**Longest Wiggle Subsequence**

**Difficulty:** Hard

**Scenario**

Imagine you are working with a sequence of stock prices over a period of days. To determine the most volatile sequence of price changes, you want to identify the longest subsequence where the differences between successive prices strictly alternate between positive and negative. This will help you analyze the market's fluctuations more effectively.

A wiggle sequence is defined as a sequence where the differences between successive numbers strictly alternate between positive and negative. For instance, a sequence with differences [6, -3, 5, -7, 3] is a wiggle sequence.

Your task is to determine the length of the longest wiggle subsequence in a given sequence of integers representing stock prices.

**Problem Statement**

Given an integer array nums, return the length of the longest wiggle subsequence of nums.

**Input Format**

* The first line contains an integer n, the number of elements in the array.
* The second line contains n space-separated integers representing the array nums.

**Output Format**

* Print a single integer representing the length of the longest wiggle subsequence.

**Constraints**

* 1≤nums.length≤10001 \leq \text{nums.length} \leq 10001≤nums.length≤1000
* 0≤nums[i]≤10000 \leq \text{nums[i]} \leq 10000≤nums[i]≤1000

**Example 1**

**Input:**

Copy code

6

1 7 4 9 2 5

**Output:**

Copy code

6

**Explanation:**

* The entire sequence is a wiggle sequence with differences (6, -3, 5, -7, 3).

**Example 2**

**Input:**

Copy code

10

1 17 5 10 13 15 10 5 16 8

**Output:**

Copy code

7

**Explanation:**

* There are several subsequences that achieve this length. One such subsequence is [1, 17, 10, 13, 10, 16, 8] with differences (16, -7, 3, -3, 6, -8).

**Example 3**

**Input:**

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9

1 2 3 4 5 6 7 8 9

**Output:**

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2

**Explanation:**

* The longest wiggle subsequence is [1, 2] or any two consecutive numbers as the sequence only increases.

**Additional Test Cases**

**Test Case 1**

**Input:**

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5

3 3 3 2 5

**Output:**

Copy code

3

**Explanation:**

* One possible wiggle subsequence is [3, 2, 5] with differences (-1, 3).

**Test Case 2**

**Input:**

Copy code

7

10 20 10 20 10 20 10

**Output:**

Copy code

7

**Explanation:**

* The entire sequence is a wiggle sequence with differences (10, -10, 10, -10, 10, -10).

**Test Case 3**

**Input:**

Copy code

6

1 2 1 2 1 2

**Output:**

Copy code

6

**Explanation:**

* The entire sequence is a wiggle sequence with differences (1, -1, 1, -1, 1).

**Test Case 4**

**Input:**

Copy code

1

5

**Output:**

Copy code

1

**Explanation:**

* A single element is trivially a wiggle sequence.

These test cases ensure coverage of various scenarios, including single elements, strictly increasing sequences, and sequences with repeated elements