

Problem E

Exchanges



ACM Central European Programming Contest, Warsaw 2001, Poland

Given n integer registers r_1, r_2, \dots, r_n we define a Compare-Exchange Instruction $CE(a, b)$, where a, b are register indices ($1 \leq a < b \leq n$):

```
CE(a, b) ::  
  if content( $r_a$ ) > content( $r_b$ ) then  
    exchange the contents of registers  $r_a$  and  $r_b$ ;
```

A Compare-Exchange program (shortly CE-program) is any finite sequence of Compare-Exchange instructions. A CE-program is called a Minimum-Finding program if after its execution the register r_1 always contains the smallest value among all values in the registers. Such program is called reliable if it remains a Minimum-Finding program after removing any single Compare-Exchange instruction.

Given a CE-program P , what is the smallest number of instructions that should be added at the end of program P in order to get a reliable Minimum-Finding program?

Example

Consider the following CE-program for 3 registers:

$CE(1, 2); CE(2, 3); CE(1, 2)$.

In order to make this program a reliable Minimum-Finding program it is sufficient to add only two instructions, $CE(1, 3)$ and $CE(1, 2)$.

Task

Write a program which for each data set:

- reads the description of a CE-program,
- computes the smallest number of CE-instructions that should be added to make this program a reliable Minimum-Finding program,
- writes the result.

Input

The first line of the input contains exactly one positive integer d equal to the number of data sets, $1 \leq d \leq 10$. The data sets follow.

Each data set consists of exactly two consecutive lines.

The first of those lines contains exactly two integers n and m separated by a single space, $2 \leq n \leq 10\,000$, $0 \leq m \leq 25\,000$. Integer n is the number of registers and integer m is the number of program instructions.

The second of those lines contains exactly $2m$ integers separated by single spaces — the program itself. Integers a_j, b_j on positions $2j - 1$ and $2j$, $1 \leq j \leq m$, $1 \leq a_j < b_j \leq n$, are parameters of the j -th instruction in the program.

Output

The output should consist of exactly d lines, one line for each data set.

Line i , $1 \leq i \leq d$, should contain only one integer — the smallest number of instructions that should be added at the end of the i -th input program in order to make this program a reliable Minimum-Finding program.

Example

For the input:

1

3 3

1 2 2 3 1 2

the correct answer is:

2