Direction Setting

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Given an undirected graph with n vertices and m edges where the i-th vertex has a limit a_i, please assign a direction for each edge so that the graph becomes directed and the following value D is minimized.

$$D = \sum_{i=1}^{n} \max(0, d_i - a_i)$$

where d_i is the in-degree (that is, the number of edges going into that vertex) of the i-th vertex.

Input

There are multiple test cases. The first line of the input contains an integer T indicating the number of test cases. For each test case:

The first line contains two integers n and m ($2 \le n \le 300$, $1 \le m \le 300$) indicating the number of vertices and edges.

The second line contains n integers $a_1, a_2, \cdots, a_n$ ($0 \le a_i \le 10^4$) where a_i indicates the limit of the i-th vertex.

For the following m lines, the i-th line contains two integers u_i and v_i ($1 \le u_i, v_i \le n$) indicating that there is an edge connecting vertex u_i and v_i. Note that there might be self loops or multiple edges.

It's guaranteed that neither the sum of n nor the sum of m of all test cases will exceed 3×10^3.

Output

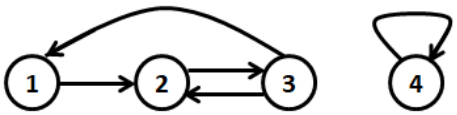
For each test case output two lines. The first line contains an integer indicating the smallest possible D. The second line contains a string $s_1 s_2 \cdots s_m$ of length m consisting only of '0's and '1's indicating a direction assignment plan of the edges to achieve the smallest possible D. If $s_i =$ '0' then the i-th edge is going from u_i into v_i; Otherwise it's going from v_i into u_i. If there are multiple valid answers you can output any of them.

Example

standard input	standard output
2 4 5 0 1 1 5 1 2 1 3 2 3 3 2 4 4 3 2 0 0 2 1 3 3 2	2 01001 0 01

Note

The first sample test case is shown as follows.


1
2
3
4