



USACO 2022 JANUARY CONTEST, SILVER PROBLEM 2. COW FRISBEE

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English (en) ▼

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

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 $h_1 \dots h_N$, 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

Contest has ended. No further submissions allowed.