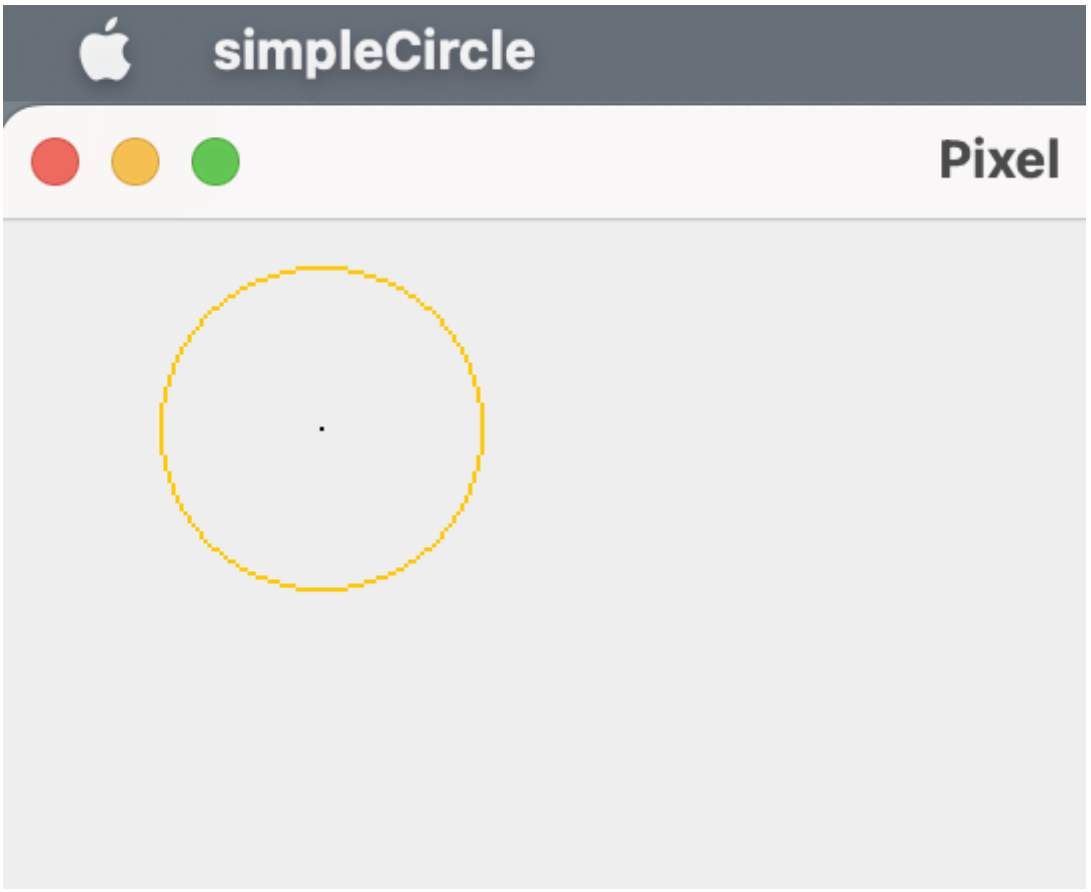
2111O134 - ALONDRA YAZMIN URZUA CASILLAS
6°P T/M GRÁFICAS 2D Y 3D 13 sept 2023

PRÁCTICAS RESTANTES DE ENTREGAR:

CÍRCULO SIMPLE

```
package PARCIALI;

import java.awt.Color;

public class simpleCircle {
private PARCIALI.pixel pixel;

public simpleCircle() {
pixel = new PARCIALI.pixel();
}

public void drawCircle(int xc, int yc, int radio) {
for (int x = -radio; x <= radio; x++) {
int y = (int) Math.round(Math.sqrt(radio * radio - x * x));
//son ocho cuadrantes para que salga completo
pixel.putPixel(xc + x, yc + y, Color.ORANGE);
pixel.putPixel(xc - x, yc + y, Color.ORANGE);
pixel.putPixel(xc + x, yc - y, Color.ORANGE);
pixel.putPixel(xc - x, yc - y, Color.ORANGE);
pixel.putPixel(xc + y, yc + x, Color.ORANGE);
pixel.putPixel(xc - y, yc + x, Color.ORANGE);
pixel.putPixel(xc + y, yc - x, Color.ORANGE);
pixel.putPixel(xc - y, yc - x, Color.ORANGE);
//pinta las coordenanas del centro
pixel.putPixel(xc, yc, Color.BLACK);

}
}

public static void main(String[] args) {
simpleCircle drawer = new simpleCircle();

//int centerX = 80;
//int centerY = 80;
//int radius = 40;


int centerX ;
int centerY ;
int radius ;

//drawer.drawCircle(centerX, centerY, radius);
drawer.drawCircle(80, 80, 40);
}
```

```
}
```



CIRCULO POLAR:

```
package PARCIALI;

import java.awt.Color;

public class PolarCoordinatesCircle {
private PARCIALI.pixel pixel;

public PolarCoordinatesCircle() {
pixel = new PARCIALI.pixel();
}

public void drawCircle(int xc, int yc, int radius) {
//Ciclo for que recorre seún los pasos establecidos
for (int angulo = 0; angulo < 360; angulo++) {
double radians = Math.toRadians(angulo);
int x = (int) (radius * Math.cos(radians));
int y = (int) (radius * Math.sin(radians));

pixel.putPixel(xc + x, yc + y, Color.magenta);
pixel.putPixel(xc - x, yc + y, Color.magenta);
```

