

## 1421 – Wavio Sequence

Wavio is a sequence of integers. It has some interesting properties:

1. Wavio is of odd length i.e.  $L = 2*n + 1$ .
2. The first  $(n+1)$  integers of Wavio sequence make a strictly increasing sequence.
3. The last  $(n+1)$  integers of Wavio sequence make a strictly decreasing sequence.
4. No two adjacent integers are same in a Wavio sequence.

For example 1, 2, 3, 4, 5, 4, 3, 2, 1 is an Wavio sequence of length 9. But 1, 2, 3, 4, 5, 4, 3, 2, 2 is not a valid wavio sequence. In this problem, you will be given a sequence of integers. You have to find the length of the longest Wavio sequence which is a **subsequence** of the given sequence. Consider the given sequence as:

1 2 3 2 1 2 3 4 3 2 1 5 4 1 2 3 2 2 1

Here the longest Wavio sequence is: 1 2 3 4 5 4 3 2 1. So, the output will be 9.

### Input

Input starts with an integer  $T$  ( $\leq 12$ ), denoting the number of test cases.

Each case starts with a line containing an integer  $N$  ( $1 \leq N \leq 10^5$ ) denoting the number of elements in the sequence. The next line contains  $N$  space separated integers between  $-10^8$  to  $10^8$ , that form the sequence.

### Output

For each case, print the case number and the length of the maximum possible Wavio sequence.

| Sample Input                | Output for Sample Input |
|-----------------------------|-------------------------|
| 3                           | Case 1: 9               |
| 10                          | Case 2: 7               |
| 1 2 3 4 5 4 3 2 1 10        | Case 3: 1               |
| 14                          |                         |
| 1 2 3 2 1 2 3 4 3 2 1 5 4 1 |                         |
| 5                           |                         |
| 1 2 3 4 5                   |                         |

### Note

Dataset is huge, use faster I/O methods.