Uniwersytet
Jana Długosza
w Częstochowie

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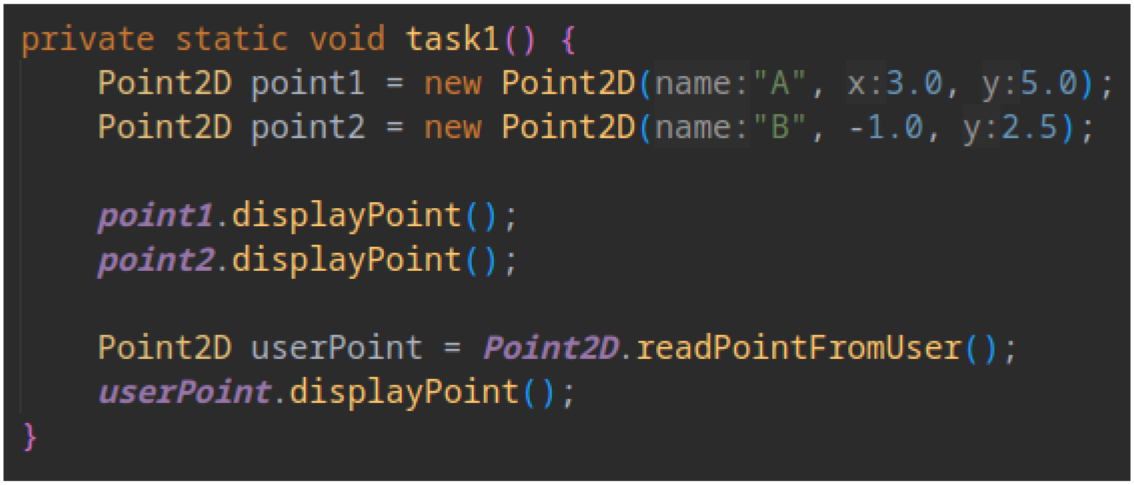
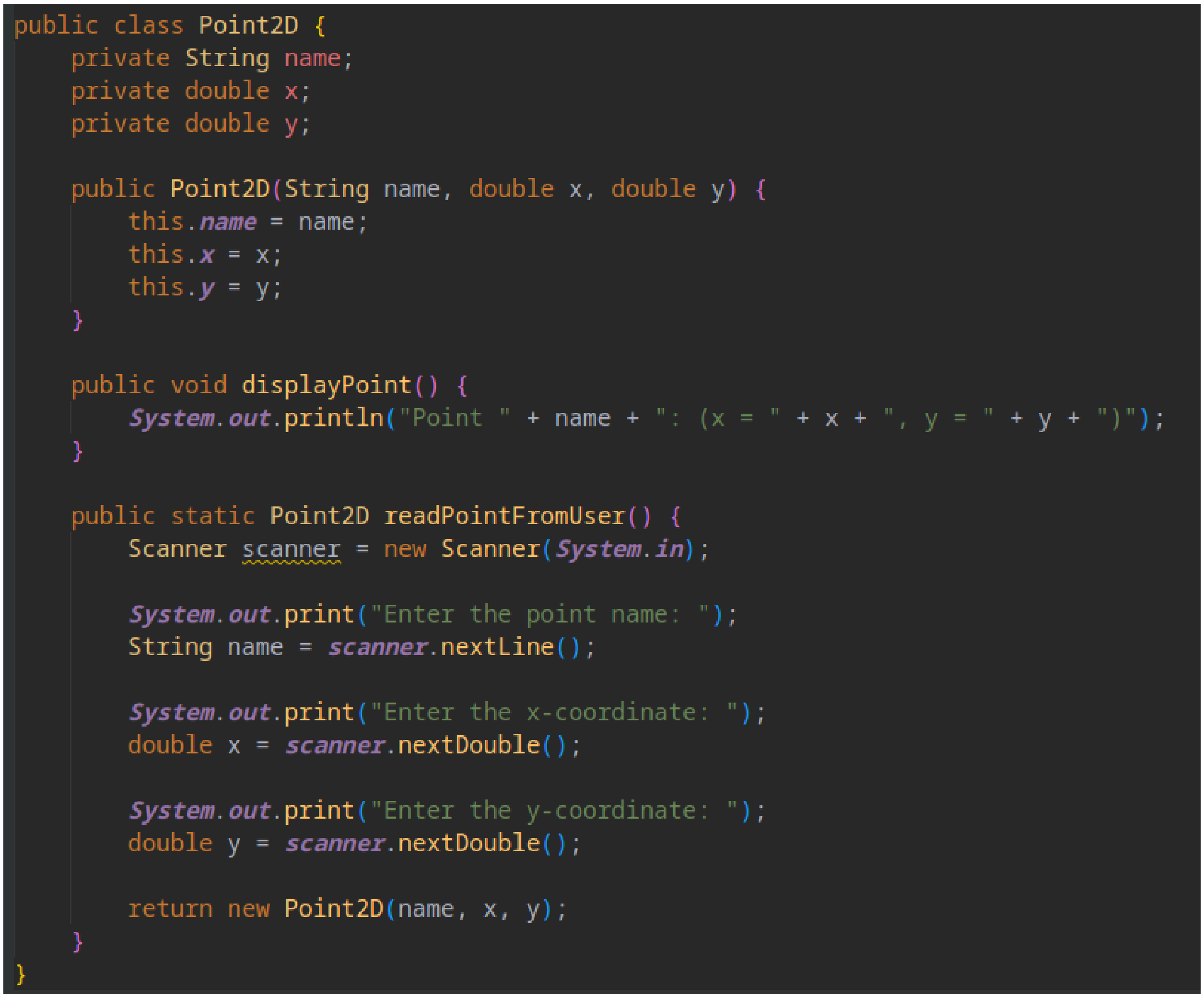
Studia stacjonarne 1 stopnia,

