UEFA Champions League (ucl)

Stefan is a big football fan! He just read about some past competitions where teams are divided into groups, and each team plays against every other team in its group twice. A team is awarded three points for a win, one point for a draw and zero points for a loss.

Given the final standings of T groups, help Stefan find out whether there is a unique way of assigning the results for each match such that we end up having the final standings given. However, since the data can be faulty, there can also be a chance that the standings of some groups are not valid, so you will also have to help Stefan find them out.

Figure 1: Stefan being a huge football fan.

In particular, the teams in the standings of each group are given in **decreasing order of points**, and if two or more teams have the same number of points, they are ordered in **decreasing order of wins**.

Given the number of wins, draws and losses of each team, you have to print one of the following strings:

- "`Unique`" if there is **only one way** of assigning the result (win, draw or loss) to each match (also distinguishing the two matches between a same pair of teams);
- "`Not unique`" if instead there is **more than one way** of assigning the results to get the given standings;
- "`Invalid`" if the group results are invalid, that is, if it is **impossible to assign results** to each match so that they are coherent with the given standings, or if the teams are **not in the correct order**.

Note that Stefan is not interested in the exact result of each match: he only wants to know which team won or if the match ended in a draw.

☞ Among the attachments of this task you may find a template file `ucl.*` with a sample incomplete implementation.

Input

The first line contains the only integer T, the number of groups. Then the T groups are described, one after the other. For each group description, the first line contains one integer N, the number of teams in the group. Then N lines follow, each containing a 3-digit number: the first digit is the number of wins, the second digit is the number of draws and the last digit is the number of losses of a single team.

Output

You need to write T lines each containing either the string "`Unique`", "`Not unique`" or "`Invalid`".

Constraints

- $1 \leq T \leq 100\,000$.
- $2 \leq N \leq 4$ for each group.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) $N = 2$ for each group.

– **Subtask 3** (20 points) $2 \leq N \leq 3$ for each group.

– **Subtask 4** (15 points) $T \leq 10$.

– **Subtask 5** (25 points) All the standings are guaranteed to be valid.

– **Subtask 6** (30 points) No additional limitations.

Examples

input	output
6 4 600 402 204 006 4 402 402 402 006 2 110 011 2 011 110 3 400 022 022 4 330 240 042 114	Unique Not unique Not unique Invalid Unique Invalid

Explanation

The sample case consists of five groups.

In the **first group**, there is only one way to assign the outcomes of each match. In particular, the first team has won all the matches and the last one has lost all of them. The second team has won all the matches, except the ones against the first team. The third team has lost all the matches, except the ones against the las team.

In the **second group**, the last team has lost all the matches he played. However, Stefan cannot determine the results of the matches played among the first three teams.

In the **third group**, the first team has won against the second in one match, and draw in the other match. Since there is no way to determine which of the two matches is a win and which is a draw, the configuration should be marked as "Not unique".

In the **fourth group**, the results are the same as in the third group, but the standings are in the wrong order. Therefore, the configuration is invalid.

In the **fifth group**, the first team has won against the other two. They, instead, tied with each other in both their matches. The result of each match is then uniquely determined, therefore, the configuration should be marked as "Unique".

In the **sixth group**, although there are ways to obtain the given standings, they are not presented in the correct order: in particular, the last two teams have the same number of points, but are not ordered by decreasing number of wins.