评分与评语：

**台州学院**

**电子与信息工程学院实验报告**

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实验课程： Java程序设计基础

实验项目： Java Programming Basics and Data Types

**NOTE：**

**When pasting code, please do not use a black background. Otherwise, when the teacher prints your assignments at the end of the semester, it will be a mess of black.**

实验日期： 2025 年 3 月 6 日

**Project: Geometry: point in a rectangle?**

Problem Description:

Write a program that prompts the user to enter a point (x, y) and checks whether the point is within the rectangle centered at (0, 0) with width 10 and height 5. For example, (2, 2) is inside the rectangle and (6, 4) is outside the rectangle, as shown in the Figure.

(Hint: A point is in the rectangle if its horizontal distance to (0, 0) is less than or equal to 10 / 2 and its vertical distance to (0, 0) is less than or equal to 5 / 2.)



Here are sample runs of the program:

Sample 1:

Enter a point with two coordinates: 2 2

Point (2.0, 2.0) is in the rectangle

Sample 2:

Enter a point with two coordinates: 6 4

Point (6.0, 4.0) is not in the rectangle

Analysis:

In the problem description above is clear enough that we need an input from user that is two coordinates point, which the point is not exceeding 10 / 2 (-5, 5) horizontal point and 5 / 2 (-2.5, 2.5) vertical point to be considered inside the rectangle.

Design:

First, define two variables of width and height as its rectangle points. Second, create a prompt to input the coordinates from user. Third, check the condition whether the coordinates that user input is inside or outside the rectangle with a boolean expression explicitly.

Coding:

import java.util.Scanner;  
  
public class Excercise03\_23 {  
 public static void main(String[] *args*) {  
 double width = 10;  
 double height = 5;  
  
 Scanner input = new Scanner(System.in);  
 System.out.print("Enter a point with two coordinates: ");  
 double xAxis = input.nextDouble();  
 double yAxis = input.nextDouble();  
  
 // to check whether the point is in the rectangle by its the negative and positive range  
 if (xAxis <= -width / 2 && xAxis <= width &&  
 yAxis <= -height / 2 && yAxis <= height) {  
 System.out.println("Point " + "(" + xAxis + ", " + yAxis +  
 ")" + " is in rectangle");  
 } else {  
 System.out.println("Point " + "(" + xAxis + ", " + yAxis +  
 ")" + " is not in the rectangle");  
 }  
 }  
}

Testing:

Run the program, in the console, input two coordinates such as 1 2, 4 6, 8 6, etc. The program will execute the input and show the result of whether it is in the rectangle or is not.