2 rok informatyka, grupa 1

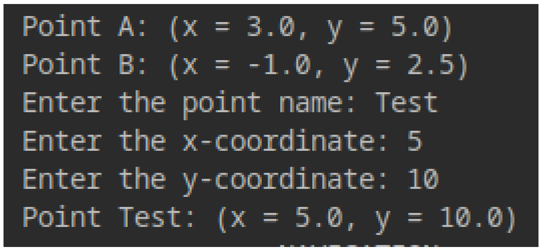
Zadanie 1



```java
private static void task1() {
    Point2D point1 = new Point2D(name:"A", x:3.0, y:5.0);
    Point2D point2 = new Point2D(name:"B", -1.0, y:2.5);

    point1.displayPoint();
    point2.displayPoint();

    Point2D userPoint = Point2D.readPointFromUser();
    userPoint.displayPoint();
}
```

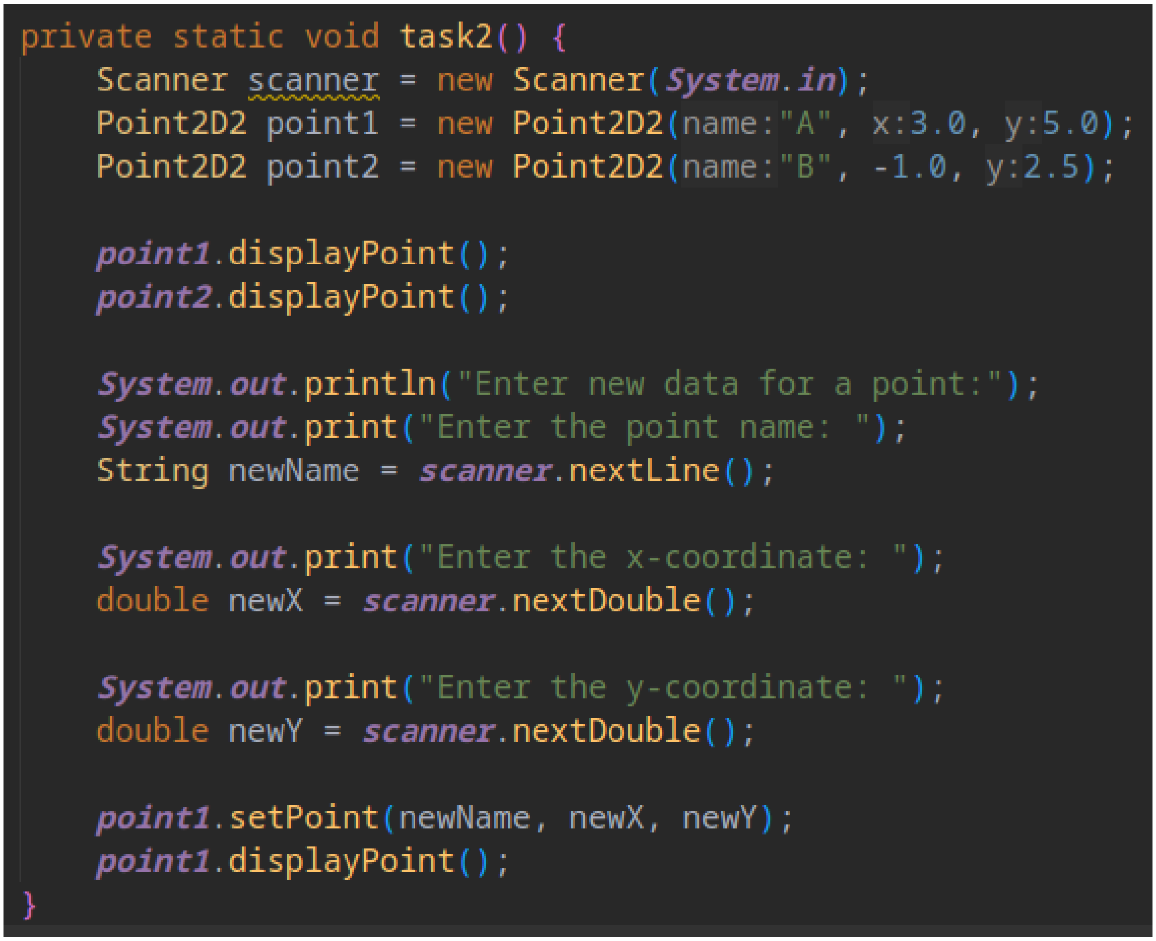


```java
public class Point2D {
    private String name;
    private double x;
    private double y;

    public Point2D(String name, double x, double y) {
        this.name = name;
        this.x = x;
        this.y = y;
    }

    public void displayPoint() {
        System.out.println("Point " + name + ": (x = " + x + ", y = " + y + ")");
    }

    public static Point2D readPointFromUser() {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the point name: ");
        String name = scanner.nextLine();

        System.out.print("Enter the x-coordinate: ");
        double x = scanner.nextDouble();

        System.out.print("Enter the y-coordinate: ");
        double y = scanner.nextDouble();

        return new Point2D(name, x, y);
    }
}
```

