Longest Zig-Zag Subsequence

Filename: zigzag

A sequence of numbers is called a zig-zag sequence if the differences between successive numbers strictly alternate between positive and negative. The first difference (if one exists) may be either positive or negative. A sequence with fewer than two elements is trivially a zig-zag sequence. For example, 1,7,4,9,2,5 is a zig-zag sequence because the differences (6,-3,5,-7,3) are alternately positive and negative. In contrast, 1,4,7,2,5 and 1,7,4,5,5 are not zig-zag sequences, the first because its first two differences are positive and the second because its last difference is zero. Given a sequence of integers, sequence, calculate the length of the longest subsequence of sequence that is a zig-zag sequence. A subsequence is obtained by deleting some number of elements (possibly zero) from the original sequence, leaving the remaining elements in their original order.

The Input:

First line of the input contains T the number of test cases. First line of each test case contains N the number of integers in the sequence. Second line contains N integers separated by a single space. N is between 1 and 50 inclusive. Each of the integers in the sequence will fit into signed 32 bit integers.

The Output:

For each test case output the length of the longest subsequence of the input sequence that is a zig-zag sequence.

Sample Input	Sample Output
8 6 1 7 4 9 2 5 10 1 17 5 10 13 15 10 5 16 8 2 10 20 2 20 10 2 20 20 1 44 9 1 2 3 4 5 6 7 8 9 9 10 9 8 7 6 7 8 9 10	6 7 2 2 1 1 2 3