Run-length encoding

Mouse Stofl wants to memorize a long sequence of numbers. The sequence contains many repeated numbers, hence Stofl developed a special technique to make the sequence easier to memorize.

If there are k adjacent occurrences of the number x in the sequence, Stofl simply memorizes the two numbers x and k. This is also called a run-length encoding.

The computation of the run-length encoding is a lot of work for Stofl. He therefore asks you to write a program that computed the encoding for him.

Input

The first line contains an integer N, the length of the sequence $(a_i)_i$. The second line contains the N numbers a_i.

Output

Let M be the number of pairs (x_i, k_i) Stofl memorizes. Print M lines each containing one pair (x_i, k_i).

You should minimize the number M as Stofl dislikes memorizing long sequences.

Limits

In all test groups $1 \leq N$ and $1 \leq a_i \leq 10^9$.

- In the first test group (20 points) $N \leq 10$.
- In the second test group (40 points) $n \leq 1\,000$.
- In the third test group (40 points) $n \leq 10^6$.

Examples

Input	Output
7 7 7 1 2 3 3 3	7 2 1 1 2 1 3 3

Input	Output
15 1 2 3 4 3 4 4 4 4 3 3 3 2 2 9	1 1 2 1 3 1 4 1 3 1 4 4 3 3 2 2 9 1