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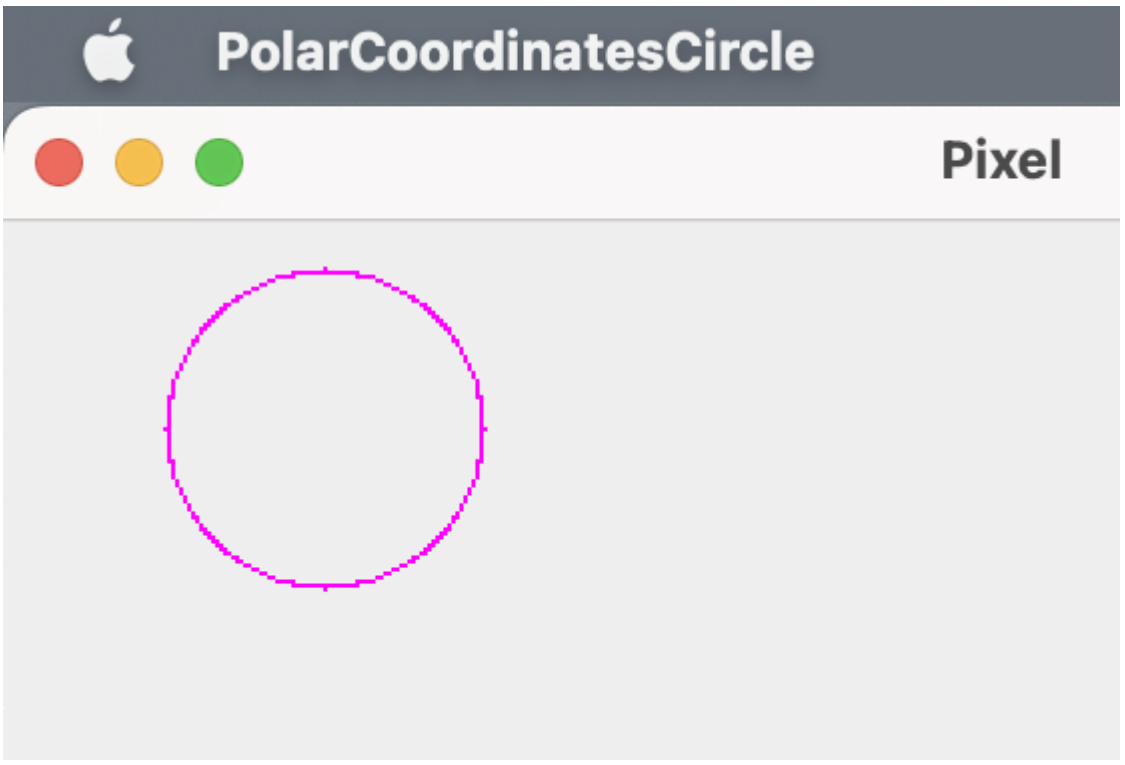
```
pixel.putPixel(xc + x, yc - y, Color.magenta);
pixel.putPixel(xc - x, yc - y, Color.magenta);
}

// Pinta las coordenadas del centro
pixel.putPixel(xc, yc, Color.BLACK);
}

public static void main(String[] args) {
PolarCoordinatesCircle drawer = new PolarCoordinatesCircle();

int centerX = 80;
int centerY = 80;
int radius = 40;

drawer.drawCircle(centerX, centerY, radius);
}
}
```



CIRCULO PUNTO MEDIO:

```
package PARCIALI;

import java.awt.Color;

public class middleCircle {
```

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```
private PARCIALI.pixel pixel; // Instancia de la clase Pixel

public middleCircle() {
pixel = new PARCIALI.pixel(); // Crear una instancia de la clase Pixel
}

public void drawCircle(int centerX, int centerY, int radius) {
int x = radius;
int y = 0;
int radiusError = 1 - x; //variable que se utiliza para controlar cómo se dibujan
los puntos del círculo

while (x >= y) {
drawCirclePoints(centerX, centerY, x, y);
y++;
if (radiusError < 0) {
radiusError += 2 * y + 1; //fórmula especificada por el algoritmo de Bresenham
} else {
x--;
radiusError += 2 * (y - x) + 1; //actualiza el radiusError
}
}
}

private void drawCirclePoints(int centerX, int centerY, int x, int y) {
Color color = Color.magenta;
pixel.putPixel(centerX, centerY, Color.blue);
pixel.putPixel(centerX + x, centerY + y, color);
pixel.putPixel(centerX - x, centerY + y, color);
pixel.putPixel(centerX + x, centerY - y, color);
pixel.putPixel(centerX - x, centerY - y, color);
pixel.putPixel(centerX + y, centerY + x, color);
pixel.putPixel(centerX - y, centerY + x, color);
pixel.putPixel(centerX + y, centerY - x, color);
pixel.putPixel(centerX - y, centerY - x, color);
}

public static void main(String[] args) {
middleCircle drawer = new middleCircle();

int centerX = 50;
int centerY = 50;
int radius = 40;

drawer.drawCircle(centerX, centerY, radius);
```

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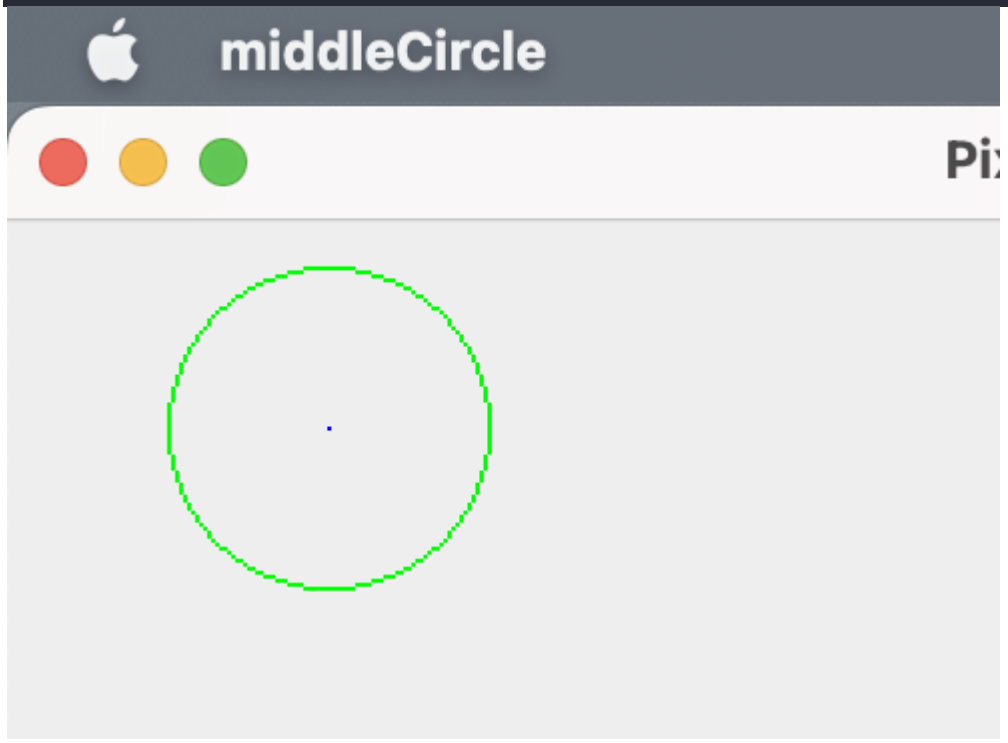
```
}
}
```



ELIPSE:

