B. K-Sort

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given an array of integers a of length n.

You can apply the following operation any number of times (maybe, zero):

- First, choose an integer k such that $1 \le k \le n$ and pay $k + 1$ coins.
- Then, choose **exactly** k indices such that $1 \le i_1 < i_2 < \ldots < i_k \le n$.
- Then, for each x from 1 to k, increase a_{i_x} by 1.

Find the minimum number of coins needed to make a non-decreasing. That is, $a_1 \le a_2 \le \ldots \le a_n$.

Input

Each test contains multiple test cases. The first line of input contains a single integer t ($1 \le t \le 10^4$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \le n \le 10^5$) — the length of the array a.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$) — the elements of the array a.

It is guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case, output a single integer — the minimum number of coins needed to make a non-decreasing.

Example

input Copy

```
5
3
1 7 9
5
2 1 4 7 6
4
1 3 2 4
1
179
9
344 12 37 60 311 613 365 328 675
```

output Copy

```
0
3
2
0
1821
```

Note

In the first test case, a is already sorted, so you don't have to spend any coins.

In the second test case, the optimal sequence of operations is:

- Choose $k = 2$ and the indices 2 and 5: $[2, 1, 4, 7, 6] \to [2, 2, 4, 7, 7]$. This costs 3 coins.

It can be proven that it is not possible to make a non-decreasing by spending less than 3 coins.

EPIC Institute of Technology Round Summer 2024 (Div. 1 + Div. 2)

Finished

→ **Virtual participation**

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ **Problem tags**

greedy *1000

No tag edit access

→ **Contest materials**

- Announcement (en)
- Video Tutorial (en)
- Tutorial #2 (en)