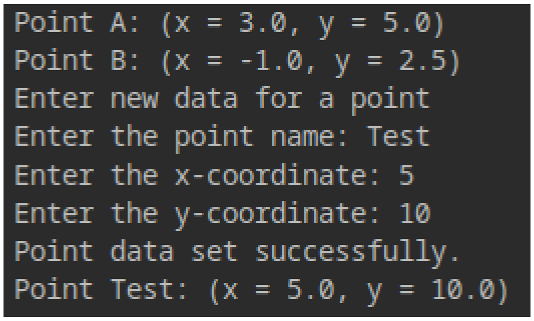


```
Point A: (x = 3.0, y = 5.0)
Point B: (x = -1.0, y = 2.5)
Enter the point name: Test
Enter the x-coordinate: 5
Enter the y-coordinate: 10
Point Test: (x = 5.0, y = 10.0)
```

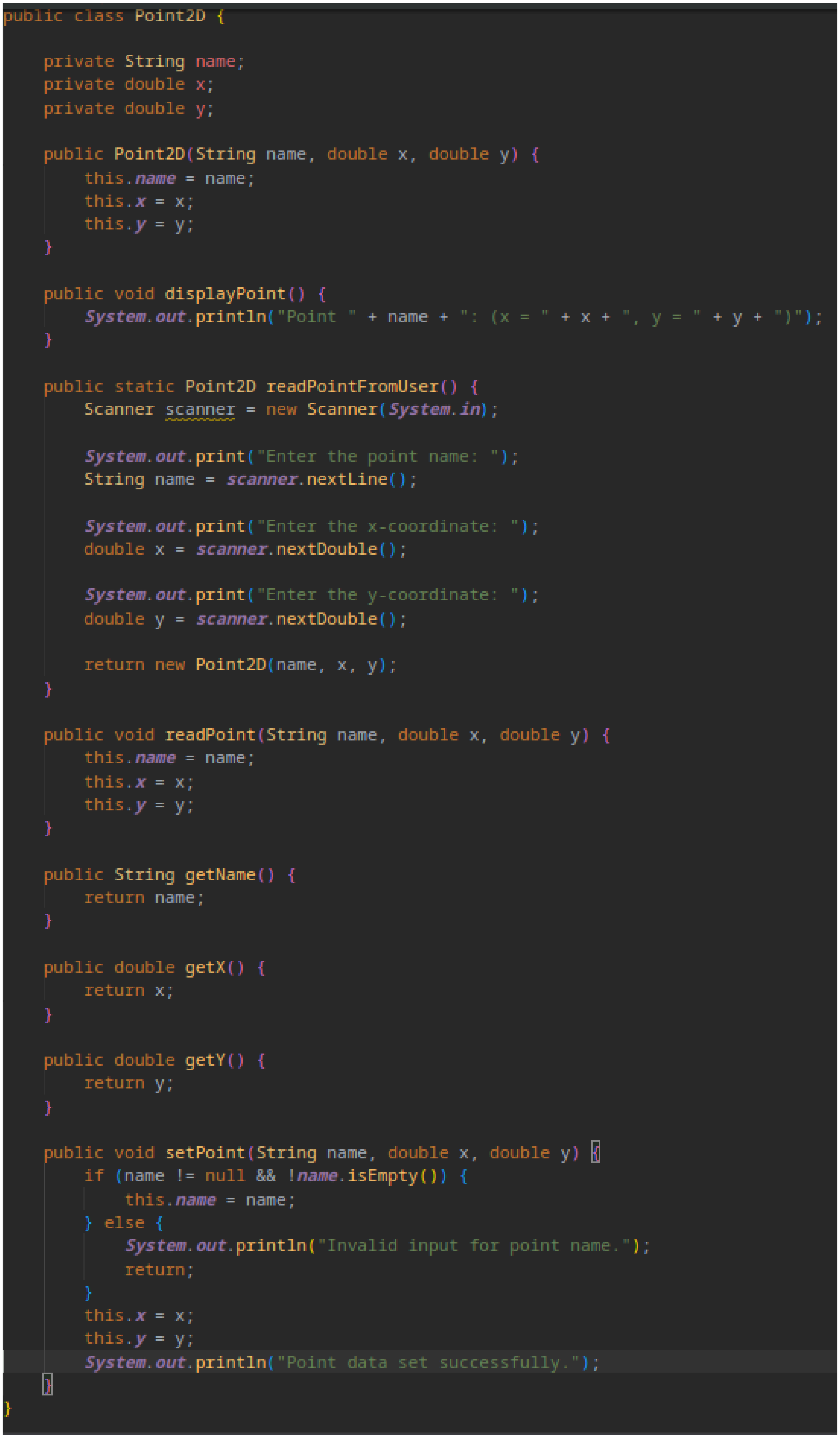
Zadanie 2



```java
private static void task2() {
    Scanner scanner = new Scanner(System.in);
    Point2D2 point1 = new Point2D2(name:"A", x:3.0, y:5.0);
    Point2D2 point2 = new Point2D2(name:"B", -1.0, y:2.5);

    point1.displayPoint();
    point2.displayPoint();

    System.out.println("Enter new data for a point:");
