Kangaroo

Problem	Submissions	Leaderboard	Discussions

You are choreographing a circus show with various animals. For one act, you are given two kangaroos on a number line ready to jump in the positive direction (i.e, toward positive infinity).

- The first kangaroo starts at location $x1$ and moves at a rate of $v1$ meters per jump.

- The second kangaroo starts at location $x2$ and moves at a rate of $v2$ meters per jump.

You have to figure out a way to get both kangaroos at the same location at the same time as part of the show. If it is possible, return `YES`, otherwise return `NO`.

For example, kangaroo 1 starts at $x1 = 2$ with a jump distance $v1 = 1$ and kangaroo 2 starts at $x2 = 1$ with a jump distance of $v2 = 2$. After one jump, they are both at $x = 3$, ($x1 + v1 = 2 + 1$, $x2 + v2 = 1 + 2$), so our answer is `YES`.

Function Description

Complete the function *kangaroo* in the editor below. It should return `YES` if they reach the same position at the same time, or `NO` if they don't.

kangaroo has the following parameter(s):

- *x1, v1*: integers, starting position and jump distance for kangaroo 1

- *x2, v2*: integers, starting position and jump distance for kangaroo 2

Input Format

A single line of four space-separated integers denoting the respective values of $x1$, $v1$, $x2$, and $v2$.

Constraints

- $0 \leq x1 < x2 \leq 10000$

- $1 \leq v1 \leq 10000$

- $1 \leq v2 \leq 10000$

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*.
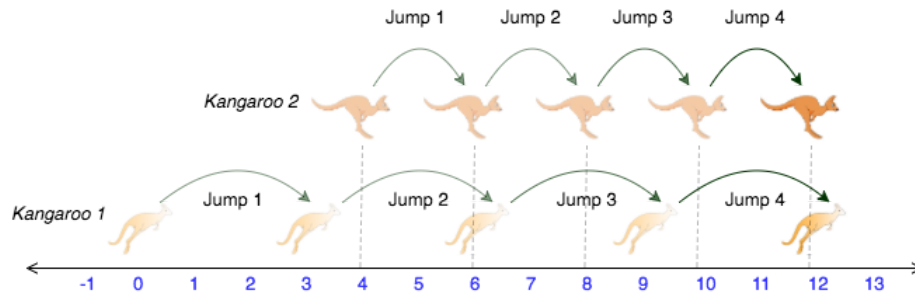
Sample Input 0

```
0 3 4 2
```

Sample Output 0

```
YES
```

Explanation 0

The two kangaroos jump through the following sequence of locations:

From the image, it is clear that the kangaroos meet at the same location (number 12 on the number line) after same number of jumps (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*.

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Contest ends in 3 hours

Submissions: 292
Max Score: 25
Difficulty: Easy

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```cpp
1 ▼ #include <bits/stdc++.h>
2
3   using namespace std;
4
5   vector<string> split_string(string);
6
7   // Complete the kangaroo function below.
8 ▶ string kangaroo(int x1, int v1, int x2, int v2) {⊕}
12
13  int main()
14 ▶ {⊕}
38
39 ▶ vector<string> split_string(string input_string) {⊕}
67
```

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