As you all might know, the new season of English Premier League has started. You have been assigned as an official match scheduler. There are *n* teams in the league and they are from various cities. You also know their respective final ranks from the previous season. You have to fulfill the conditions stated below while preparing the schedule:

- Each team must play **exactly g** games (where, **g <= n/2)**.
- Odd ranked teams can't play with each other.
- Even ranked teams can't play with each other.
- Teams from the same city can't play with each other.

Now you are given the necessary data. You need to determine whether it is possible to schedule the games according to the given conditions.

Input

Input starts with an integer T (≤ 200), denoting the number of test cases.

Each case contains two integer n, g (n = 2k where 1≤k and 1≤g ≤ n/2). Each of the next n lines will contain the information for a team. Each line will contain 1 string and 2 integers denoting their name, previous season final rank and city code respectively. You can assume that city code will be within 1 to 100.

Output

For each case, print the case number and if the scheduling is possible or not.

Sample

Input	Output
2 6 2 Arsenal 1 1 ManCity 2 2 Tottenham 3 1 ManU 4 2 Liverpool 5 4 Westham 6 3 6 2 Arsenal 1 1 ManCity 2 2 Tottenham 3 1 ManU 4 2 Liverpool 5 3 Chelsea 6 1	Case 1: Yes Case 2: No