The Number of Inversions

(inversion.cpp/c)

Time Limit： 1 sec ， Memory Limit： 131072 KB

For a given sequence $A = \{a_0, a_1, \ldots a_{n-1}\}$, the number of pairs (i, j) where $a_i > a_j$ and $i < j$, is called the number of inversions. The number of inversions is equal to the number of swaps of Bubble Sort defined in the following program:

```
bubbleSort(A)
  cnt = 0 // the number of inversions
  for i = 0 to A.length-1
    for j = A.length-1 downto i+1
      if A[j] < A[j-1]
        swap(A[j], A[j-1])
        cnt++

  return cnt
```

For the given sequence A, print the number of inversions of A. Note that you should not use the above program, which brings Time Limit Exceeded.

Input (inversion.in)

In the first line, an integer n, the number of elements in A, is given. In the second line, the elements a_i ($i = 0, 1, .. n - 1$) are given separated by space characters.

output (inversion.out)

Print the number of inversions in a line.

Constraints

- $1 \leq n \leq 200,000$
- $0 \leq a_i \leq 10^9$
- a_i are all different

Sample Input 1

```
5
3 5 2 1 4
```

Sample Output 1

```
6
```

Sample Input 2

```
3
3 1 2
```

Sample Output 2

```
2
```