DMPG '18 S4 - Mimi and Prize

Time limit: 1.0s **Memory limit:** 64M

A tree is a connected graph with N nodes and $N-1$ edges. An interesting property of trees is that there exists *exactly 1 path* between any two nodes.

As the top CS student in her year, Mimi's ICS teacher awards her a tree at graduation. The tree's nodes are labelled $1, 2, \ldots, N$, and the i^{th} node has a value, A_i. However, having scored only half a percentage point lower than her, you decide to contest this prize!

The teacher arranges a code-off on this tree: you are to determine the number of ordered pairs $\langle u, v \rangle$ such that the values on the path match the parity of the index. Specifically, if you took the path starting from u and ending at v and wrote it into an array with A_u as the first element and A_v as the last, then the j^{th} value of this array must be congruent to $j \bmod 2$, for every j from 1 to the size of the array. Note that this array is **1-indexed**.

Can you solve this problem and claim the title of top ICS student?

Constraints

For all subtasks:

$1 \leq A_i \leq 10^9$

Subtask 1 [10%]

$1 \leq N \leq 500$

Subtask 2 [10%]

$1 \leq N \leq 2\,000$

Subtask 3 [80%]

$1 \leq N \leq 200\,000$

Input Specification

The first line of input will contain N, the number of nodes in the tree.
The next line of input will contain N space separated integers, $A_1, A_2, \ldots, A_N$.
The next $N-1$ lines of input will each contain a pair of integers, a_i b_i, indicating that there is an edge between a_i and b_i.

Output Specification

A single integer, the number of ordered pairs which satisfy the given condition.

Sample Input

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

Sample Output

```
8
```