



Problem E: Snowbound Supplies

Time limit: 1s; Memory limit: 256 MB

A winter storm has covered the roads between a group of mountain villages with snow. A relief crew needs to collect supplies stored in the villages. To travel between villages, the crew uses a snowplough to clear the roads.

There are n villages, numbered from 1 to n , connected by $n - 1$ two-way roads. There is exactly one path between any two villages. Village i has a_i crates of supplies in storage, and each road has a known snow depth.

A snowplough with clearing capacity h can travel along a road if and only if its snow depth is at most h . The crew may visit any number of villages and use each road any number of times. It can collect the supplies from each village it visits, including its starting village, but each crate can be collected only once.

Your task is to answer q queries. Each query specifies a starting village v and a required number of crates k . Determine the smallest nonnegative clearing capacity that allows the crew to collect at least k crates, or determine that this is impossible.

The queries are independent: collecting supplies in one query does not affect the supplies available in any other query.

Input

The first line contains two integers n and q ($1 \leq n, q \leq 200,000$) — the number of villages and the number of queries.

The second line contains n integers $a_1, a_2, \dots, a_n$ ($0 \leq a_i \leq 10^9$), where a_i is the number of crates stored in village i .

Each of the next $n - 1$ lines contains three integers u, v , and w ($1 \leq u, v \leq n, u \neq v, 1 \leq w \leq 10^9$), describing a two-way road between villages u and v with snow depth w .

It is guaranteed that the roads connect all villages and that there is exactly one path between any two villages.

Each of the next q lines contains two integers v and k ($1 \leq v \leq n, 1 \leq k \leq 10^{15}$), describing a query.

Output

For each query, output one line containing the minimum clearing capacity needed to collect at least k crates when starting from village v . If this is impossible, output -1.

Sample

Sample 1

Sample Input	Sample Output
6 7	0
2 0 4 1 3 5	3
1 2 3	6
2 3 7	7
2 4 3	7
4 5 6	3
5 6 7	-1
1 2	



1 3 1 6 1 7 3 5 2 1 4 16	
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Sample 2

Sample Input	Sample Output
4 3 0 2 2 2 1 2 3 1 3 3 1 4 3 1 5 2 2 2 7	3 0 -1

Note / Explanation

First sample:

- In the first query, village 1 already has two crates, so the answer is 0.
- In the second query, starting from village 1, the crew can reach villages 1, 2, and 4 with a clearing capacity of 3. These villages store three crates in total.
- In the last query, sixteen crates are required, but only fifteen are available in total, so the answer is -1.

Second sample:

- In the first query, the crew must visit all three villages with supplies, returning through village 1 between visits. A clearing capacity of 3 is sufficient.