IOITC 2021

Graph Count

You are given a simple undirected graph G with n nodes and m edges. There are exactly $k = n(n-1)/2 - m$ unordered pairs (i, j), such that the edge (i, j) is not present in the graph. For each of these pairs, we can choose whether to add the edge (i, j) to the graph. Out of the 2^k ways, let P be those in which all vertices of the final graph have degree 2. Print the value of $P \times n!^{2n}$ modulo $10^9 + 7$

Input

- The first line contains T, the number of testcases.
- The first line of each testcase contains n and m.
- Each of the next m lines contains two integers a and b denoting an undirected edge between a and b.

Output

For each testcase, print the value of $P \times n!^{2n}$ modulo $10^9 + 7$

Test Data

In all inputs,

- $1 \leq n$
- $0 \leq m \leq n$
- The sum of n over all testcases doesn't exceed 5000.
- $1 \leq a, b \leq n$
- The graph G doesn't have any self loops or multiple edges.

Subtask 1 (5 Points): $1 \leq T \leq 10, 1 \leq n \leq 6$

Subtask 2 (11 Points): $1 \leq T \leq 10, 1 \leq n \leq 11$

Subtask 2 (15 Points): $1 \leq T \leq 10, 1 \leq n \leq 40$

Subtask 4 (24 Points): The sum of n over all testcases doesn't exceed 700.

Subtask 5 (45 Points): No additional constraints

Sample Input

```
3
4 3
1 4
3 2
2 4
4 4
1 2
2 3
1 3
1 4
6 0
```

Sample Output

```
75313406
0
911365911
```

Explanation

In the first testcase, there is only one valid way, adding an edge between 1 and 3. So, $P = 1$, and we print $4!^8$ modulo $10^9 + 7$, which is 75313406.

In the second testcase, there is no valid way.

In the third testcase, there are 70 valid ways. We print $70 \times 6!^{12}$, which equals 911365911 modulo $10^9 + 7$.

Limits

Time: 1 seconds

Memory: 512 MB