|  | Quboids |
| --- | --- |

A Qutron power plant consists of **N** Quboids (cube-shaped power generators). For convenience these Quboids are numbered from 1 to N. Each Quboid produces a fixed amount of energy. Some of these Quboids are connected through wires such that the energy difference of two connected Quboids does not exceed **N** unit. The capacity of the power plant is determined by the maximum energy difference between any two Quboids.

You are given the number of Quboids and wire configurations of the power plant. Determine the capacity of the power plant. Note that, some intelligent wire configurations can lead to infinite capacity.

**Input:**

Input starts with an integer **T (T <= 120)** indicating the number of test cases. The first line of each test case consists of two integer **N (1 <= N <= 50)** and **M (0 <= M <= NC2)** indicating the number of Quboids and the number of wires respectively. Each of the next **M** lines will contain two integers **X** and **Y (X != Y and 1 <= X, Y <= N)** indicating Quboid **X** and **Y** are connected through a wire.

**Output:**

For each test case print either the capacity of the power plant or, the word **INFINITY** in one line.

| **Sample Input** | **Sample Output** |
| --- | --- |
| 3  3 2  1 2  2 3  2 0  6 5  1 3  2 3  3 4  4 5  4 6 | 6  INFINITY  18 |