Algorithms Lab Internal Assessment-1

2 Questions [2*10=20 Marks] Time : 3:00PM to 4:15PM

1. Write a program to implement Wiggle Subsequence:
   A wiggle sequence is a sequence where 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 two or fewer 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) alternate between positive and negative.
   In contrast, [1, 4, 7, 2, 5] and [1, 7, 4, 5, 5] are not wiggle sequences. The first is not because its first two differences are positive, and the second is not because its last difference is zero.

   A subsequence is obtained by deleting some elements (possibly zero) from the original sequence, leaving the remaining elements in their original order.

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

   Example 1:

   Input: nums = [1,7,4,9,2,5]
   Output: 6
   Explanation: The entire sequence is a wiggle sequence with differences (6, -3, 5, -7, 3).

   Example 2:

   Input: nums = [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] with differences (16, -7, 3, -3, 6, -8).

   Constraints:

   1 <= nums.length <= 1000
   0 <= nums[i] <= 1000
   Follow up: Could you solve this in O(n) time?

2. Write a program to implement Different Ways to Add Parentheses?
   Given a string expression of numbers and operators, return all possible results from computing all the different possible ways to group numbers and operators. You may return the answer in any order.

   Example :

   Input: expression = "2*3-4*5"
   Output: [-34,-14,-10,-10,10]
   Explanation:
   (2*(3-(4*5))) = -34
   ((2*3)-(4*5)) = -14
   ((2*(3-4))*5) = -10
   (2*((3-4)*5)) = -10
   (((2*3)-4)*5) = 10

   Constraints:

   1 <= expression.length <= 20
   expression consists of digits and the operator '+', '-', and '*'.