
Problem A. Defense Plan

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 megabytes

Potato Kingdom is about to be attacked by the evil Heltion Kingdom! As the Secretary of Defense, Little Sub must arrange the defense system very carefully.

There are n castles in Potato Kingdom in total and Little Sub is planning to equip some of them with cannons. However, if two castles are too close to each other, they cannot be both cannon-armed since they might hurt each other.

The i -th castle has a defense value of w_i . Let \mathbb{C} be the set of the **index** of all castles armed with cannons, we define the total defense value to be

$$\prod_{k \in \mathbb{C}} w_k$$

For completeness, if $\mathbb{C} = \emptyset$, the total defense value is defined to be 1.

There are many possible plans to equip cannons to these castles and Little Sub must choose a proper one. In order to value the situation correctly and more precisely, he wants to know about the variance S^2 of all feasible plan's total defense value (note that arming no castle with cannons is also a feasible plan). Two plans A and B are considered to be different if a castle is armed with cannons in plan A but not in plan B, or vice versa.

Recall that the variance S^2 of k values x_1, x_2, \dots, x_k can be calculated as follows:

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_k}{k} \quad S^2 = \frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_k - \bar{x})^2}{k}$$

Input

There will be only one test case in each test file (and of course we have prepared multiple test files).

The first line contains two integers n and m ($1 \leq n \leq 40, 0 \leq m \leq \frac{n(n-1)}{2}$), indicating the number of castles and conflict relations.

The second line contains n integers w_1, w_2, \dots, w_n ($0 \leq w_i \leq 2^{31} - 1$), indicating the defense value of castles.

For the following m lines, the i -th line contains two integers x_i and y_i ($1 \leq x_i, y_i \leq n, x_i \neq y_i$), indicating that the x_i -th and the y_i -th castle cannot be both armed with cannons.

Output

Output a single integer in a single line, indicating the answer. If the answer is $\frac{A}{B}$, please print $C(0 \leq C < 10^9 + 7)$ where $A \equiv C \times B \pmod{10^9 + 7}$.

Example

standard input	standard output
3 1 1 2 3 1 2	888888898

Note

Castles Armed	Defense Value	Castles Armed	Defense Value
{}	1	{3}	3
{1}	1	{1, 3}	3
{2}	2	{2, 3}	6

So the answer is $\frac{26}{9}$. As $9 \times 888888898 = 8000000082 \equiv 26 \pmod{10^9 + 7}$, we print 888888898.