Bifröst

Heimdall is planning to make his yearly journey along *Bifröst*, the rainbow path to the heavens. The path consists of k cities, and consecutive cities in the path are connected by *bridges*. Each bridge is a certain colour, denoted by a non-negative integer between 0 and 5 000 inclusive. The $k-1$ bridges are numbered 1 to $k-1$ from left to right and the ith bridge is coloured c_i.

Heimdall's journey starts in the leftmost city and ends in rightmost city, possibly revisiting some cities more than once. In total, he crossed bridges A times. The ith bridge he crossed was coloured a_i, and he wrote this down in his notebook.

For example, if there were $k = 8$ cities and the bridges were coloured $1, 3, 2, 3, 4, 4, 5$, then the colours written in his notebook could be:

- $1, 3, 2, 3, 4, 4, 5$.
- $1, 3, 3, 1, 1, 3, 2, 3, 4, 4, 5$.
- $1, 3, 2, 3, 4, 4, 4, 4, 3, 3, 4, 4, 5, 5, 5$.

These are shown in the figure below.

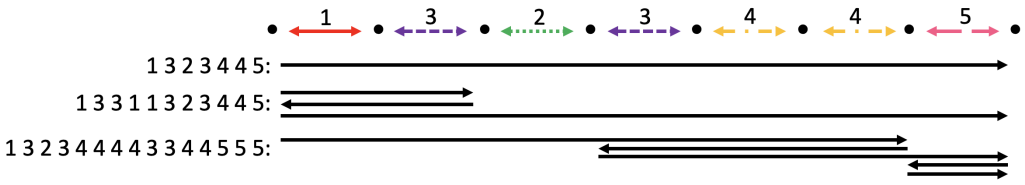

Figure 1: Three possible journeys. The colour of each bridge is written above it.

This year, Loki also made a journey from the leftmost city to the rightmost city. In total, he crossed bridges B times, the ith one coloured b_i. He wrote this down in his notebook too.

Heimdall thinks Loki might be lying, so he has asked you to determine if there is any integer k and sequence $c_1, c_2, \ldots, c_{k-1}$ that agrees with both his and Loki's notebooks.

Subtasks and Constraints

For all subtasks:

- $1 \leq A, B \leq 5\,000$.
- $0 \leq a_i, b_i \leq 5\,000$ for all i.

Additional constraints for each subtask are given below.

Subtask	Points	Additional constraints
1	6	$a_i = 0$ and $b_i = 0$ for all i.
2	10	Each colour appears at most once in Heimdall's notebook.
3	16	Each colour (except 0) appears at most once in Heimdall's notebook.
4	17	$A, B \leq 15$
5	34	$A, B \leq 100$
6	17	$A, B \leq 5000$

Input

- The first line of input contains the two integers A and B.
- The second line contains A integers $a_1, a_2, \ldots, a_A$.
- The third line contains B integers $b_1, b_2, \ldots, b_B$.

Output

If there is no sequence that agrees with both Heimdall and Loki's notebooks, output the single line `IMPOSSIBLE`.

Otherwise, output two lines:

- On the first line, print k, the number of cities. Your choice of k must be at most 5001.
- On the second line, print the $k-1$ integers $c_1, c_2, \ldots, c_{k-1}$.

If there are multiple correct sequences, you can print any of them. You **do not** need to minimize nor maximize k.

Sample Input 1

```
11 15
1 3 3 1 1 3 2 3 4 4 5
1 3 2 3 4 4 4 4 3 3 4 4 5 5 5
```

Sample Output 1

```
8
1 3 2 3 4 4 5
```

Sample Input 2

```
4 3
5 0 0 3
5 0 3
```

Sample Output 2

```
IMPOSSIBLE
```

Explanation

Sample Input 1 corresponds to the case shown in Figure 1. One possible solution has $k = 8$ cities, with the $k - 1$ bridges coloured $1, 3, 2, 3, 4, 4, 5$ from left to right. Then, Heimdall could have taken the following journey:

- He began by walking right along bridge 1 (with colour 1),
- He then walked right along bridge 2 (with colour 3),
- He then walked left along bridge 2 (with colour 3),
- He then walked left along bridge 1 (with colour 1),
- He then walked right along bridge 1 (with colour 1),
- He then walked right along bridge 2 (with colour 3),
- He then walked right along bridge 3 (with colour 2),
- He then walked right along bridge 4 (with colour 3),
- He then walked right along bridge 5 (with colour 4),
- He then walked right along bridge 6 (with colour 4),
- He then walked right along bridge 7 (with colour 5), finishing his journey.

Loki could have taken the following journey:

- He began by walking right along bridge 1 (with colour 1),
- He then walked right along bridge 2 (with colour 3),
- He then walked right along bridge 3 (with colour 2),
- He then walked right along bridge 4 (with colour 3),
- He then walked right along bridge 5 (with colour 4),
- He then walked right along bridge 6 (with colour 4),
- He then walked left along bridge 6 (with colour 4),
- He then walked left along bridge 5 (with colour 4),
- He then walked left along bridge 4 (with colour 3),
- He then walked right along bridge 4 (with colour 3),
- He then walked right along bridge 5 (with colour 4),
- He then walked right along bridge 6 (with colour 4),
- He then walked right along bridge 7 (with colour 5),
- He then walked left along bridge 7 (with colour 5),
- He then walked right along bridge 7 (with colour 5), finishing his journey.

In Sample Input 2, there is no sequence that agrees with both Heimdall and Loki's notebooks.