

Back To School '18: Beautiful Trees

Junji has found a beautiful tree lying on the ground, and he wants to take it home to beautify his house. However, he only plans on taking a segment of the tree because he has aichmophobia and too many branches scares him.

The tree has N connection points. Each connection point has a *strength*, y_i . A *good* segment is a segment of the tree where every connection point on the segment has a *strength* that has a solution to $x^2 + x = y_i$ for some **integer** x . A segment of the tree is a path of tree where every connection point is used at most once. Junji wants the **longest good** segment to bring home to beautify his house. Note that the **longest good** segment *may* be the entire tree, in which case he will take the entire tree home.

Input Specification

The first line will contain the integer N ($1 \leq N \leq 10^5$), the number of connection points.

The second line will contain N integers, y_1, y_2, \dots, y_N ($1 \leq y_i \leq 10^{16}$), the *strength* of each connection point.

The next $N - 1$ lines will each contain two integers a, b ($1 \leq a, b \leq N$), meaning that connection point a and connection point b are connected by a single branch.

It is guaranteed that there is exactly one path between any two connection points.

Output Specification

Output the number of connection points in the **longest good** segment in the tree.

Subtasks

Subtask 1 [10%]

All connection points satisfy the constraint $x^2 + x = y_i$ for some integer x .

Subtask 2 [20%]

$$y_i \leq 10^6$$

Subtask 3 [70%]

No further constraints.

Sample Input 1

```
7
6 2 30 20 90 42 2
1 2
2 3
3 4
3 5
2 6
2 7
```

Sample Output 1

```
4
```

Sample Input 2

```
8
2 99999999900000000 3 3 3 3 3 1
1 2
1 3
3 4
4 5
3 6
2 7
2 8
```

Sample Output 2

```
2
```