    System.out.print("Enter the point name: ");
    String newName = scanner.nextLine();

    System.out.print("Enter the x-coordinate: ");
    double newX = scanner.nextDouble();

    System.out.print("Enter the y-coordinate: ");
    double newY = scanner.nextDouble();

    point1.setPoint(newName, newX, newY);
    point1.displayPoint();
}
```

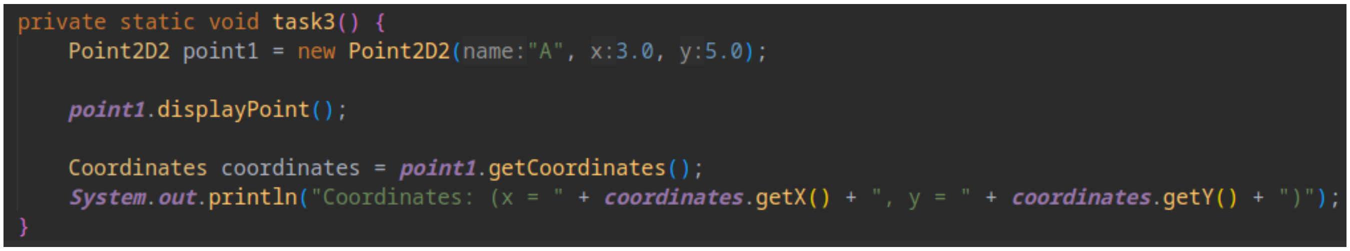


```
Point A: (x = 3.0, y = 5.0)
Point B: (x = -1.0, y = 2.5)
Enter new data for a point
Enter the point name: Test
Enter the x-coordinate: 5
Enter the y-coordinate: 10
Point data set successfully.
Point Test: (x = 5.0, y = 10.0)
```

