Power of Smurfberries

Smurfs living in the Smurf village love to eat the diving treat growing in Sarsaparilla trees known as "Smurfberries". Smurfberries are rare to find and give a special power to Smurfs.

There are only a limited n number of Sarsaparilla trees in Smurfland. At a given day, the number of Smurfberries in each tree is given as an array of n points $[x_1, x_2, \ldots, x_n]$.

For a given number of Smurfberries y, subsegements can be formed as $[y, x_1], [y, x_2], \ldots, [y, x_n]$ (including the start and end points). Note that if $x_i < y$, then the segment will look like $[x_i, y]$.The special power of a tree containing q number of berries is defined as the number of subsegments that include value q (denoted by P_q).

The magical equation to find the power of all trees are given by $\sum_{q=1}^{10^9} P_q$ for all $y \in \{x_1, x_2, \ldots, x_n\}$.

For example, if the number of Smurfberries are $[1, 4, 3]$ and we choose $y = 4$, then the subsegments are: $[1, 4], [4, 4], [3, 4]$. And the powers of the Smurfberry trees will be:

$$P_1 = 1, P_2 = 1, P_3 = 2, P_4 = 3, P_5 = 0, P_6 = 0, P_7 = 0, \ldots, P_{10^9} = 0$$

$$\text{The total power is } 1 + 1 + 2 + 3 = 7$$

Smurfette is the only female Smurf in the village full of smelly, blue male smurfs. As Smurfette was a creation of the evil wizard Gargamel, the Smurfs have a hard time trusting her. Papa Smurf advices that if she can solve the magical equation to find the power of all their smurfberries, the Smurfs will accept her as one of their own.

Help Smurfette to to compute $\sum_{q=1}^{10^9} P_q$ for all $y \in \{x_1, x_2, \ldots, x_n\}$ which would denote the total power of Smurfberries.

Input Format

The first line contains the number of test cases t.

The first line of each test case contains an integer n, the number of Sarsaparilla trees.

The second line contains n integers $x_1, x_2, \ldots, x_n$, the number of Smurfberries in each tree.

Constraints

$(1 \le t \le 10^4)$

$(1 \le n \le 2 \times 10^5)$

$(1 \le x_i \le 10^9)$

It is guaranteed that the sum of the values of n over all test cases does not exceed 2×10^5.

Output Format

For each test case, output n integers, where the ith integer is equal to the sum of special powers of all points for $y = x_i$.

Sample Input 0

```
3
3
1 4 3
5
1 2 5 7 1
4
1 10 100 1000
```

Sample Output 0

```
8 7 6
16 15 18 24 16
1111 1093 1093 2893
```