

Problem D – Determining rally paths

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During the celebration of the 50th anniversary of Jaime's school, they will be running a rally, in total E teams have signed to compete and there will be awesome prizes for each team that is able to finish the rally.

There are V stations in the rally and, when a team arrives at a station, the team should complete a challenge; once the challenge is completed, the rally staff will write a code C_i that demonstrates the team has completed the challenge in the station.

Before starting the rally, each team is assigned a starting and an ending station, then, when they start, they should complete the challenge in the first station and move to the next one, they repeat this until they finish the challenge in the ending station they have assigned. Once a team has finished all the challenges, the rally sheet of the team has all the codes of each challenge they completed concatenated, and they present the sheet to the rally staff to claim their prize. For example, if the codes in the stations a team visits are : 3, 2, 4, and 9 then the sheet will read 3249. To be fair, the rally has been planned in such way that there is always a unique path to go from one station to any other station in the rally.

As there are many teams, it is hard for the rally staff to determine what the sheet of each team should look like, that's why they are looking for help given the map of the rally and the initial and ending stations of each team to determine what number should be written in the sheet each team should provide to claim their rally prize.

Input

The first line of input contains two integer numbers separated by a space: V , and E , representing the number of stations in the rally and the number of teams that have signed to compete ($2 \leq V, E \leq 10^5$). The next line contains V integer numbers separated by space, where the i -th number represents the code C_i that the i -th station will write in the team sheet when the challenge is completed ($1 \leq C_i \leq 1000$). Next $V - 1$ lines, contain two numbers separated by a space a and b meaning there is a path between stations a and b in the rally ($1 \leq a, b \leq V$). Next E lines follow, each contains two numbers separated by a space e_s, e_f , representing the starting and ending stations of every team.

Output

For each team in the input, output a line containing an integer number representing the number the team should have written in the paper to show they completed the rally and claim the prize. As the number can be very large, the staff wants the remainder of the number after dividing it by 188888881.

Sample input 1	Sample output 1
7 3	412
1 3 7 9 1 4 2	137
1 2	139
2 3	
5 2	
4 2	
5 6	
7 5	
6 7	
5 3	
5 4	