Ghost

One lazy afternoon, Lea and her friend Bea sit at home. They are both bored out of their minds, so they decide to play a game to pass the time. Since both are too lazy to get up from the sofa and get a boardgame from the cupboard, they settle on the game "Ghost". "Ghost" is a simple word game, where Lea and Bea take turns announcing a single letter to build a word fragment. The rules are as follows: The announced letters have to form the beginning of a valid word. However, the player who completes a word loses.

So for example if Lea starts with "P" and Bea replies with "i", then Lea would lose if she said "g" or "e". She could, however, say "z" (starting to spell "Pizza", for example) and thus continue the game. However, if Lea (or Bea, respectively) did not know any word starting with "Piy", then announcing "y" would be against the rules.

Knowing this day would come, Lea has already prepared a list of all the words she knows. Smugly, she assumes that Bea does not know any words she does not know herself. Now, Lea and Bea play a few rounds culminating in a "final showdown" round. (All of those rounds are independent of each other, so two rounds could spell out the exact same word.) The loser of the last round has to get up and get a boardgame from the cupboard. Bea is also quite skilled at the game, so Lea wants to know if she can win against Bea even if Bea plays perfectly.

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line.

Each test case consists of two integers n and w, with n being the amount of rounds played and w being the amount of words Lea knows. w lines follow, each containing a word s, consisting of lowercase letters from "a" to "z".

Output

For each test case, output one line containing "Case #i:" where i is its number, starting at 1. Then output four lines, corresponding to four different scenarios. In the i-th line, print "victory", if Lea can win the last round n according to the i-th scenario, and "defeat" otherwise.

- Scenario 1: Lea begins in round 1. The winner of round k begins in the next round $k + 1$.
- Scenario 2: Lea begins in round 1. The loser of round k begins in the next round $k + 1$.
- Scenario 3: Bea begins in round 1. The winner of round k begins in the next round $k + 1$.
- Scenario 4: Bea begins in round 1. The loser of round k begins in the next round $k + 1$.

Constraints

- $1 \leq t \leq 50$
- $1 \leq n \leq 1000$
- $1 \leq w \leq 10000$
- $1 \leq |s| \leq 300$

Sample Input 1

```
2
2 5
chilling
wicked
haunting
spooky
fortress

4 2
piece
pies
```

Sample Output 1

```
Case #1:
victory
defeat
defeat
victory
Case #2:
defeat
defeat
victory
victory
```

Sample Input 2

```
5
4 12
yyhib
yyiel
yywfo
yypgj
yyirkx
yylixp
yzgjux
yyrlr
yyird
yylca
yyrdug
yyiihb

1 3
zgo
zon
zeg

3 7
zhoph
zfigualf
zfiwfq
zfigul
zwbjg
zfiwr
zfiguaw

4 6
zvmnj
zvmnwox
zvsae
zvcttb
zvsacfk
zgujn

4 3
ztswwxr
ztubkb
ztswb
```

Sample Output 2

```
Case #1:
defeat
defeat
victory
victory
Case #2:
defeat
defeat
victory
victory
Case #3:
defeat
defeat
victory
victory
Case #4:
victory
defeat
defeat
victory
Case #5:
victory
victory
defeat
defeat
```