Problem J. Sometimes Naive

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	64 mebibytes

Rhason Cheung had a naive problem, and asked Teacher Mai for help. But Teacher Mai thought this problem was too simple, sometimes naive. So she ask you for help.

She has a tree with n vertices, numbered from 1 to n. The weight of i-th node is w_i.

You need to support two kinds of operations: modification and query.

For a modification operation u, w, you need to change the weight of u-th node into w.

For a query operation u, v, you should output $\sum_{i=1}^{n}\sum_{j=1}^{n} f(i,j)$. If there is a vertex on the path from u to v and the path from i to j in the tree, $f(i,j) = w_i w_j$, otherwise $f(i,j) = 0$. The number can be large, so print it modulo $10^9 + 7$.

Input

First line of the input contains one integer T ($1 \le T \le 10$) — number of test cases.

For each test case, the first line contains two integers n and m ($1 \le n, m \le 10^5$).

There are n integers in the next line, the i-th from them denotes w_i ($0 \le w_i \le 10^9$).

Next $n-1$ lines contain two numbers each, u_i and v_i, that means that there is an edge between u_i and v_i.

Then m lines follow. Each line indicates an operation, and the format is "`1 u w`" for modification or "`2 u v`" for query ($0 \le w \le 10^9$).

Output

For each test case, print the answer for each query operation.

Example

standard input	standard output
1 6 5 1 2 3 4 5 6 1 2 1 3 2 4 2 5 4 6 2 3 5 1 5 6 2 2 3 1 1 7 2 2 4	341 348 612