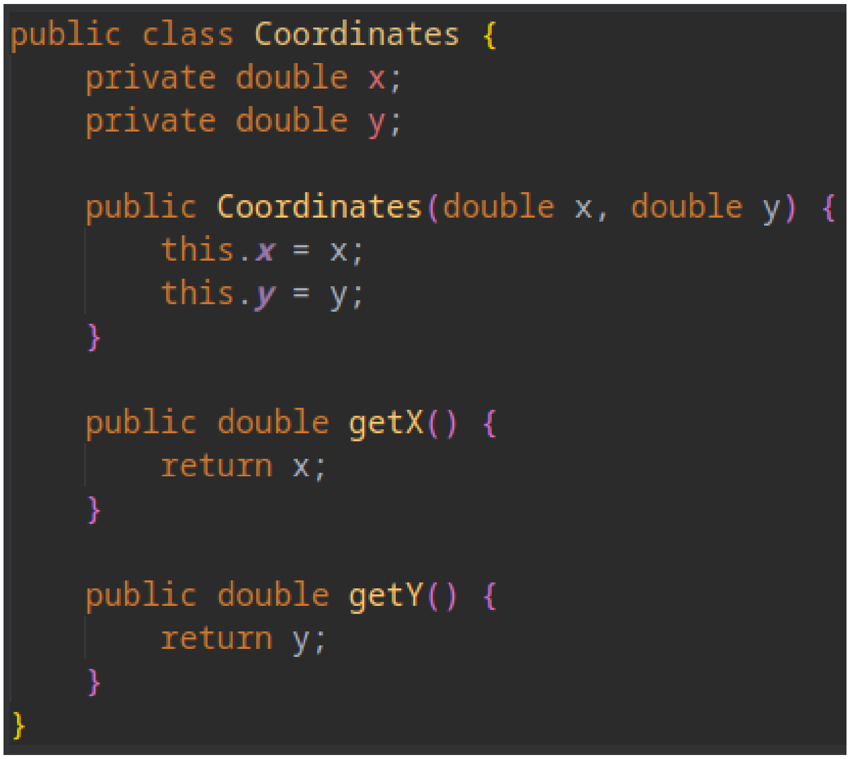


```java
public class Point2D {

    private String name;
    private double x;
    private double y;

    public Point2D(String name, double x, double y) {
        this.name = name;
        this.x = x;
        this.y = y;
    }

    public void displayPoint() {
        System.out.println("Point " + name + ": (x = " + x + ", y = " + y + ")");
    }

    public static Point2D readPointFromUser() {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the point name: ");
        String name = scanner.nextLine();

        System.out.print("Enter the x-coordinate: ");
        double x = scanner.nextDouble();

        System.out.print("Enter the y-coordinate: ");
        double y = scanner.nextDouble();

        return new Point2D(name, x, y);
    }

    public void readPoint(String name, double x, double y) {
        this.name = name;
        this.x = x;
        this.y = y;
    }

    public String getName() {
        return name;
    }

    public double getX() {
        return x;
    }

    public double getY() {
        return y;
    }

    public void setPoint(String name, double x, double y) {
        if (name != null && !name.isEmpty()) {
            this.name = name;
        } else {
            System.out.println("Invalid input for point name.");
            return;
        }
        this.x = x;
        this.y = y;
        System.out.println("Point data set successfully.");
    }
}
```

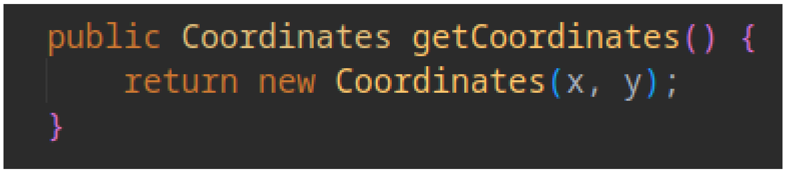
Zadanie 3



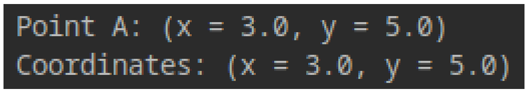
```
private static void task3() {
    Point2D2 point1 = new Point2D2(name:"A", x:3.0, y:5.0);

    point1.displayPoint();

    Coordinates coordinates = point1.getCoordinates();
    System.out.println("Coordinates: (x = " + coordinates.getX() + ", y = " + coordinates.getY() + ")");
}
```



```
public class Coordinates {
    private double x;
    private double y;

    public Coordinates(double x, double y) {
        this.x = x;
        this.y = y;
    }

    public double getX() {
        return x;
    }

    public double getY() {
        return y;
    }
}
```

