Mixing Madness

You run a paint shop that exclusively sells various shades of blue paint, and have just received a shipment of N cans of blue paint (numbered from 1 to N). The ith can has paint with an integer shade s_i.

To comply with government regulations, your shop can only sell K different shades of blue paint, the ith of which is the integer shade p_i. Unfortunately, the shipment that you just received may contain shades of blue that your shop cannot sell.

To fix this, using the order of the cans in the shipment, you are going to mix the new cans into shades that you can sell. In particular, you are going to do the following exactly once:

1. Split your N cans into one or more contiguous ranges. Every can must be included in exactly one range.
2. Mix each range of cans together. When you mix a range of cans, the shade formed is the mean[1] of the shades of the cans that were mixed.

Note that it is possible to create paint with a non-integer shade, however these can never be sold because all government allowed shades are integers.

You must find a sequence of contiguous ranges such that, when each range is mixed, the shades formed are exclusively shades that you can sell, or determine that no such sequence exists. Partial marks will be awarded for just determining whether such a sequence exists. See the scoring section for details.

Subtasks and Constraints

For all subtasks:

- $1 \leq N \leq 200\,000$.
- $1 \leq K \leq 10$.
- $0 \leq s_i, p_i \leq 10\,000$ for all i.

Additional constraints for each subtask are given below.

Subtask	Points	Additional constraints
1	25	$N \leq 200$.
2	15	$N \leq 5000$.
3	30	$s_i \leq s_{i+1}$ for all $1 \leq i \leq N-1$.
4	30	No additional constraints.

Input

- The first line of input contains the integer N.
- The second line of input contains N integers describing the shades of paint in the shipment. They are $s_1, s_2, \ldots, s_N$.
- The third line of input contains the integer K.
- The fourth line of input contains K integers describing the shades of paint that your shop can sell. They are $p_1, p_2, \ldots, p_K$.

[1]The *mean* is the sum of the values divided by the number of values. For example, the mean of $[3, 5, 4, 8]$ is $\frac{3+5+4+8}{4} = \frac{20}{4} = 5$.

Output

If there does not exist a sequence of contiguous ranges such that, when each range is mixed, the shades formed are exclusively shades that you can sell, your program must output `IMPOSSIBLE`.

Otherwise, your program must output a sequence of contiguous ranges which satisfies the requirements above.

- On the first line, your program must output `POSSIBLE`.
- On the second line, your program must output the number of ranges in your sequence (call this M).
- On the following M lines, your program must output the ranges. The ith line should contain two integers l_i and r_i, indicating that mixing the paint cans with shades $p_{l_i}, p_{l_i+1}, \ldots, p_{r_i}$ will form a paint can with a shade that your shop can sell. The ranges must be outputted in ascending order. In particular:
  - Your first range must satisfy $l_1 = 1$.
  - Your last range must satisfy $r_M = N$.
  - For each range i ($1 \leq i < M$), it must hold that $l_{i+1} = r_i + 1$.

If there are multiple possible solutions, you may output any of them.

Scoring

You will receive 70% for just determining whether or not a sequence of contiguous ranges which satisfies the requirements above exists. In particular:

- If your output is correct, you will receive 100% for that test case. Otherwise,
- If the correct first line of output is `POSSIBLE` and your first line of output is `IMPOSSIBLE`, you will receive 0% for that test case. Otherwise,
- If the correct first line of output is `IMPOSSIBLE` and your output is `POSSIBLE`, you will receive 0% for that test case. Otherwise,
- You will receive 70% for that test case.

Your score for a subtask will be the **minimum** score of all test cases in the subtask, multiplied by the number of points you can score in the subtask.

Sample Input 1

```
6
6 1 2 3 8 4
3
2 8 6
```

Sample Output 1

```
POSSIBLE
3
1 1
2 4
5 6
```

Sample Input 2

```
6
2 7 5 3 1 4
2
1 10
```

Sample Output 2

```
IMPOSSIBLE
```

Explanation

In the first sample case, the mixing of the ranges in the sample output is illustrated below:

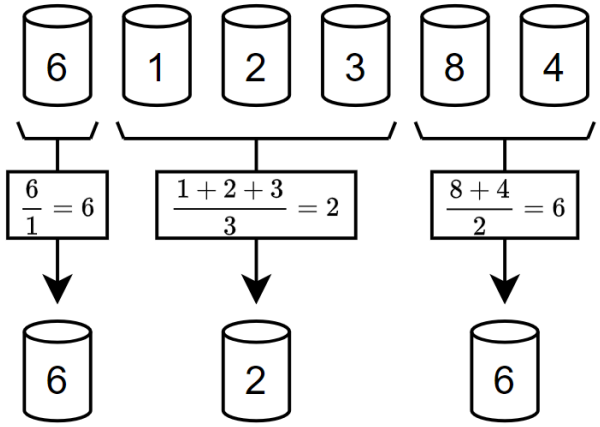

Figure 1: Sample Case 1

Note that there may exist other possible sequences of ranges.

In the second sample case, there is no sequence of ranges such that, when each range is mixed, the shades formed are exclusively shades that you can sell.