## Problem C - Defesa Interestelar

The Intergalactic Nations Organization (ONI in Portuguese) is planning to equip its headquarters, Other New York (also ONI in Portuguese), with the latest military defense technology in the galaxy: Magnetic Protective Shields. A defense line consists of $\boldsymbol{N}$ energy generators in a line, numbered from 1 to $\boldsymbol{N}$, and $\boldsymbol{M}$ magnetic shields, each in the shape of a semicircle, with endpoints at two distinct energy generators $1 \leq a, b \leq$ $\boldsymbol{N}$. A generator can serve as a base for multiple protective shields, but there are no protective shields with the same two endpoints. We say that two shields with ends $a<b$ and $c<d$ intersect if $a<c<b<d$ or $c<a<d<b$.

There are $\boldsymbol{T}$ sets of energy generators and protective shields
 for which the ONI wants your help in choosing the best configuration of protective shields, according to different objectives.

## Part I

The ONI is interested in defending itself against scattered attacks. When a magnetic field is attacked, the intersecting fields become temporarily inactive as well. Therefore, the ONI wants to know, for each of its $\boldsymbol{T}$ sets, the size of the largest set $S$ of protective fields where there are no intersections between the protective fields in $S$, in order to assess the resilience of each plan against scattered attacks.

## Example

Let's assume that $\boldsymbol{N}=9$ and $\boldsymbol{M}=9$, and we have the following configuration of protective shields:


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A possible set of protective shields would be the following:


Note that there can be multiple protective shields chosen with the same end.

## Constraints

The following limits are guaranteed for all test cases of this part that will be given to the program:

$$
\begin{array}{ll}
1 \leq \boldsymbol{T} \leq 10 & \text { Number of sets } \\
2 \leq \boldsymbol{N} \leq 250 & \text { Number of energy generators } \\
1 \leq \boldsymbol{M} \leq 6000 & \text { Number of protective shields }
\end{array}
$$

The test cases of this part of the problem are organized into three groups:

| Subtask | Points | Additional Constraints |
| :--- | :--- | :--- |
| 1 | 10 | $\boldsymbol{N} \leq 10, \boldsymbol{M} \leq 16$ |
| 2 | 10 | All protective shields have the same size |
| 3 | 30 | No further restrictions |

## Part II

The ONI also wants to ensure that its capital is able to defend itself against concentrated attacks, and for that, it is crucial to have a region with many intersections. Therefore, they want to know, for each of their $\boldsymbol{T}$ sets, the size of the largest set $S$ of protective shields where all shields intersect with each other, in order to assess the resilience of each plan against concentrated attacks.

## Example

Let's assume that $\boldsymbol{N}=9$ and $\boldsymbol{M}=9$, and we have the following configuration of protective shields:


A possible set of protective shields would be the following:


Note that despite the protective shield with endpoints 1,6 also intersecting with two of the chosen shields, it does not intersect with the arc 2,6 , as two protective shields having one endpoint in common does not count as an intersection.

## Constraints

The following limits are guaranteed for all test cases of this part that will be given to the program:

| $1 \leq \boldsymbol{T} \leq 10$ | Number of sets |
| :--- | :--- |
| $2 \leq \boldsymbol{N} \leq 250$ | Number of energy generators |
| $1 \leq \boldsymbol{M} \leq 6000$ | Number of protective shields |

The test cases of this part of the problem are organized into three groups:

| Subtask | Points | Additional Constraints |
| :--- | :--- | :--- |
| 4 | 10 | $\boldsymbol{N} \leq 10, \boldsymbol{M} \leq 16$ |
| 5 | 10 | All protective shields have the same size |
| 6 | 30 | No further restrictions |

## Summary of Subtasks

The test cases for the problem are organized into six groups with different additional restrictions:

| Subtask | Points | Part | Additional Constraints |
| :--- | :--- | :--- | :--- |
| 1 | 10 | Parte I | $\boldsymbol{N} \leq 10, \boldsymbol{M} \leq 16$ |
| 2 | 10 | Parte I | All protective shields have the same size |
| 3 | 30 | Parte I | No further restrictions |
| 4 | 10 | Parte II | $\boldsymbol{N} \leq 10, \boldsymbol{M} \leq 16$ |
| 5 | 10 | Parte II | All protective shields have the same size |
| 6 | 30 | Parte II | No further restrictions |

## Input Format

The first line contains an integer $\boldsymbol{P}$, which represents the part that the test case refers to. If it is 1 , then the test case refers to Part I, and if it is 2 , it refers to Part II. The input has the same format regardless of the part.

This is followed by a line containing an integer $\boldsymbol{T}$, representing the number of sets to consider.
$\boldsymbol{T}$ sets of lines follow, each following the following format:
A line with two integers $\boldsymbol{N}$ and $\boldsymbol{M}$, the number of power generators and magnetic protective shields in that plan, respectively.
$\boldsymbol{M}$ lines with 2 integers separated by spaces $a, b$ and between 1 and $\boldsymbol{N}$, which represent the endpoints of a protective shield. It is guaranteed that there are no two protective shields with the same two generators in each set.

## Output Format

## Part I

The output should contain $\boldsymbol{T}$ lines, each containing an integer: the size of the largest set of non-intersecting protective shields in that plan.

## Part II

The output should contain $\boldsymbol{T}$ lines, each containing an integer: the size of the largest set of protective shields where all shields intersect with each other in that plan.

## Example 1 Input

```
1
1
9
12
16
25
26
34
35
4
59
7
```

Example 1 Output
7

## Example 1 Description

This example corresponds to the example mentioned in Part I of the problem statement.

## Example 2 Input

```
2
1
9
12
16
25
26
34
35
47
59
7
```


## Example 2 Output

## 3

## Example 2 Description

This example corresponds to the example mentioned in Part II of the problem statement.
Example 3 Input

```
1
3
59
2 1
45
13
41
1 5
2 3
5 3
24
52
57
1 5
2 5
54
41
1 3
4 3
3 5
57
12
24
1 3
51
2 5
34
5 3
```


## Example 3 Output

```
6
5
5
```


## Example 4 Input

```
2
2
5
2 1
4
13
4 1
15
2 3
5
24
5
5 5
34
51
2 1
45
42
```


## Example 4 Output

```
2
1
```

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