IT700 Lab Test 1 (17 Nov 2020)

Problem: We have seen that an *inversion* in a sequence A of numbers is a pair of indices (i,j) such that i < j and A[i] > A[j]. For e.g. the number of inversions in 1,3,9,8,5 is 3 while that in 4,10,8,2,1 is 8.

Let's now define a *b-inversion* as a pair of indices (i,j) such that i<j and A[i] > b.A[j]. For e.g. for b = 3 the sequence 1,3,9,8,5 has no *b-inversions* while 4,10,8,2,1 has 5 *b-inversions* corresponding to the pair of elements (4,1), (10,2), (10,1), (8,2) and (8,1).

Implement a ***O(nlogn)*** *algorithm* to count the total number of *b-inversions* in an input sequence. Read in an **input file** which is a test case. Each test case file has two lines only. The first line is the sequence of elements separated by space; the next line is the number b.

Sample Input 1:
4 10 8 2 1
3

Sample Output 1:
5

Sample Input 2:
12 7 3 6 1 4
2

Sample Output 2:
7

Sample Input 3:
1 3 9 8 5
3

Sample Output 3:
0