```
package PARCIALI;

import java.awt.Color;

public class Ellipses {
private pixel pixel;

public Ellipses() {
pixel = new pixel();
}

public void drawEllipse(int centerX, int centerY, int semiMajorAxis, int
semiMinorAxis) {
//para establecer las veces que se dara la vuelta
for (double angulo = 0; angulo <= 2 * Math.PI; angulo += 0.01) {
double x = centerX + semiMajorAxis * Math.cos(angulo);
double y = centerY + semiMinorAxis * Math.sin(angulo);
pixel.putPixel((int) x, (int) y, Color.magenta);
}

// Pinta las coordenadas del centro
```

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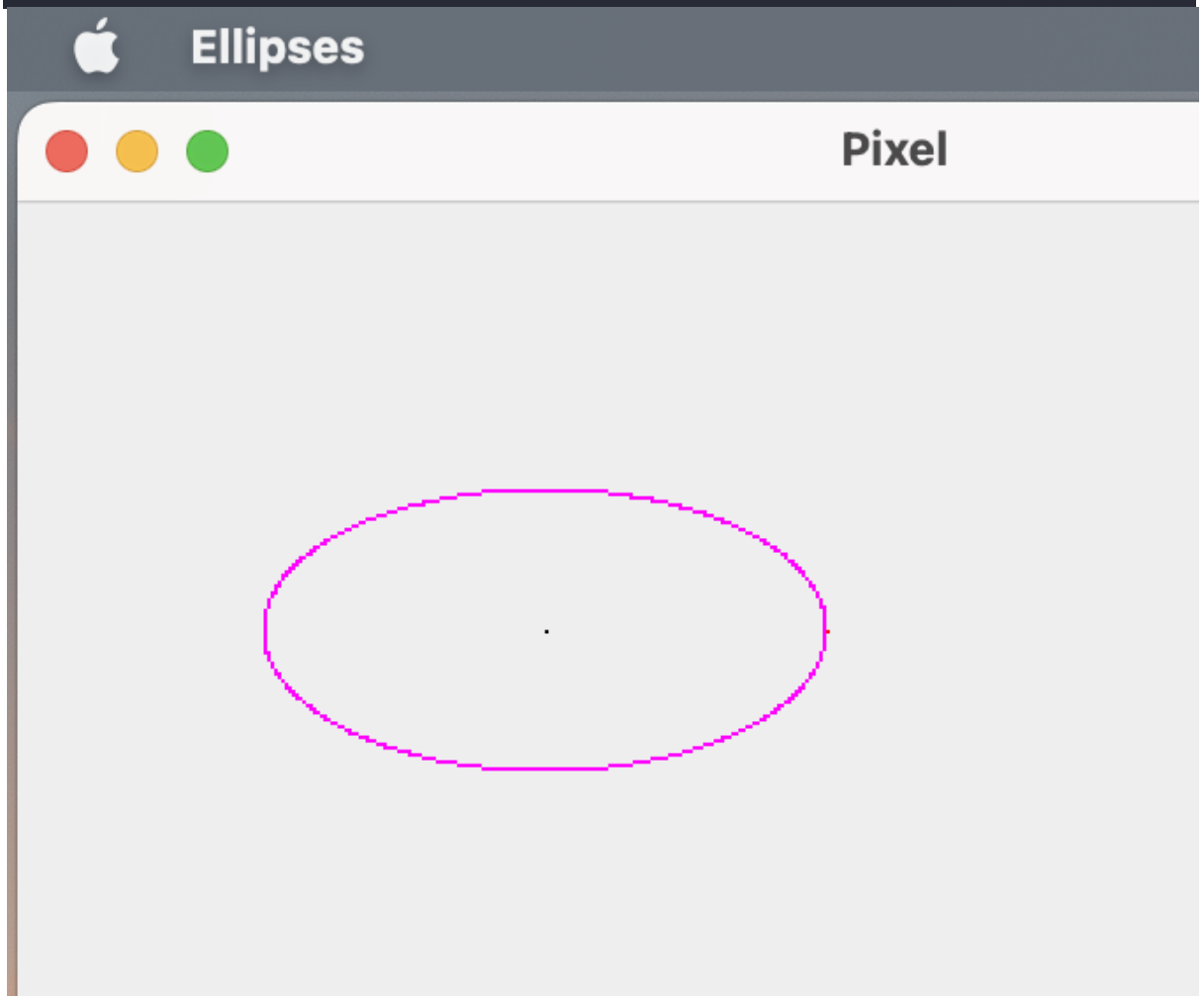
```
pixel.putPixel(centerX, centerY, Color.BLACK);
}

public static void main(String[] args) {
Ellipses drawer = new Ellipses();

int centerX = 150;
int centerY = 150;
int semiMajorAxis = 80;
int semiMinorAxis = 40;

drawer.drawEllipse(centerX, centerY, semiMajorAxis, semiMinorAxis);
}
}
```



RECTANGULO:

```
package PARCIALI;

import java.awt.Color;

public class Rectangle {
```

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```
private pixel pixel;

public Rectangle() {
pixel = new pixel();
}

public void drawRectangle(int centerX, int centerY, int width, int height) {
int ancho = width / 2;
int alt = height / 2;

// Dibuja los cuatro lados del rectángulo
for (int x = centerX - ancho; x <= centerX + ancho; x++) {
pixel.putPixel(x, centerY - alt, Color.blue);
pixel.putPixel(x, centerY + alt, Color.blue);
}
for (int y = centerY - alt; y <= centerY + alt; y++) {
pixel.putPixel(centerX - ancho, y, Color.blue);
pixel.putPixel(centerX + ancho, y, Color.blue);
}

// Pinta las coordenadas del centro
pixel.putPixel(centerX, centerY, Color.BLACK);
}

public static void main(String[] args) {
Rectangle drawer = new Rectangle();

int centerX = 150;
int centerY = 150;
int width = 100;
int height = 60;

drawer.drawRectangle(centerX, centerY, width, height);
}
}
```

