=0;

for(int k=0;k<3;k++)

{

sum=sum+transm[i][k]\*vertex[k][j];

}

res[i][j]=sum;

}

}

}

public void paint(Graphics g)

{

//Before Transformation Rhombus

g.drawLine(300,100,400,100);

g.drawLine(300,100,200,200);

g.drawLine(200,200,300,200);

g.drawLine(400,100,300,200);

//After Transformation Rhombus

g.drawLine((int)res[0][0],(int)res[1][0],(int)res[0][1],(int)res[1][1]);

g.drawLine((int)res[0][1],(int)res[1][1],(int)res[0][3],(int)res[1][3]);

g.drawLine((int)res[0][2],(int)res[1][2],(int)res[0][0],(int)res[1][0]);

g.drawLine((int)res[0][3],(int)res[1][3],(int)res[0][2],(int)res[1][2]);

}

public static void main(String[] args)

{

Assignment12\_Rhombus obj=new Assignment12\_Rhombus();

//obj.setMatrix\_Translation();

obj.setMatrix\_Scaling();

//obj.setMatrix\_Rotation();

//obj.setMatrix\_shearX();

//obj.setMatrix\_shearY();

obj.Multi();

obj.setSize(900,900);

obj.setTitle("Translation");

obj.setVisible(true);

obj.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

}

}

OUTPUT :

