A sequence of numbers is called a **wiggle 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 wiggle sequence.

For example, [1,7,4,9,2,5] is a wiggle 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 wiggle sequences, the first because its first two differences are positive and the second because its last difference is zero.

Given a sequence of integers, return the length of the longest subsequence that is a wiggle sequence. A subsequence is obtained by deleting some number of elements (eventually, also zero) from the original sequence, leaving the remaining elements in their original order.

**Example 1:**

**Input:** [1,7,4,9,2,5]

**Output:** 6

**Explanation:** The entire sequence is a wiggle sequence.

**Example 2:**

**Input:** [1,17,5,10,13,15,10,5,16,8]

**Output:** 7

**Explanation:** There are several subsequences that achieve this length. One is [1,17,10,13,10,16,8].

**Example 3:**

**Input:** [1,2,3,4,5,6,7,8,9]

**Output:** 2

**Follow up:**  
Can you do it in O(*n*) time?