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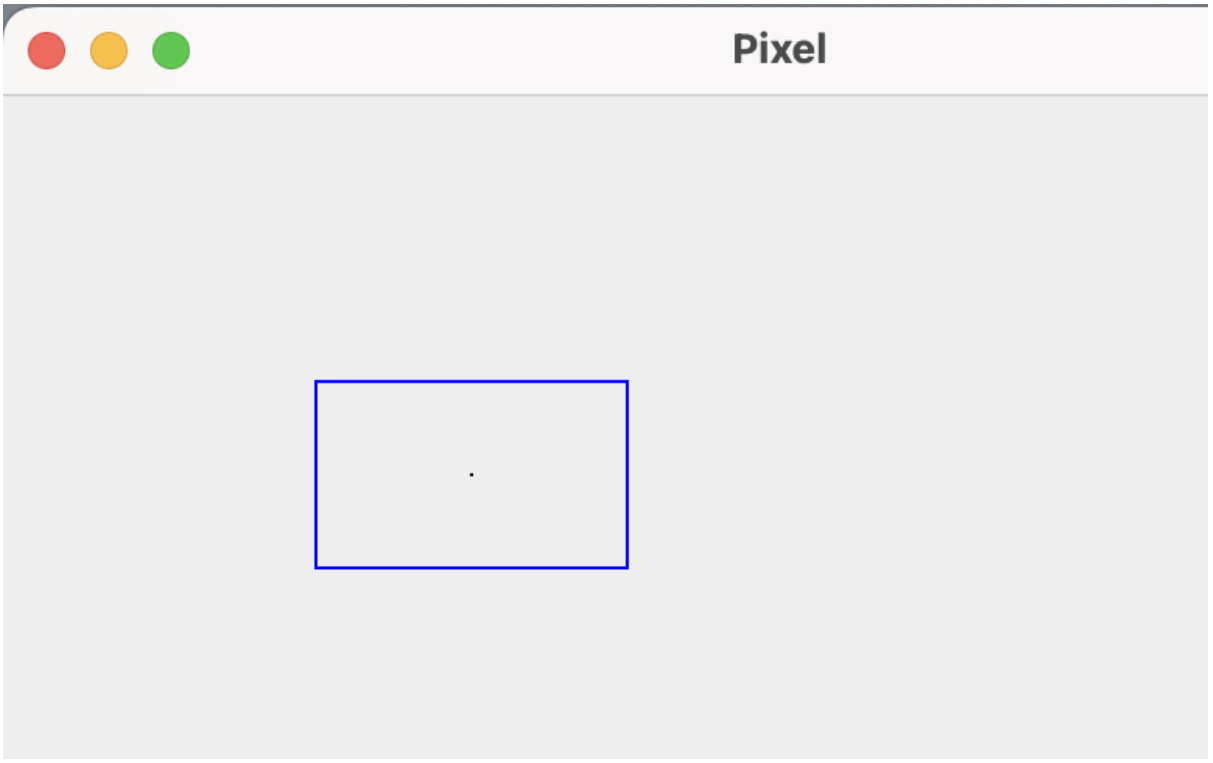

FIGURAS:
(CLASE DRAWFIGURAS, DONDE ESTAN LOS MÉTODOS)

```
package PARCIALI.figures;
import java.awt.Color;

import java.awt.Color;
import java.awt.Graphics;
import java.awt.Graphics2D;
import java.awt.image.BufferedImage;

import javax.swing.JFrame;

public class Drawfiguras extends javax.swing.JFrame{
JFrame panel = new JFrame();
private BufferedImage buffer;
private Graphics graPixel;
public Drawfiguras() {
setTitle("Figuras");
setSize(900,700);
setResizable(true);
setDefaultCloseOperation(EXIT_ON_CLOSE);
setVisible(true);
setLocationRelativeTo(null);
buffer = new BufferedImage(1,1, BufferedImage.TYPE_INT_RGB);
graPixel = (Graphics2D) buffer.createGraphics();
```

```
}

public void putPixel( int x, int y, Color c){
buffer.setRGB(0, 0, c.getRGB());
this.getGraphics().drawImage(buffer, x, y, this);
}

public void paint(Graphics g){
super.paint(g);
putPixel(80,80, Color.RED);

}

public void algorithmRect(int x1, int y1, int x2, int y2) {
int dx = x2 - x1;
int dy = y2 - y1;
double a = (double) dy / dx;
double b = y1 - a * x1;

for (int x = x1; x <= x2; x++) {
int y = (int) (a * x + b);
putPixel(x, y, Color.blue);
}
}

public void drawEllipse(int centerX, int centerY, int semiMajorAxis, int
semiMinorAxis) {
//para establecer las veces que se dara la vuelta
for (double theta = 0; theta <= 2 * Math.PI; theta += 0.01) {
double x = centerX + semiMajorAxis * Math.cos(theta);
double y = centerY + semiMinorAxis * Math.sin(theta);
putPixel((int) x, (int) y, Color.magenta);
}

// Pinta las coordenadas del centro
putPixel(centerX, centerY, Color.BLACK);
}

public void drawCircle(int xc, int yc, int radio) {
for (int x = -radio; x <= radio; x++) {
int y = (int) Math.round(Math.sqrt(radio * radio - x * x));
//son ocho cuadrantes para que salga completo
putPixel(xc + x, yc + y, Color.ORANGE);
putPixel(xc - x, yc + y, Color.ORANGE);
```

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```
putPixel(xc + x, yc - y, Color.ORANGE);
putPixel(xc - x, yc - y, Color.ORANGE);
putPixel(xc + y, yc + x, Color.ORANGE);
putPixel(xc - y, yc + x, Color.ORANGE);
putPixel(xc + y, yc - x, Color.ORANGE);
putPixel(xc - y, yc - x, Color.ORANGE);
//pinta las coordenanas del centro
putPixel(xc, yc, Color.BLACK);

}
}

public void drawRectangle(int centerX, int centerY, int width, int height) {
int ancho = width / 2;
int alt = height / 2;

// Dibuja los cuatro lados del rectángulo
for (int x = centerX - ancho; x <= centerX + ancho; x++) {
putPixel(x, centerY - alt, Color.blue);
putPixel(x, centerY + alt, Color.blue);
}
for (int y = centerY - alt; y <= centerY + alt; y++) {
putPixel(centerX - ancho, y, Color.blue);
putPixel(centerX + ancho, y, Color.blue);
}

// Pinta las coordenadas del centro
putPixel(centerX, centerY, Color.BLACK);
}
}
```

(CLASE FIGURAS FINAL, DONDE SE EJECUTAN LOS MÉTODOS)

