Lab: AI & ML 20/10/2021:

Write a Program to Implement the following Scenario using 3 SAT algorithm.

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, not more than 5, indicating the number of test cases to follow. The first line of each test case contains two integers n and m where 1 ≤ n ≤ 20 indicates the number of variables and 1 ≤ m ≤ 100 indicates the number of clauses. Then, m lines follow corresponding to each clause. Each clause is a disjunction of literals in the form Xi or ~Xi for some 1 ≤ i ≤ n, where ~Xi indicates the negation of the literal Xi. 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
unsatisfiable

Upload link:
https://forms.office.com/Pages/ResponsePage.aspx?id=p1CEoozbM0yRKkQzEbIt26j5uR98u7pHk4YAJdVRMgxUQ1Q1NkYxN1hQT1g2SVhUUzZYMVg0SjE0My4u

Submit it on or before:12:40 PM, 20.10.2021