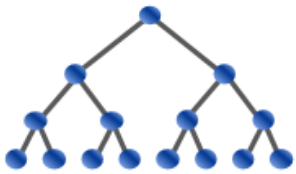

USACO 2022 JANUARY CONTEST, SILVER
PROBLEM 2. COW FRISBEE

Return to Problem List

Contest has ended.

Analysis mode

English (en)

Farmer John's N cows ($N \leq 3 \times 10^5$) have heights $1, 2, \ldots, N$. One day, the cows are standing in a line in some order playing frisbee; let $h_1 \ldots h_N$ denote the heights of the cows in this order (so the h's are a permutation of $1 \ldots N$).

Two cows at positions i and j in the line can successfully throw the frisbee back and forth if and only if every cow between them has height lower than $\min(h_i, h_j)$.

Please compute the sum of distances between all pairs of locations $i < j$ at which there resides a pair of cows that can successfully throw the frisbee back and forth. The distance between locations i and j is $j - i + 1$.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line of input contains a single integer N. The next line of input contains $h_1 \ldots h_N$, separated by spaces.

OUTPUT FORMAT (print output to the terminal / stdout):

Output the sum of distances of all pairs of locations at which there are cows that can throw the frisbee back and forth. Note that the large size of integers involved in this problem may require the use of 64-bit integer data types (e.g., a "long long" in C/C++).

SAMPLE INPUT:

```
7
4 3 1 2 5 6 7
```

SAMPLE OUTPUT:

```
24
```

The pairs of successful locations in this example are as follows:

```
(1, 2), (1, 5), (2, 3), (2, 4), (2, 5), (3, 4), (4, 5), (5, 6), (6, 7)
```

SCORING

- Test cases 1-3 satisfy $N \leq 5000$.
- Test cases 4-11 satisfy no additional constraints.

Problem credits: Quanquan Liu

Language: C

Source File: Choose File No file chosen

Submit Solution

Note: Many issues (e.g., uninitialized variables, out-of-bounds memory access) can cause a program to produce different output when run multiple times; if your program behaves in a manner inconsistent with the official contest results, you should probably look for one of these issues. Timing can also differ slightly from run to run, so it is possible for a program timing out in the official results to occasionally run just under the time limit in analysis mode, and vice versa. Note also that we have recently changed grading servers, and since our new servers run at different speeds from the servers used during older contests, timing results for older contest problems may be slightly off until we manage to re-calibrate everything properly.

Previous In-Contest Submissions:

Mon, Jan 31, 2022 23:01:19 EST (C++17)