```
package PARCIAL1.figures;

public class FigurasFinal {

public static void main(String[] args) {
Drawfiguras frame = new Drawfiguras();
frame.algorithmRect(30,80, 160, 260);
frame.algorithmRect(170, 100, 330, 100);
frame.algorithmRect(460, 260, 580, 50);
frame.algorithmRect(590, 260, 750, 260);
//circulos
frame.drawCircle(220, 480, 10);
frame.drawCircle(220, 480, 40);
frame.drawCircle(220, 480, 80);
```

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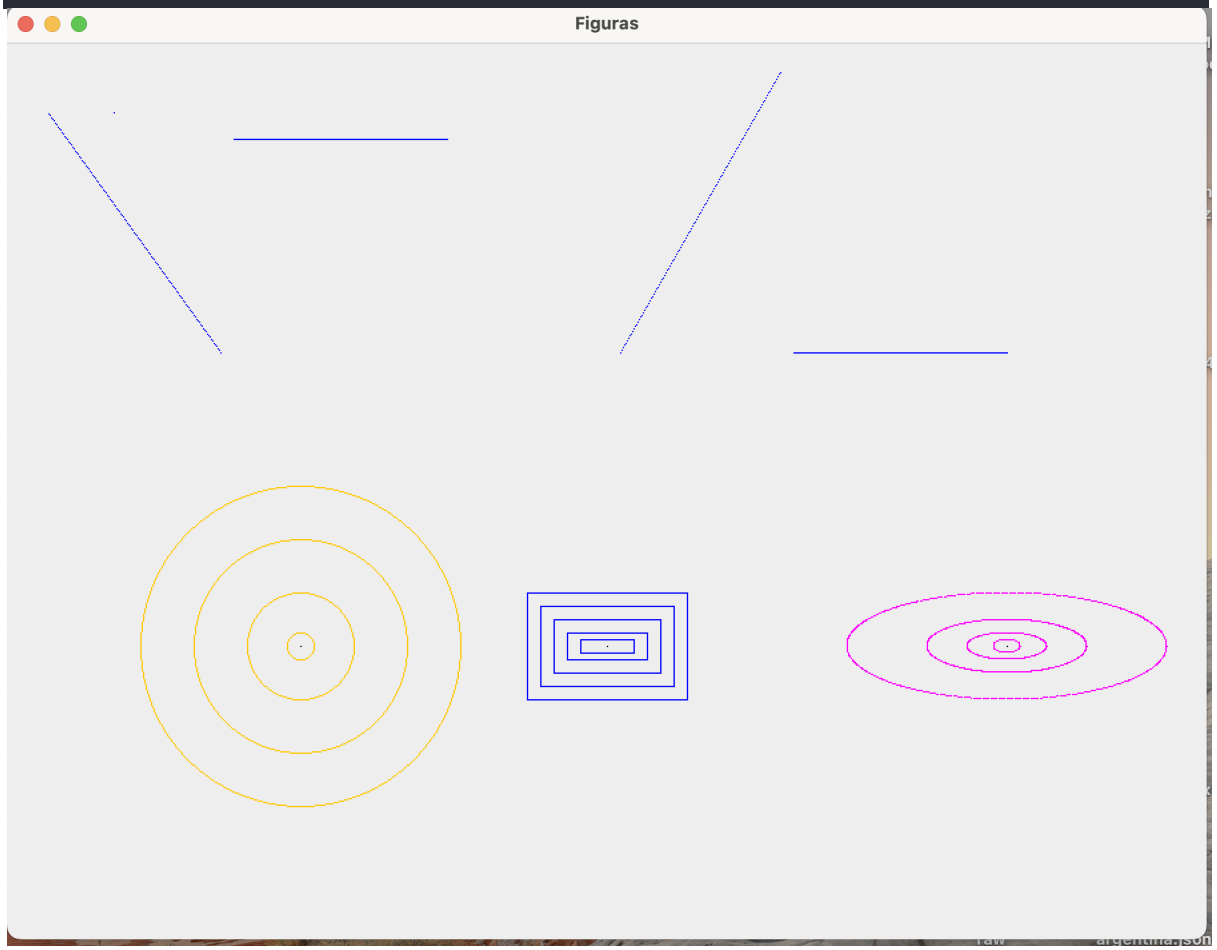
```
frame.drawCircle(220, 480, 120);
//Elipse
frame.drawEllipse(750, 480, 10, 5);
frame.drawEllipse(750, 480, 30, 10);
frame.drawEllipse(750, 480, 60, 20);
frame.drawEllipse(750, 480, 120, 40);
//Rectangulo
frame.drawRectangle(450, 480, 120, 80);
frame.drawRectangle(450, 480, 100, 60);
frame.drawRectangle(450, 480, 80, 40);
frame.drawRectangle(450, 480, 60, 20);
frame.drawRectangle(450, 480, 40, 10);
}
}
```



OTRAS PRÁCTICAS (YA ENTREGADAS):

BRESENHAM LINEA

```
package PARCIALI;
import java.awt.Color;
```

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```
import java.util.Scanner;

public class BresenhamLine extends javax.swing.JFrame {
private PARCIALI.pixel pixel; // Instancia de la clase Pixel

public BresenhamLine() {
pixel = new PARCIALI.pixel(); // Crear una instancia de la clase Pixel
}
public void drawBresenhamLine(int x1, int y1, int x2, int y2) {
int dx = Math.abs(x2 - x1);
int dy = Math.abs(y2 - y1);
int err = dx - dy;
int xStep = x1 < x2 ? 1 : -1; //si x1<x2 entonces se tomará 1 sino -1
int yStep = y1 < y2 ? 1 : -1;

while (x1 != x2 || y1 != y2) {
pixel.putPixel(x1, y1, Color.red);
int err2 = 2 * err;

if (err2 > -dy) {
err -= dy;
x1 += xStep;
}

if (err2 < dx) {
err += dx;
y1 += yStep;
}
}

// pixel.putPixel(x2, y2, Color.green);
}

public static void main(String[] args) {
BresenhamLine lineDrawer = new BresenhamLine();
Scanner in = new Scanner(System.in);
System.out.println("Enter coordinates of 1st point");
int x1 = in.nextInt() * 10;
int y1 = in.nextInt() * 10;

System.out.println("Enter coordinates of 2nd point");
int x2 = in.nextInt() * 10;
int y2 = in.nextInt() * 10;

lineDrawer.drawBresenhamLine(x1, y1, x2, y2);
```

