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## Problem Monaco. Instant Noodles

Input file: `input.txt` or standard input  
Output file: `output.txt` or standard output  
Time limit: 2 seconds  
Memory limit: 512 megabytes

Wu got hungry after an intense training session, and came to a nearby store to buy his favourite instant noodles. After Wu paid for his purchase, the cashier gave him an interesting task.

You are given a bipartite graph with positive integers in all vertices of the **right** half. For a subset  $S$  of vertices of the **left** half we define  $N(S)$  as the set of all vertices of the right half adjacent to at least one vertex in  $S$ , and  $f(S)$  as the sum of all numbers in vertices of  $N(S)$ . Find the greatest common divisor of  $f(S)$  for all possible non-empty subsets  $S$ .

Wu is too tired after his training to solve this problem. Help him!

### Input

The first line contains a single integer  $t$  ( $1 \leq t \leq 500\,000$ ) — the number of test cases in the given test set. Test case descriptions follow.

The first line of each case description contains two integers  $n$  and  $m$  ( $1 \leq n, m \leq 500\,000$ ) — the number of vertices in either half of the graph, and the number of edges respectively.

The second line contains  $n$  integers  $c_i$  ( $1 \leq c_i \leq 10^{12}$ ). The  $i$ -th number describes the integer in the vertex  $i$  of the right half of the graph.

Each of the following  $m$  lines contains a pair of integers  $u_i$  and  $v_i$  ( $1 \leq u_i, v_i \leq n$ ), describing an edge between the vertex  $u_i$  of the left half and the vertex  $v_i$  of the right half. It is guaranteed that the graph does not contain multiple edges.

Test case descriptions are separated with empty lines. The total value of  $n$  across all test cases does not exceed 500 000, and the total value of  $m$  across all test cases does not exceed 500 000 as well.

### Output

For each test case print a single integer — the required greatest common divisor.

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## Example

input	output
3	2
2 4	1
1 1	12
1 1	
1 2	
2 1	
2 2	
3 4	
1 1 1	
1 1	
1 2	
2 2	
2 3	
4 7	
36 31 96 29	
1 2	
1 3	
1 4	
2 2	
2 4	
3 1	
4 3	

## Note

The greatest common divisor of a set of integers is the largest integer  $g$  such that all elements of the set are divisible by  $g$ .

In the first sample case vertices of the left half and vertices of the right half are pairwise connected, and  $f(S)$  for any non-empty subset is 2, thus the greatest common divisor of these values is also equal to 2.

In the second sample case the subset  $\{1\}$  in the left half is connected to vertices  $\{1, 2\}$  of the right half, with the sum of numbers equal to 2, and the subset  $\{1, 2\}$  in the left half is connected to vertices  $\{1, 2, 3\}$  of the right half, with the sum of numbers equal to 3. Thus,  $f(\{1\}) = 2$ ,  $f(\{1, 2\}) = 3$ , which means that the greatest common divisor of all values of  $f(S)$  is 1.