

BST maintenance

Consider a binary search tree T which is initially empty. Also, consider the first N positive integers $\{1, 2, 3, 4, 5, \dots, N\}$ and its permutation $P \{a_1, a_2, \dots, a_N\}$.

If we start adding these numbers to the binary search tree T , starting from a_1 , continuing with a_2, \dots (and so on) \dots , ending with a_N . After every addition we ask you to output the sum of distances between every pair of T 's nodes.

Input Format

The first line of the input consists of the single integer N , the size of the list.
The second line of the input contains N single space separated numbers the permutation a_1, a_2, \dots, a_N itself.

Constraints

$1 \leq N \leq 250000$

Output Format

Output N lines.
On the i^{th} line output the sum of distances between every pair of nodes after adding the first i numbers from the permutation to the binary search tree T

Sample Input #00

```

8
4 7 3 1 8 2 6 5

```

Sample Output #00

```

0
1
4
10
20
35
52
76

```

Explanation #00

After adding the first element, the distance is 0 as there is only 1 element

```

4

```

After adding the second element, the distance between 2 nodes is 1 .

```

4
 \
  7

```

After adding the third element, the distance between every pair of elements is $2+1+1=4$

```

  4
 / \
3   7

```

After adding the fourth element, the distance between every pair of elements is $3 + 2 + 1 + 2 + 1 + 1 = 10$



After adding the fifth element, the distance between every pair of elements is $4 + 3 + 2 + 1 + 3 + 2 + 1 + 2 + 1 + 1 = 20$



After adding the sixth element, the distance between every pair of elements is $5 + 4 + 3 + 2 + 1 + 4 + 3 + 2 + 1 + 3 + 2 + 1 + 2 + 1 + 1 = 35$



After adding the seventh element, the distance between every pair of elements is $5+5+4+3+2+1+4+4+3+2+1+3+3+2+1+2+2+1+1+1+2=52$



After adding the final element, the distance between every pair of elements is $6+5+5+4+3+2+1+5+4+4+3+2+1+4+3+3+2+1+3+2+2+1+2+1+1+2+1+3=76$

