Problem B
Jewel crafting

Input file: *testdata.in*
Time limit: 2 second

Problem Description

Peter is an experienced artisan, and he earns money from jewel crafting. He just bought N socketed rings $r_1, \ldots, r_N$ and M gems $g_1, \ldots, g_M$ from the market. Each ring can hold exactly one gem. Different combinations of rings and gems have different prices, so Peter has to make a plan on how to embed the gems to the rings. For convenience, Peter made an N-by-M table $(a_{i,j})$. Peter can sell ring r_i for $a_{i,j}$ dollars if gem g_j is embedded in ring r_i. However, a ring might be unable to hold some particular gems. If ring r_i cannot hold gem g_j, then $a_{i,j}$ is -1. Moreover, a ring cannot be sold without holding a gem, nor can a gem be sold without being installed on a ring.

Peter always has a trouble before he starts to install the gems into the sockets of the rings. He believes that the rings and the gems have feelings. Instead of maximizing the profit of jewel crafting, Peter decides to make the rings and the gems happy. The rings and the gems will be *happier* if they can be sold at a *higher* price. They also prefer to be sold. Sold rings and gems are always happier than the unsold ones.

After a long thought, he finally determined the combinations of the rings and the gems. He plans to embeds gems $g_{x_1}, \ldots, g_{x_K}$ into rings $r_{y_1}, \ldots, r_{y_K}$, respectively. However, he is not sure about whether this plan is good enough. He wants to compare his plan with other valid plans. A *valid* plan never embeds a gem into a ring which cannot hold it. Supposed plan Q embeds the gems in a different way. Let p be the number of rings and gems which feel happier with Peter's plan, and let q be the numbers of rings and gems which feel happier with plan Q. Plan Q is *better* than Peter's plan if and only if $q > p$. In order to evaluate the quality of Peter's plan, Peter asks you to help him to calculate how many valid plans are better than his.

Technical Specification

1. $T \leq 10$
2. $1 \leq N, M \leq 12$.
3. $1 \leq K \leq min(N, M)$.
4. $-1 \leq a_{i,j} \leq 10000$ and $a_{i,j} \neq 0$.
5. You can assume Peter's plan is valid.

Input Format

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. N is the number of rings, and M is the number of gems. The following N lines describe the table $(a_{i,j})$. The j-th integer in the i-th of the N lines is the value of $a_{i,j}$. Then, there is a line containing an integer K which represents the number of gems installed on the rings in Peter's plan. The following K lines describe Peter's plan. The i-th of them contains two integers x_i and y_i.

Output Format

For each test case, output the number of valid plans that are better than Peter's in a single line.

Sample Input

```
2
2 2
1 2
3 4
2
1 1
2 2
3 3
3 -1 2
5 1 3
3 1 2
```

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

Sample Output

```
0
2
```