

Back To School '18: Trucking Troubles II

Time limit: 1.0s **Memory limit:** 256M
Java: 1.8s

Yi is one of many hardworking truck drivers in a mysterious land. In this mysterious land, there are N villages connected by $N - 1$ two-way roads. His job, like many others, is to transport mysterious substances from one village to another through these roads. Each village can travel to any other village using these roads. At each village, there is a population of p_i residents.

Yi has Q trips. For each trip, he must travel from village a to village b . He wants to find the *first* village on the path from a to b where the population is greater than or equal to k (including village a). If there are no villages with a population greater than or equal to k , or if it is impossible to travel between village a and village b (more to follow in the next paragraph), print `-1`.

Truck drivers, as it turns out, are not always very careful (unlike Yi). Sometimes, after Yi is finished his x^{th} trip, and before his $x + 1^{th}$, the mysterious substance that the other truck driver is carrying will spill onto road y , permanently destroying road y for any of Yi's subsequent trips (In particular, trip $x + 1$ to trip Q). This will happen R times. Note that this *may* render future trips to be impossible for Yi, in which case `-1` should be outputted for those trips.

Input Specification

The first line will contain three integers, N, Q, R ($1 \leq N \leq 10^5, 1 \leq Q \leq 10^5, 0 \leq R < N$).

The second line will contain N integers, p_1, p_2, \dots, p_N ($0 \leq p_i \leq 10^9$), the population of each village.

The next $N - 1$ lines will each contain two integers, u_i, v_i ($1 \leq u_i, v_i \leq N$), meaning that there is a road connecting village u_i and village v_i .

The next R lines will each contain two integers, x, y ($1 \leq x \leq Q, 1 \leq y < N$). This means that the y^{th} road (from the order in the input) is destroyed immediately after Yi's x^{th} trip. It is guaranteed that y is unique, however it is **not** guaranteed that x is unique.

The next Q lines will each contain a trip of the form `a b k` ($1 \leq a, b \leq N, 0 \leq k \leq 10^9$).

Output Specification

For each trip, output the first village on the path from a to b where the population is greater than or equal to k (including village a). If there is no path from a to b , or if no village has a population greater than or equal to k on the path, print `-1`.

Constraints

Subtask 1 [5%]

$N, Q \leq 100$

$$R = 0$$

Subtask 2 [35%]

$$R = 0$$

Subtask 3 [60%]

No additional constraints.

Sample Input 1

```
8 8 0
2 8 4 1 10 0 2 3
1 2
2 3
2 4
2 5
5 6
1 7
7 8
8 6 8
1 3 1
4 3 9
6 6 0
1 8 2
8 1 2
3 3 5
7 4 3
```

Sample Output 1

```
2
1
-1
6
1
8
-1
2
```

Sample Input 2

```
9 5 2
100 0 3 0 7 5 1 0 2
1 2
2 3
1 4
4 5
4 6
6 7
6 8
6 9
4 1
3 3
2 9 2
3 6 1
7 1 99
4 2 6
3 6 1
```

Sample Output 2

```
1
3
1
-1
-1
```