**Assignment number: 4**

**Subject: COMPUTER GRAPHICS LAB**

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Division: ***B***

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**PROBLEM STATEMENT:**

Write a Java program for line drawing using DDA or Bresenhams algorithm with patterns (line styles) such as solid, dotted, dashed, dash dot and thick.

**Code:**

package lines;

import java.awt.\*;

import static java.lang.Math.abs;

import javax.swing.JFrame;

import static java.lang.Math.round;

import java.util.Scanner;

public class Lines extends JFrame{

Scanner sc=new Scanner(System.in);

public void dda(Graphics g,int x1,int y1,int x2,int y2)

{

float X,Y,dx,dy,x,y,span;

x=x2-x1;

y=y2-y1;

if ( Math.abs(x) >= Math.abs(y))

span = Math.abs(x);

else

span =Math.abs(y);

dx=x/span;

dy=y/span;

X=x1;

Y=y1;

for(int i=1;i<=span;i++)

{

g.fillOval(round(X), round(Y), 1, 1);

X=X+dx;

Y=Y+dy;

}

}

public void dot(Graphics g,int x1,int y1,int x2,int y2)

{ int temp,temp1;

float dx,dy,m;

if(x1>x2)

{

temp=x1;

x1=x2;

x2=temp;

temp1=y1;

y1=y2;

y2=temp1;

}

dx=x2-x1;

dy=y2-y1;

m=dy/dx;

if(dx>dy)

{

while(x1<=x2)

{

g.fillOval(round(x1),round(y1),1,1);

x1=x1+5;

y1=y1+round(m);

}

}

else

{

while(y1<=y2)

{

g.fillOval(round(x1),round (y1), 1, 1);

y1=y1+5;

x1=(x1+round(1/m));

}

}

}

public void dashdot(Graphics g,int x1,int x2,int y1,int y2)

{

float dx,dy,len,xi,yi;

float x,y;

int i;

dx=Math.abs(x2-x1);

dy=Math.abs(y2-y1);

if(dx>=dy)

len=dx;

else

len=dy;

dx=(x2-x1)/len;

dy=(y2-y1)/len;

x=(float) (x1 + 0.5);

y=(float) (y1 + 0.5);

g.fillOval(round(x1),round(y1) , 3, 3);

g.fillOval(round(x2),round(y2) , 3, 3);

for(i=0;i<=len;i++)

{

if(i%9<2)

{

}

else if(i%9<6)

g.fillOval(round(x), round(y), 3, 3);

else if(i%9==7)

{

}

else

g.fillOval(round(x), round(y), 3, 3);

x+=dx;

y+=dy;

}

}

public void dash(Graphics g,int x1,int y1,int x2,int y2)

{

int dx,dy,xend,p,x,y,cnt=0;

float m;

dx=Math.abs(x2-x1);

dy=Math.abs(y2-y1);

p=2\*dy-dx;

if(abs(dx)>abs(dy))

xend=abs(dx);

else

xend=abs(dy);

m=dy/(float)dx;

if(x2>x1)

{

x=x1;

y=y1;

}

else

{

x=x2;

y=y2;

}

g.fillOval(round(x),round (y), 1, 1);

while(x<xend)

{

x=x+1;

if((cnt/5)%2==0)

g.fillOval(x, y, 2, 2);

if(p<0)

{

p=p+2\*dy;

}

else

{

if(m>=0&&m<=1)

y=y+1;

else

{

if(dx==0)

x--;y--;

}

p=p+2\*(dy-dx);

}

cnt++;

}

}

public void thick(Graphics g,int x1,int y1,int x2,int y2,int thick)

{

int temp1,temp2,dx,dy;

float m;

if(x1>x2)

{

temp1=x1;

x1=x2;

x2=temp1;

temp2=y1;

y1=y2;

y2=temp2;

}

dx=x2-x1;

dy=y2-y1;

m=dy/dx;

if(dx>dy)

{

while(x1<=x2)

{

g.fillOval(x1, y1,1,1 );

x1=x1+1;

y1=(int) (y1+m);

}

}

else

{

while(y1<=y2)

{

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

{

g.fillOval(x1+j, y1,1, 1);

}

y1=y1+1;

x1=(int) (x1+(1/m));

}

}

}

public void paint(Graphics g)