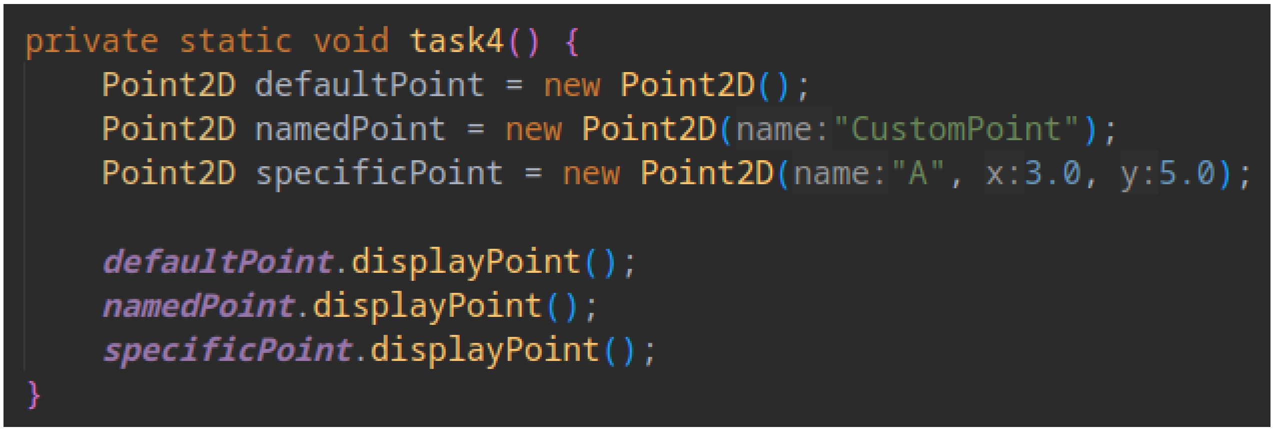


```
  public Coordinates getCoordinates() {
      return new Coordinates(x, y);
  }
```

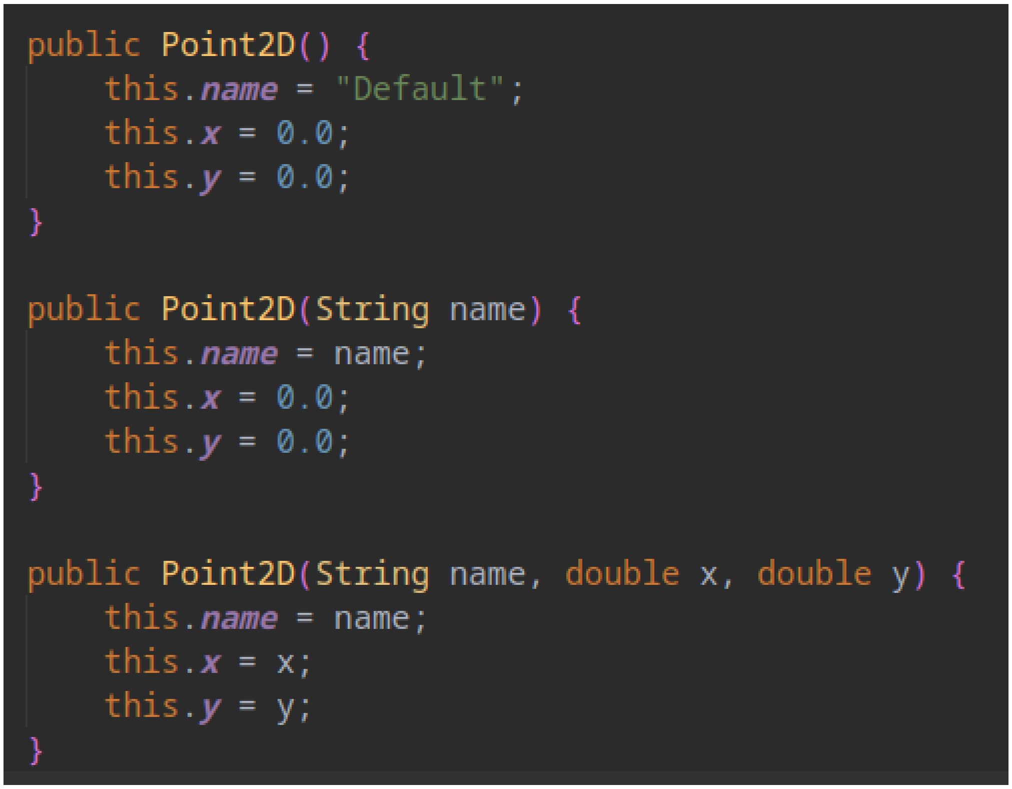


```
Point A: (x = 3.0, y = 5.0)
Coordinates: (x = 3.0, y = 5.0)
```

