Solve the problems using Python

1. Today potatoes price are change day by day. Let a salesman will purchase it on some day and sell it on other day. Let us consider for a week price of potato are 100, 200, 300, 80, 30, 200, 250 meaning is that day1 price 100, day2 price is 200 and so on. You have found out on which day salesman will buy and sell the potato so that for a week his profit is maximum. In the above case salesman will buy on day1 and sell it on day3, buy on day 5 and sell it on day 7. (Consider Number of days may be 2 to 30.)

2. Consider a string contains any characters of length. If two consecutive characters is same, they are called 2- neighbour, if 3 consecutive characters are same they are called 3- neighbour and so on. You have to find out a neighbour of maximum size in length.

3. Insert an element in all position of a list.
Example Insert 10 in a list [1,2,3]
output: [[10,1,2,3], [1,10,2,3], [1,2,10,3], [1,2,3,10]]

4. You are given a sequence of number A_1, A_2, ..., A_N. For each valid i, the star value of the element A_i is the number of valid indices $j<i$ such that A_j is divisible by A_i. Calculate the maximum star value of a given sequence.

5. A permutation p_1, p_2, ..., p_N of {1, 2, ..., N} is beautiful if $p_i\&(p_i+1)$ is greater than 0 for every $1\leq i<N$. You are given an integer N, and your task is to construct a beautiful permutation of length N or determine that it's impossible.
*a&b denotes the bitwise AND of a and b.
Beautiful permutation of 3 and 5.
1 3 2
2 3 1 5 4
If N=4 it is not possible