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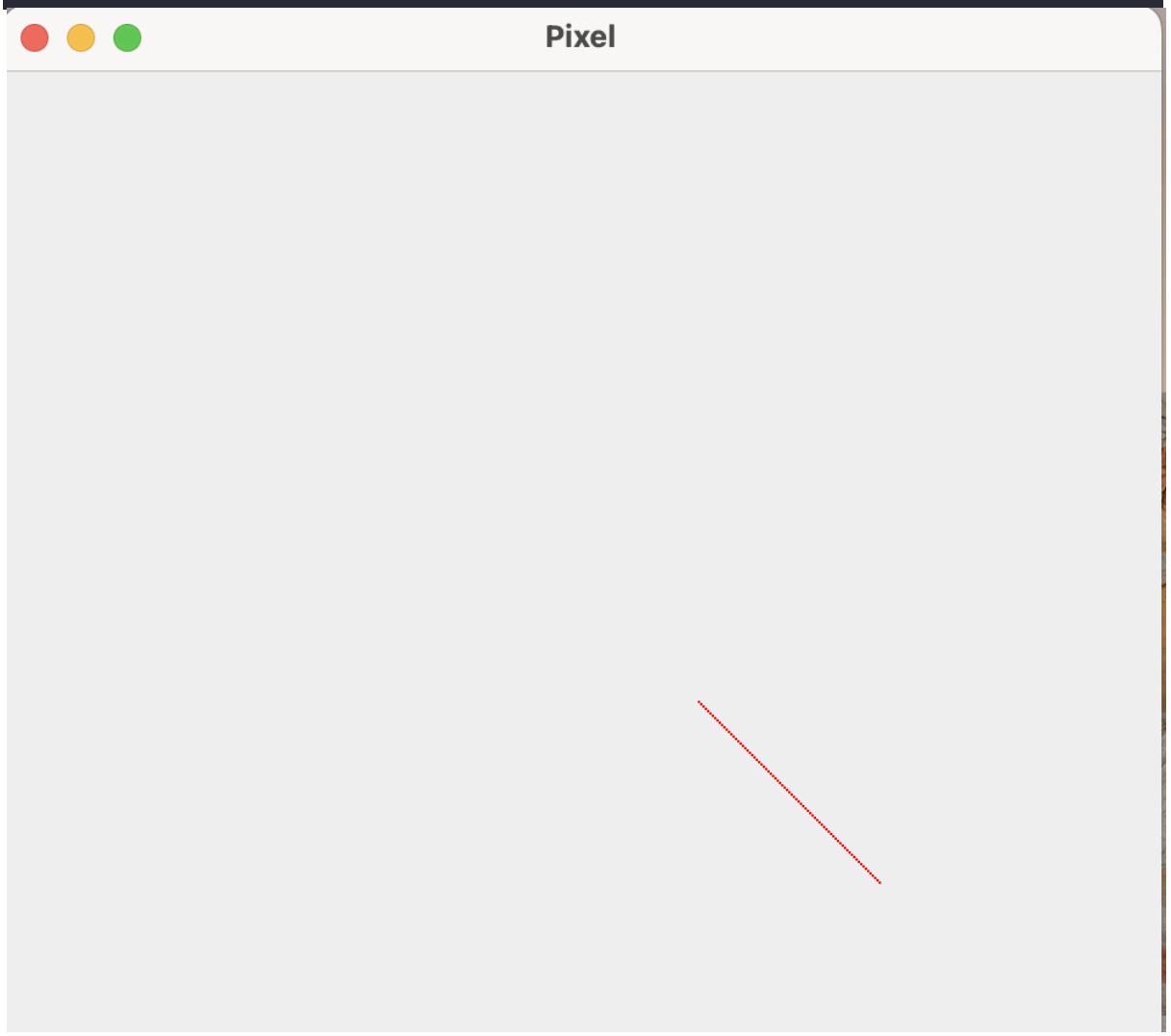
```
}
}
```



DDA:

```
package PARCIALI;
import java.awt.Color;
import java.awt.Frame;
import java.util.Scanner;


public class DDA extends javax.swing.JFrame {

private PARCIALI.pixel pixel; // Instancia de la clase Pixel

public DDA() {
pixel = new PARCIALI.pixel(); // Crear una instancia de la clase Pixel
}
```

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```
public void DDALine(int x1, int y1, int x2, int y2) {
double dx, dy, x, y, steps;
int k;
dx = x2 - x1;
dy = y2 - y1;
if (Math.abs(dy) <= Math.abs(dx)) {
steps = Math.abs(dx);
} else {
steps = Math.abs(dy);
}
dx = dx / steps;
dy = dy / steps;
x = x1;
y = y1;
k = 1;
// Draw the first point
pixel.putPixel((int) x1, (int) y1, Color.RED);
if (x1 <= x2) {
// Draw the line from left to right
while (k <= steps) {
x += dx;
y += dy;
k++;
// Draw the points in red
pixel.putPixel((int) x, (int) y, Color.RED);
}
} else {
// Draw the line from right to left
while (k <= steps) {
x -= dx;
y -= dy;
k++;
// Draw the points in red
pixel.putPixel((int) x, (int) y, Color.blue);
}
}
}


public static void main(String args[]) {
DDA frame = new DDA();

Scanner in = new Scanner(System.in);
System.out.println("Enter coordinates of 1st point");
int x1 = in.nextInt()*10;
```

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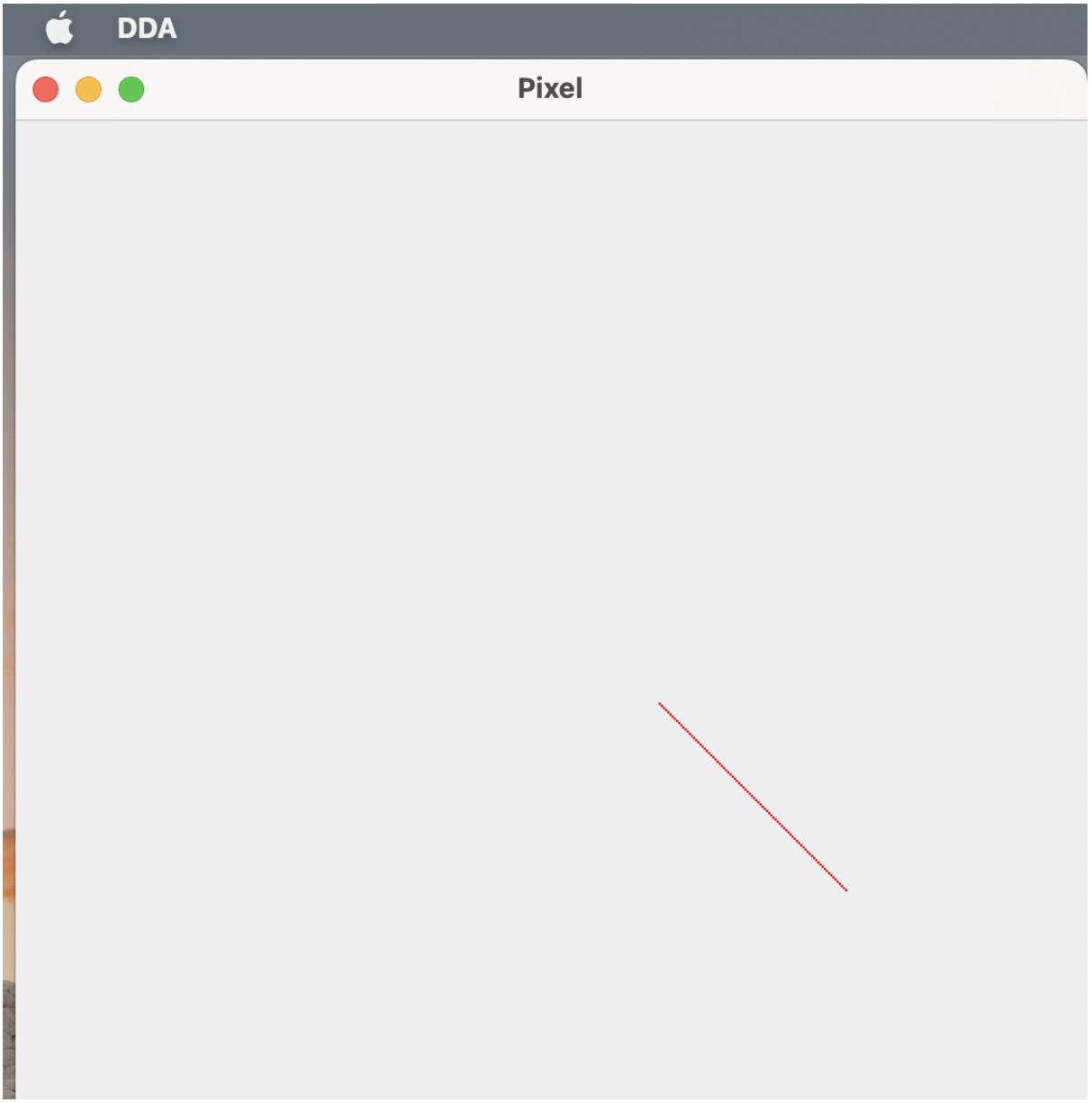
```
int y1 = in.nextInt()*10;

