

5. Implement the optimal algorithm for inversion counting in either C, C++, C#, Java, or Python. Be efficient and implement it in  $O(n \log n)$  time, where  $n$  is the number of elements in the ranking.

The input will start with an positive integer, giving the number of instances that follow. For each instance, there will be a positive integer, giving the number of elements in the ranking. A sample input is the following:

```
2
5
5 4 3 2 1
4
1 5 9 8
```

The sample input has two instances. The first instance has 5 elements and the second has 4. For each instance, your program should output the number of inversions on a separate line. Each output line should be terminated by a newline. The correct output to the sample input would be:

```
10
1
```