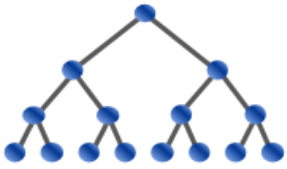
USA Computing Olympiad



USACO 2025 February Contest, Gold
Problem 3. Friendship Editing

Time Remaining: **3 hrs, 58 min, 43 sec**

Not submitted yet

English (en)

Farmer John's N cows are labeled 1 to N ($2 \leq N \leq 16$). The friendship relationships between the cows can be modeled as an undirected graph with M ($0 \leq M \leq N(N-1)/2$) edges. Two cows are friends if and only if there is an edge between them in the graph.

In one operation, you can add or remove a single edge from the graph. Count the minimum number of operations required to ensure that the following property holds: If cows a and b are friends, then for every other cow c, at least one of a and b is friends with c.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line contains N and M.

The next M lines each contain a pair of friends a and b ($1 \leq a < b \leq N$). No pair of friends appears more than once.

OUTPUT FORMAT (print output to the terminal / stdout):

The number of edges you need to add or remove.

SAMPLE INPUT:

```
3 1
1 2
```

SAMPLE OUTPUT:

```
1
```

The network violates the property. We can add one of edges $(2,3)$ or $(1,3)$, or remove edge $(1,2)$ to fix this.

SAMPLE INPUT:

```
3 2
1 2
2 3
```

SAMPLE OUTPUT:

```
0
```

No changes are necessary.

SAMPLE INPUT:

```
4 4
1 2
1 3
1 4
2 3
```

SAMPLE OUTPUT:

```
1
```

SCORING:

- Inputs 4-13: One input for each $N \in [6, 15]$ in increasing order.
- Inputs 14-18: $N = 16$

Problem credits: Benjamin Qi

Language: C

Source File: 选择文件 未选择文件

Submit Solution