System.out.println("Enter coordinates of 2nd point");
int x2 = in.nextInt()*10;
int y2 = in.nextInt()*10;

frame.DDALine(x1, y1, x2, y2);
}

}
```

(IZQ → DER: ROJO)



(DER→ IZQ: AZUL)

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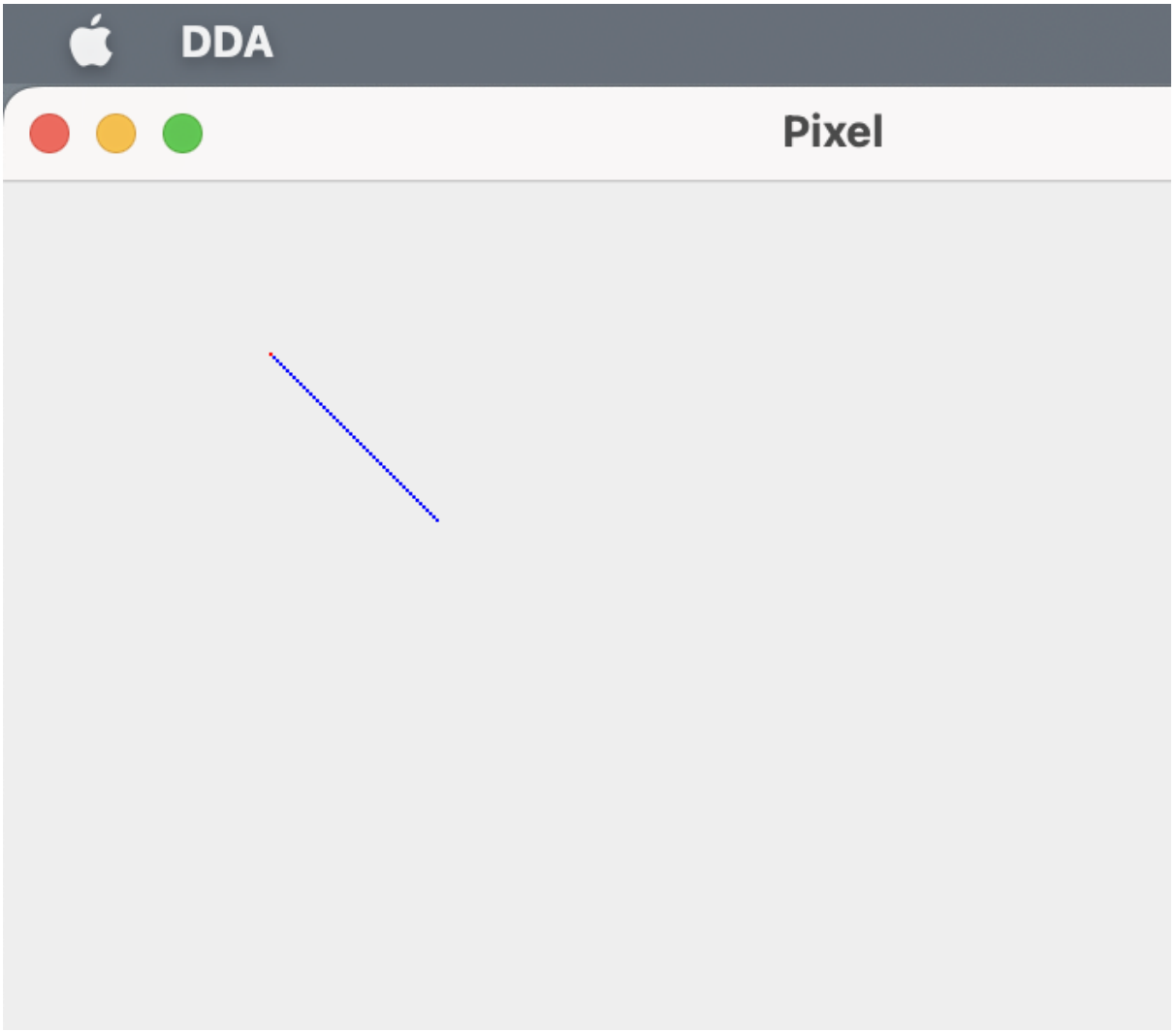

LINEA PUNTO MEDIO

