# A - Prove Them All

*Source file name:* `all.c`, `all.cpp`, *or* `all.java`
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Alex is a developer at the *Formal Methods Inc.* central office. Everyday Alex is challenged with new practical problems related to automated reasoning. Along with her team, Alex is currently working on new features for a computational theorem prover called "Prove Them All" (or PTA for short). The PTA inference engine is based, mainly, on the *modus ponens* inference rule:

$$\frac{\psi, \quad (\psi \to \phi)}{\therefore \phi}$$

This rule is commonly used in the following way: for any pair of formulae $\phi$ and $\psi$, if there is a proof of the formula $\psi$ and a proof of the logical implication $(\psi \to \phi)$, then there is a proof of $\phi$. In other words, if $\psi$ and $(\psi \to \phi)$ are theorems, then $\phi$ is a theorem too.

Today's challenge for Alex and her team is as follows: given a collection of formulae $\Gamma$ and some relationships among them in the form of logical implication, what is the minimum number of formulae in $\Gamma$ that need to be proven (outside of PTA) so that the rest of formulae in $\Gamma$ can be proven automatically using only modus ponens?

## Input

The input consists of several test cases. The first line of the input contains a non-negative integer indicating the number of test cases. Each test case begins with a line containing two blank-separated integers $m$ and $n$ ($1 \le m \le 10000$ and $0 \le n \le 100000$), where $m$ is the number of formulae in $\Gamma$ of the form $\phi_a$ and $n$ the number of logical implications which have been proven between some of these formulae. The next $n$ lines contain each two blank-separated integers $a$ and $b$ ($1 \le a, b \le m$), indicating that $(\phi_a \to \phi_b)$ is a proven logical implication. Each test case in the input is followed by a blank line.

*The input must be read from standard input.*

## Output

For each test case, output one line with the format "`Case k: c`" where $k$ is the case number starting with 1 and $c$ is the minimum number of formulae in $\Gamma$ that need to be proven outside of PTA so that the rest of the formulae in $\Gamma$ can be proven automatically using only modus ponens.

*The output must be written to standard output.*

| Sample Input | Sample Output |
|---|---|
| 1 | Case 1: 2 |
| 4 4 | |
| 1 2 | |
| 1 3 | |
| 4 2 | |
| 4 3 | |