Deserted Freshers

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

The Freshers are being taken out on a trip to the Maldives. There are n cities in Maldives, numbered from 1 to n. Two cities may be connected by a two-way road. There are m such two-way roads. Two cities are on the same island if and only if they are reachable from each other using the roads. The Freshers have been divided into n groups where the i^{th} group has a_i Freshers. Each group will be assigned to one city, where they will stay. We want the interaction between Freshers to be as high as possible. Two Freshers can interact with each other if and only if they are on the same island. You are given the task to assign the groups to cities such that the number of pairs of Freshers who can interact with each other is maximum.

Input

The first line of the input will contain two integers, n and m. $\left(1 \leq n, m \leq 10^5\right)$

The next line contains n space separated integers, where the i^{th} integer is a_i, the number of Freshers in the i^{th} group. $\left(1 \leq a_i \leq 10^3\right)$

The next m lines contain a pair of integers u and v, denoting that city u and city v are connected by a two-way road. $(1 \leq u, v \leq n)$

Output

In a single line, print n space-separated integers where the i^{th} integer denotes the city which is assigned to the i^{th} group of Freshers.

If there are multiple solutions for which the number of pairs of Freshers who can interact with each other is maximum, then you may output any one of them.

Examples

standard input	standard output
5 3 3 5 1 7 9 1 2 2 3 4 5	5 1 4 2 3
6 1 555 262 853 318 954 208 2 5	6 3 2 4 5 1

Note

In the first sample test case, we can assign the groups to the cities in the following way -

Group 1 is assigned to City 5

Group 2 is assigned to City 1

Group 3 is assigned to City 4

Group 4 is assigned to City 2

Group 5 is assigned to City 3

In this case, all 21 Freshers belonging to Groups 2, 4 and 5 can interact amongst each other, and also the 4 Freshers belonging to Groups 1 and 3 can interact amongst each other, which means that $\binom{21}{2} + \binom{4}{2}$

pairs of Freshers can interact with each other, which is the maximum possible attainable value. Note that there might be other ways of assigning the groups which lead to the exact same value.