Kangaroo

by wanbo

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There are two kangaroos on a number line ready to jump in the positive direction (i.e, toward positive infinity). The first kangaroo starts at location x_1 and moves at a rate of v_1 meters per jump. The second kangaroo starts at location x_2 and moves at a rate of v_2 meters per jump. Given the starting locations and movement rates for each kangaroo, can you determine if they'll ever land *at the same location at the same time*?

Input Format

A single line of four space-separated integers denoting the respective values of x_1, v_1, x_2, and v_2.

Constraints

- $0 \leq x_1 < x_2 \leq 10000$
- $1 \leq v_1 \leq 10000$
- $1 \leq v_2 \leq 10000$

Output Format

Print `YES` if they can land on the same location at the same time; otherwise, print `NO`.

Note: The two kangaroos must land at the same location *after making the same number of jumps*.

Sample Input 0

```
0 3 4 2
```

Sample Output 0

```
YES
```

Explanation 0

The two kangaroos jump through the following sequence of locations:

1. $0 \rightarrow 3 \rightarrow 6 \rightarrow 9 \rightarrow 12$
2. $4 \rightarrow 6 \rightarrow 8 \rightarrow 10 \rightarrow 12$

Thus, the kangaroos meet after 4 jumps and we print *YES*.

Sample Input 1

```
0 2 5 3
```

Sample Output 1

```
NO
```

Explanation 1

The second kangaroo has a starting location that is ahead (further to the right) of the first kangaroo's starting location (i.e., $x_2 > x_1$). Because the second kangaroo moves at a faster rate (meaning $v_2 > v_1$) *and* is already ahead of the first kangaroo, the first kangaroo will never be able to catch up. Thus, we print *NO*.

Submissions:111813

Max Score:10

Difficulty: Easy

Rate This Challenge:

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Current Buffer (saved locally, editable) Java 7

```
import java.io.*;
import java.util.*;
import java.text.*;
import java.math.*;
import java.util.regex.*;

public class Solution {

    static String kangaroo(int x1, int v1, int x2, int v2) { //0,3,4,2
        // Complete this function
        if(x1 == x2 && v1 == v2){
            return "YES";
        }else if(x1 > x2 && v1 < v2){
            do{
                x1 += v1;
                x2 += v2;
                if(x1 == x2) return "YES";
            }while(x1 > x2);
            return "NO";
        }else if(x1 < x2 && v1 > v2){
            do{
                x1 += v1;
                x2 += v2;
                if(x1 == x2) return "YES";
            }while(x1 < x2);
            return "NO";
        }else{
            return "NO";
        }
    }

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        int x1 = in.nextInt();
        int v1 = in.nextInt();
        int x2 = in.nextInt();
        int v2 = in.nextInt();
        String result = kangaroo(x1, v1, x2, v2);
        System.out.println(result);
    }
}

```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code