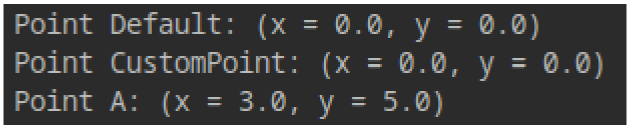
Zadanie 4



```java
private static void task4() {
    Point2D defaultPoint = new Point2D();
    Point2D namedPoint = new Point2D(name:"CustomPoint");
    Point2D specificPoint = new Point2D(name:"A", x:3.0, y:5.0);

    defaultPoint.displayPoint();
    namedPoint.displayPoint();
    specificPoint.displayPoint();
}
```

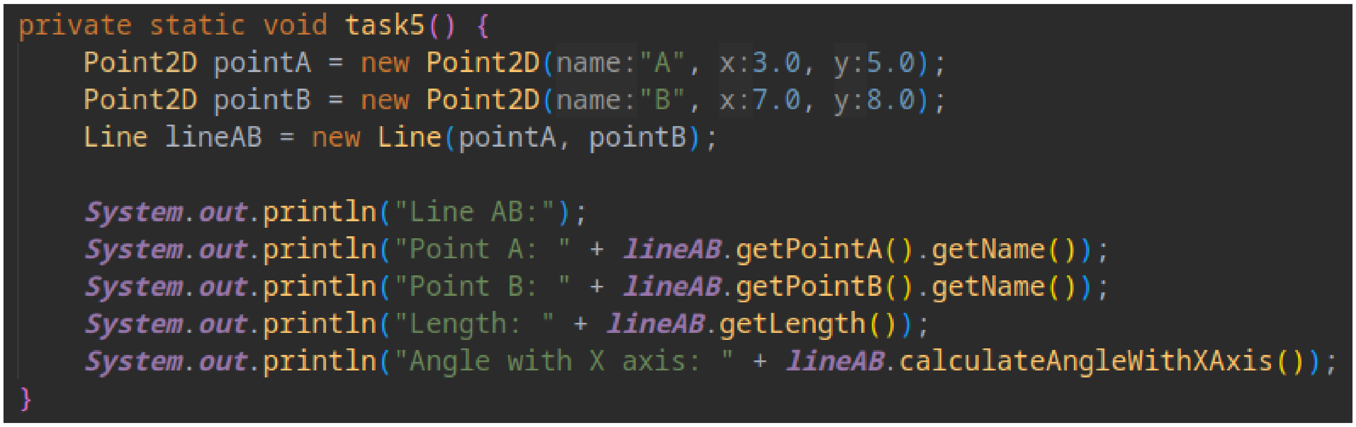


```java
public Point2D() {
    this.name = "Default";
    this.x = 0.0;
    this.y = 0.0;
}

public Point2D(String name) {
    this.name = name;
    this.x = 0.0;
    this.y = 0.0;
}

public Point2D(String name, double x, double y) {
    this.name = name;
    this.x = x;
    this.y = y;
}
```

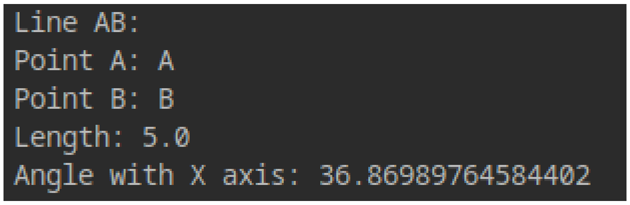


```
Point Default: (x = 0.0, y = 0.0)
Point CustomPoint: (x = 0.0, y = 0.0)
Point A: (x = 3.0, y = 5.0)
```

