**Question A**

Your goal for this question is to write a program that accepts two lines (x1,x2) and (x3,x4) on the x-axis and returns whether they overlap. As an example, (1,5) and (2,6) overlaps but not (1,5) and (6,8).

**Answer :-**

```
import java.util.Scanner;
public class LineSegmentOverlap {
	public static boolean doSegmentsOverlap(int x1, int x2, int x3, int x4) {
		// Here we are checking two line segments overlap by comparing their endpoint
		// values.
		// Segments (x1, x2) and (x3, x4) can be overlap if x2 is greater than or equal
		// to x3,
		// and x4 is greater than or equal to x1.
		return x2 >= x3 && x4 >= x1;
	}
	public static void main(String[] args) {
		// Input: Take two pairs of points (x1, x2) and (x3, x4) from the user.
		try (Scanner scanner = new Scanner(System.in)) {
			System.out.print("Enter the endpoints of the first line segment (x1 x2): ");
			int x1 = scanner.nextInt();
			int x2 = scanner.nextInt();

			System.out.print("Enter the endpoints of the second line segment (x3 x4): ");
			int x3 = scanner.nextInt();
			int x4 = scanner.nextInt();

			// Check if the line segments overlap and display the result.
			boolean overlap = doSegmentsOverlap(x1, x2, x3, x4);
			if (overlap) {
				System.out.println("The line segments overlap.");
			} else {
				System.out.println("The line segments do not overlap.");
			}
		}
	}
}
```

In this program, the doSegmentsOverlap method takes four integers representing the endpoints of two line segments, (x1, x2) and (x3, x4), and returns true if they overlap and false if they do not.

The main method provides sample input values and checks if the line segments overlap. This program will output whether the two line segments overlap or not based on the input values provided in the main method.

Using TDD approach, all test cases are defined in LineSegmentOverlapTest.java. (available in github)