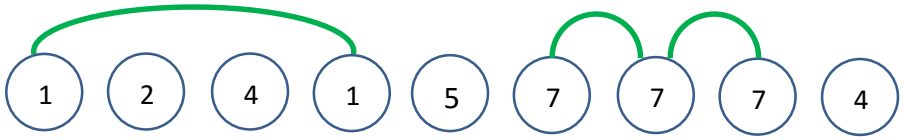
Problem 2 – Non-Crossing Bridges

You are given a sequence **seq** of integer numbers. Any two equal numbers can be connected by a **bridge**. Your task is to place as many **non-crossing bridges** as possible between the numbers.

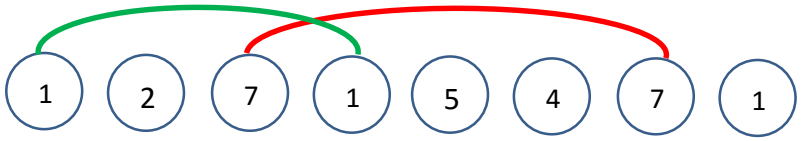
Bridges should be **non-crossing**: they **cannot overlap** and **cannot be inside one another**. It is allowed, however, that one number is shared between two bridges.

Valid (non-crossing) bridges:



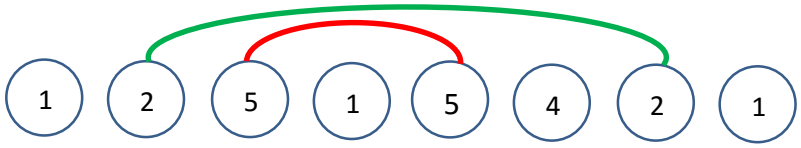
Connected bridges: {1 - 1}, {7 - 7}, {7 - 7}

Invalid bridges (crossing each other):



Connected bridges: {1 - 1}. Bridge {7 - 7} is not allowed.

Invalid bridges (one inside the other):



Connected bridges: {2 - 2}. Bridge {5 - 5} is not allowed.

Input

On the single input line you are given the sequence **seq** holding integers separated by space.

Output

- At the **first line** print the **maximal number of non-crossing bridges**.
  - If no bridges can be placed in the sequence, print "**No bridges found**".
  - Print "**X bridge(s) found**" at the **first line** where **X** is the maximal number of bridges.
  - Print "**bridge**" for one bridge and "**bridges**" (plural) for more than one bridge.
- Print **the bridges** that form the best solution at the **second line**.
  - In the input sequence replace with "**X**" all numbers that do not take part in the solution and leave the numbers that take part in bridges.
  - If **several maximal solutions** exist, print the **bridges that end as early as possible**.
  - **Example**: the sequence {2 **1** 3 **1** 2 3 **4** 5 **4** 5} we have multiple configurations having the same maximal number of 2 bridges. We first print the **bridge that ends as early as possible** {1 - 1}, then the next bridge on the right **that ends as early as possible** {4 - 4}. The expected result is: {X **1** X **1** X X **4** X **4** X}.

Constraints

- The length of **seq** is in the range **[1 … 10 000]**. All numbers are integers in range [**-100 000 … 100 000**].
- Time limit: **100 ms**. Allowed memory: **16 MB**.

Sample Input / Output

Input	Output
7 3 4 5 3 6 7 2 4 5 6 8 6 8	3 bridges found X 3 X X 3 6 X X X X 6 X 6 X
2 1 3 1 2 3 4 5 4 5	2 bridges found X 1 X 1 X X 4 X 4 X
1 2 3 1 2 3	1 bridge found 1 X X 1 X X
1 2 3 3 2 1	1 bridge found X X 3 3 X X
42 3 2 1	No bridges found X X X X