Alice recently started to work for a hardware design company and as a part of her job, she needs to identify defects in fabricated integrated circuits. An approach for identifying these defects boils down to solving a satisfiability instance. She needs your help to write a program to do this task.

**Input**

The first line of input contains a single integer, indicating the number of test cases to follow. The first line of each test case contains two integers $n$ and $m$ where $1 \leq n \leq 20$ indicates the number of variables and $1 \leq m \leq 100$ indicates the number of clauses. Then, $m$ lines follow corresponding to each clause. Each clause is a disjunction of literals in the form $X_i$ or $\sim X_i$ for some $1 \leq i \leq n$, where $\sim X_i$ indicates the negation of the literal $X_i$. The “or” operator is denoted by a ‘v’ character and is separated from literals with a single space.

**Output**

For each test case, display ‘satisfiable’ on a single line if there is a satisfiable assignment; otherwise display ‘unsatisfiable’.

**Sample Input**

```
2
3 3
X1 v X2
~X1
~X2 v X3
3 5
X1 v X2 v X3
X1 v ~X2
X2 v ~X3
X3 v ~X1
~X1 v ~X2 v ~X3
```

**Sample Output**

```
satisfiable
satisfiable
unsatisfiable
```