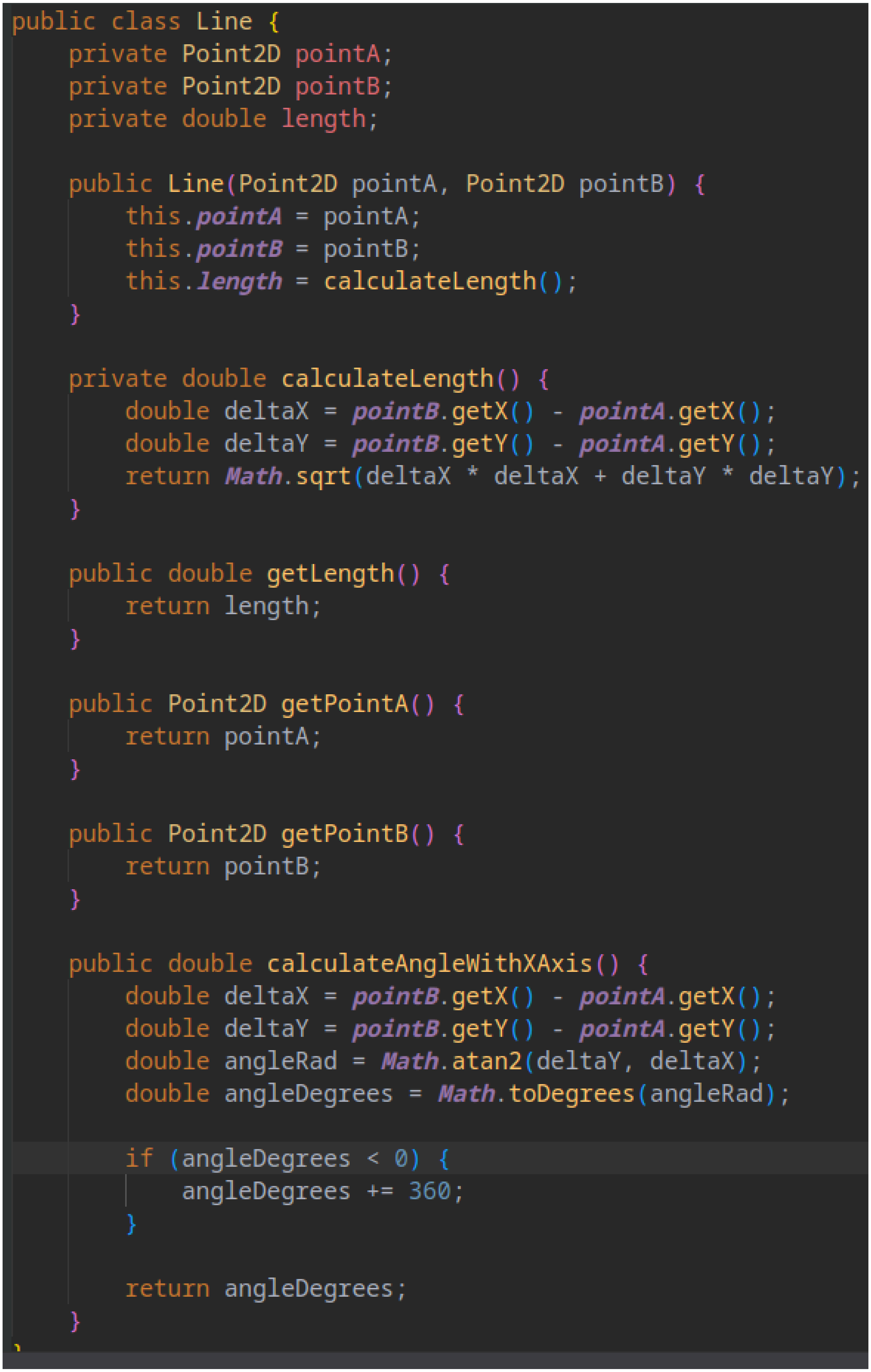
Zadanie 5



```java
private static void task5() {
    Point2D pointA = new Point2D(name:"A", x:3.0, y:5.0);
    Point2D pointB = new Point2D(name:"B", x:7.0, y:8.0);
    Line lineAB = new Line(pointA, pointB);

    System.out.println("Line AB:");
    System.out.println("Point A: " + lineAB.getPointA().getName());
    System.out.println("Point B: " + lineAB.getPointB().getName());
    System.out.println("Length: " + lineAB.getLength());
    System.out.println("Angle with X axis: " + lineAB.calculateAngleWithXAxis());
}
```



```
Line AB:
Point A: A
Point B: B
Length: 5.0
Angle with X axis: 36.86989764584402
```



```
public class Line {
    private Point2D pointA;
    private Point2D pointB;
    private double length;

    public Line(Point2D pointA, Point2D pointB) {
        this.pointA = pointA;
        this.pointB = pointB;
        this.length = calculateLength();
    }

    private double calculateLength() {
        double deltaX = pointB.getX() - pointA.getX();
        double deltaY = pointB.getY() - pointA.getY();
        return Math.sqrt(deltaX * deltaX + deltaY * deltaY);
    }

    public double getLength() {
        return length;
    }

    public Point2D getPointA() {
        return pointA;
    }

    public Point2D getPointB() {
        return pointB;
    }

    public double calculateAngleWithXAxis() {
        double deltaX = pointB.getX() - pointA.getX();
        double deltaY = pointB.getY() - pointA.getY();
        double angleRad = Math.atan2(deltaY, deltaX);
        double angleDegrees = Math.toDegrees(angleRad);

        if (angleDegrees < 0) {
            angleDegrees += 360;
        }

        return angleDegrees;
    }
}
```