{

dda(g,50,50,200,50);

dash(g,50,100,200,100);

dot(g,50,150,200,150);

dashdot(g,50,200,200,200);

thick(g,500,250,200,250,5);

}

public static void main(String[] args) {

// TODO code application logic here

Lines l=new Lines();

//Scanner in=new Scanner(System.in);

l.setSize(500,500);

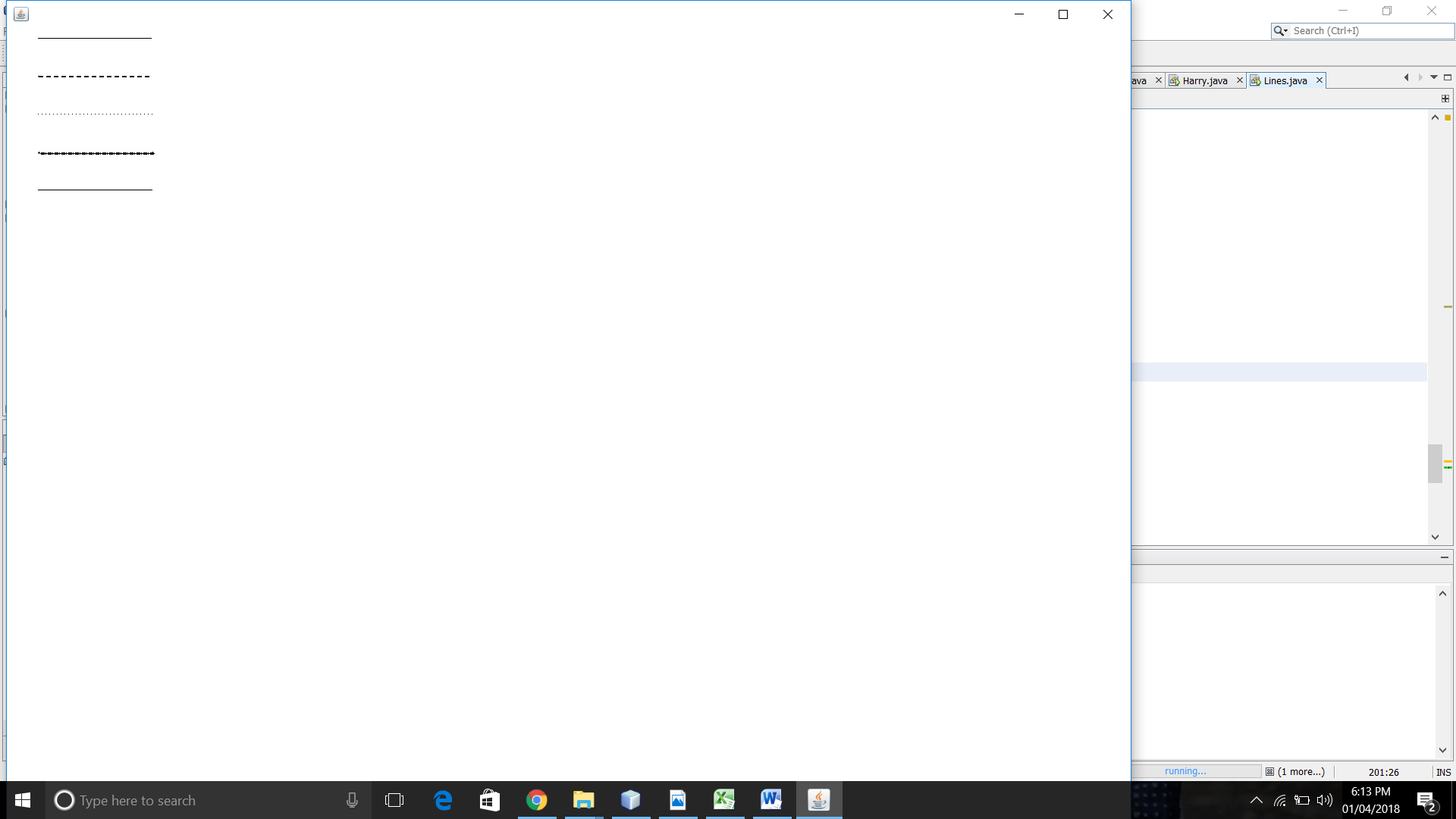
l.setVisible(true);

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

}

}

**OUTPUT:**

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