Problem HULKGAME: Game of Hulk

Sometimes when the world is not in danger and no evil overlord is planing anything mean, even superheroes can spend their free time. Therefore, the most powerful and green superhero of all, *The Incredible Hulk*, invented a card game for these occasions. It consists of a deck of 44 cards. 40 of them are ordinary cards. They have a suite and a number denoting their value. There are four suites like in most card games. They are light green (L), neon green (N), green (G), and dark green (D). For each suite there are ten cards labeled from 0 to 9. In addition to that there are four special cards without a suite or number. They show Hulk in impressive poses and are labeled with an H.

The game can be played by two up to eleven players, numbered from 0 to $p - 1$. Before a game the players have to decide the number of rounds to be played. A game is at least one round. But the maximum number is limited only by the time available until the world has to be rescued again. At the beginning of each round a card is drawn from the deck to denote the trump suite for this round. If this is a Hulk card, another card is picked until an ordinary card is found which denotes the trump. Afterwards all cards are shuffled again.

Every player then draws four cards. Player 0 begins every round (unlike in other card games where the beginning player changes from round to round). This game's rules are so easy that even Superman can understand them. Player 0 plays one of his cards. Then follows player 1 and so on until every player has played one card. After all players are finished, it has to be determined who won this round. When counting is finished, all cards (including the three cards remaining with each player) are shuffled again and the next round begins.

Only cards of the first played suite, cards of the trump suite, and Hulk cards score. The first played Hulk card wins no matter what. If no Hulk is played, the highest trump card scores this round. If neither a Hulk nor a trump is played, the highest card of the suite of the first played card wins.

Due to the fact that not all superheroes are as intelligent as *The Incredible Hulk*, you have to write a program that displays the winner of each round.

Input

The input consists of several testcases. The first line of the input contains the number of testcases. Each testcase begins with a line that holds a single number p ($2 \leq p < 12$) giving the number of players that participate in this game. The next line consists of a single number r ($1 \leq r < 2^{16}$) denoting the number of rounds to be played. For each round r there are two lines describing the game's progress. The first line of each round gives the trump suite (L, N, G, D) for this round. The next line describes what cards have been played in this round. The first entry belongs to player 0 and the last to player number $p - 1$. All entires are separated from each other by at least one whitespace. Each entry consist one character for the suite and one digit for the value of the played card. For the Hulk card, denoted by an H, an arbitray number between 0 and 9 is given. Letter and number are separated by at least one whitespace. Refer to the Sample Input for further clarification.

Output

For every testcase you have to print the winner of each round, formatted as specified in the Sample Output. The output for each round has to be printed in a single line.

Print a single blank line between the outputs for each testcase.

(Sample Input and Output are provided on the next page)