Problem I: Investors

Time limit: 4s, memory limit: 1GB.

The year is 2087. Artificial Intelligence has solved even those hypergraph colouring problems that had never been posed, while the completed Hyperloop network turned out to be the slowest subway in the world. The software developed in Problem H has been working flawlessly for the past 10 years, but (as always) the sociological aspect turned out to be the weakest link of the plan: whenever the system proposed a Hyperloop route involving the longest possible connections, the blood pressure of a passenger looking at the itinerary was rising so much that they no longer had to buy Melon's coffee at inflated prices.

In order to calm down the investors, Usk decided to present the company's financial results. Unfortunately, they were not too impressive because of low ticket revenues and high coffee purchasing costs. The eccentric billionaire decided to "tweak" them a bit.

The company's results can be represented as a sequence of n numbers denoting the revenue for the following months. In order not to arouse suspicions, Usk decided to increase the numbers on a chosen contiguous interval of the sequence by some positive integer. Performing this operation once fell short of the visionary's expectations. So he tried a second time, and a third... Ultimately, he decided that he would like to perform at most k operations of increasing the results (possibly by different values).

Usk knows that investors are looking primarily at the growth of the company's revenues, while they do not like when the revenues drop compared to previously achieved results. Therefore, he would like to minimise the number of inversions [1] among his financial results. Are you able to save the future of his company?

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 400$). The descriptions of the test cases follow.

In the first line of the test case there are two integers n, k ($1 \leqslant n \leqslant 6000$, $0 \leqslant k \leqslant n$).

In the second line there is a sequence of numbers $a_1, a_2, ..., a_n$ ($0 \leqslant a_i \leqslant 10^9$), denoting the financial results of Melon's company.

The sum of n among all test cases does not exceed 6000.

Output

For each test case, output exactly one integer – the minimum number of inversions in the sequence after applying an operation of increasing a contiguous interval no more than k times.

[1] As a reminder, given a sequence $a_1, a_2, ..., a_n$, an inversion is a pair of indices i, j such that $i < j$ and $a_i > a_j$.

Example

For an example input:	The correct output is:
2 6 1 4 5 6 2 2 1 6 2 4 5 6 2 2 1	2 0