```
package PARCIALI;

import java.awt.Color;
import java.util.Scanner;

public class middlePoint extends javax.swing.JFrame {
private PARCIALI.pixel pixel; // Instancia de la clase Pixel

public middlePoint() {
pixel = new PARCIALI.pixel(); // Crear una instancia de la clase Pixel
}
public void drawMidpointLine(int x1, int y1, int x2, int y2) {
int am = (x1 + x2) / 2;
int bm = (y1 + y2) / 2;
int dx = x2 - x1;
int dy = y2 - y1;
double a = (double) dy / dx;
```

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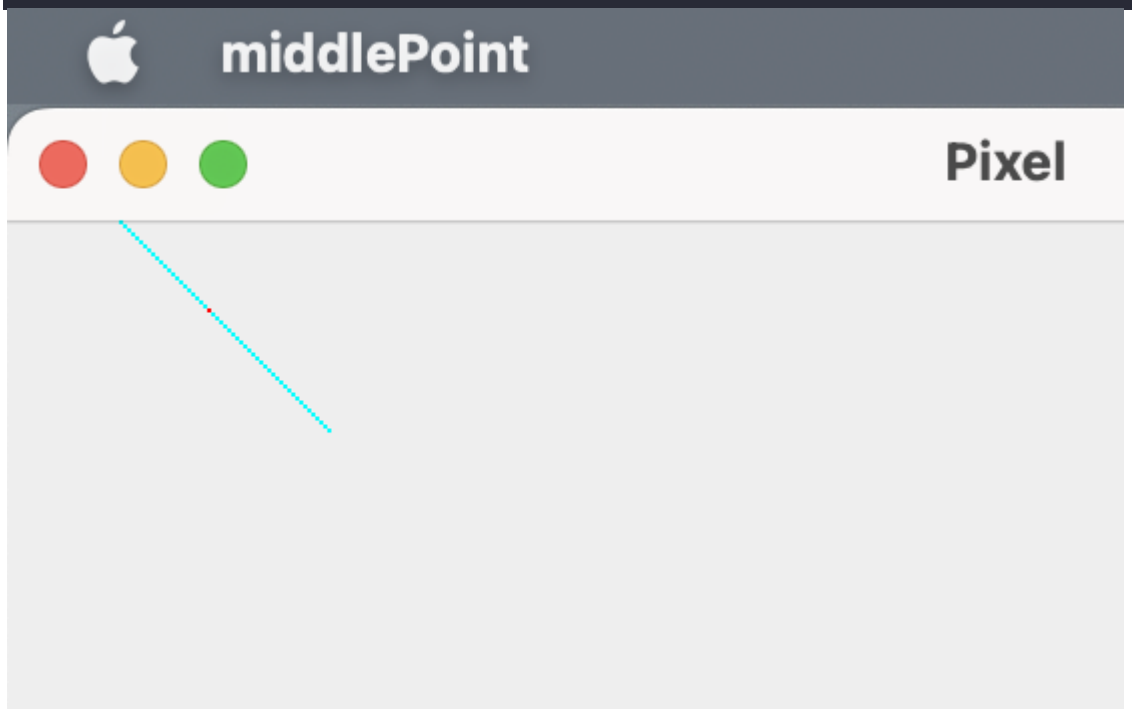
```
double b = y1 - a * x1;
//bucle for draw the pixels
for (int x = x1; x <= x2; x++) {
int y = (int) (a * x + b);
pixel.putPixel(x, y, Color.cyan);
}
//draw the middle point
pixel.putPixel(am,bm, Color.red);

}

public static void main(String args[]) {
middlePoint frame = new middlePoint();

Scanner in = new Scanner(System.in);
System.out.println("Enter coordinates of 1st point");
int x1 = in.nextInt() * 10;
int y1 = in.nextInt() * 10;

System.out.println("Enter coordinates of 2nd point");
int x2 = in.nextInt() * 10;
int y2 = in.nextInt() * 10;

frame.drawMidpointLine(x1, y1, x2, y2);
}

}
```



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LINEA RECTA:

```
package PARCIALI;

import java.awt.Color;
import java.awt.Frame;
import java.util.Scanner;


public class RectLine extends Frame {
private PARCIALI.pixel pixel; // Instancia de la clase Pixel

public RectLine() {

pixel = new PARCIALI.pixel(); // Crear una instancia de la clase Pixel
}

public void algorithmRect(int x1, int y1, int x2, int y2) {
int dx = x2 - x1;
int dy = y2 - y1;
double a = (double) dy / dx;
double b = y1 - a * x1;

for (int x = x1; x <= x2; x++) {
int y = (int) (a * x + b);
pixel.putPixel(x, y, Color.green);
}
}

public static void main(String args[]) {
RectLine frame = new RectLine();

Scanner in = new Scanner(System.in);
System.out.println("Enter coordinates of 1st point");
int x1 = in.nextInt()*10;

int y1 = in.nextInt()*10;
System.out.println("Enter coordinates of 2st point");
int x2 = in.nextInt()*10;
int y2 = in.nextInt()*10;

frame.algorithmRect(x1, y1, x2, y2);
}


}
```

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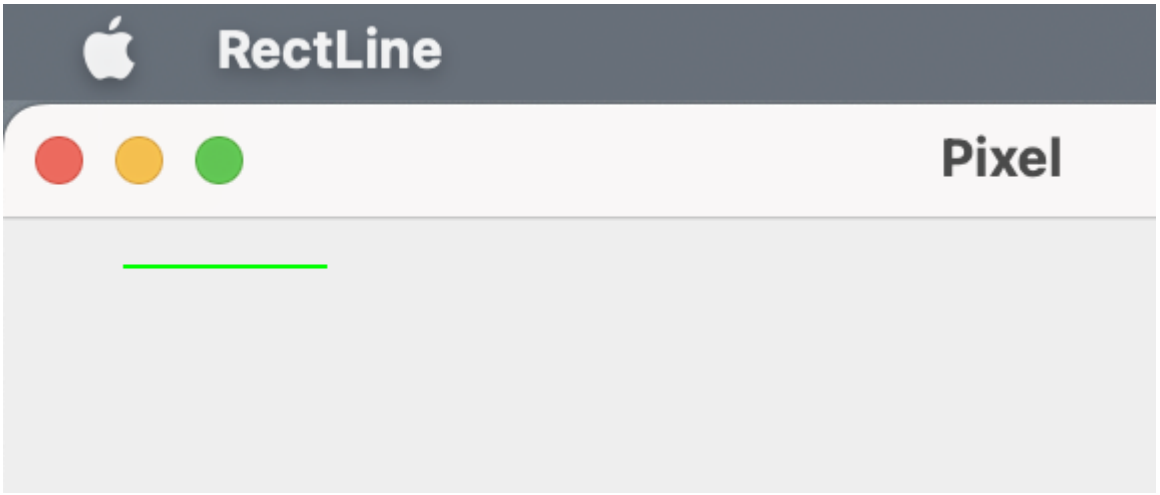

LINK AL REPOSITORIO:
https://github.com/YazminUrzua/GRAFICAS2D.git