

## Problem 5. Hockey

Input file: `input.txt`  
Output file: `output.txt`  
Time limit: 1 second  
Memory limit: 256 megabytes

*Rules described in this problem differ from the conventional hockey rules.*

A hockey match lasts 60 minutes, with two teams trying to score as many goals as possible. A hockey team consists of five field players and a goalkeeper.

Penalties are an important part of hockey. A field player can be given a penalty: in this case, the offending player leaves the ice for a period of time which depends on the violation. As the result, the number of players on the ice temporarily decreases for the team the offending player belongs to. There are two types of penalties in hockey: *major* and *minor*. A major penalty means the player leaves the ice for five minutes; with minor penalty, it is two minutes. When penalty time runs out, the player returns to the ice.

A minor penalty can be ended prematurely. A team is said to be playing short-handed when it has less players on the ice than the other team. If a team is playing short-handed and opponent scores a goal, then one of its players with minor penalty returns to the ice with his penalty expired ahead of time. If the team has several players with minor penalty, only the player who got the penalty first returns to the ice. If there are no players with minor penalties in the team, no one returns ahead of time.

Penalties during the game mean that the teams can play in various formats regarding the number of field players on the ice. We will denote the game format by  $A \times B$ , meaning the first team currently has  $A$  field players on the ice, and the second team has  $B$ . For instance, in the beginning of the game each team has five players on the ice, and this format is denoted as  $5 \times 5$ . If the first team currently has two players with penalty, and the second team has one, the format is denoted as  $3 \times 4$ .

You are given a game protocol, registering the time of all penalties and goals. Calculate which formats happened during the game and for how long each format was played.

### Input

The first line of the input file contains an integer  $N$  — the number of events in the match ( $0 \leq N \leq 1000$ ).

The following  $N$  lines describe the events of the match, one per line. Events are described in the following format:

`mm:ss.d team type`

Where `mm:ss.d` — time of event with the precision of tenths of a second ( $0 \leq mm \leq 59$ ,  $0 \leq ss \leq 59$ ,  $0 \leq d \leq 9$ ), `team` — team number (either 1 or 2), `type` — event type:

- `goal` — team scores a goal;
- `minor` — team player receives minor penalty;
- `major` — team player receives major penalty.

It is guaranteed that events of the type `goal` have non-zero decimal of a second, i.e.  $d \neq 0$ , and events of the type `minor` and `major` always have zero decimals of a second, i.e.  $d = 0$ .

Events are listed chronologically, i.e. they are arranged in the order of non-reduction of event times. It is guaranteed that at any moment of time each team has no more than 5 players.

## Output

For each format of the game in which the teams have played non-zero time, print the format denotation and the time spent by the teams in this format in a separate line, separated by a space character. The format of time must be exactly the same as the format used in the input data. Lines can be printed in arbitrary order.

## Example

input.txt	output.txt
10	4x3 00:47.9
06:41.0 1 minor	4x4 01:12.1
07:20.4 2 goal	4x5 06:39.4
22:22.0 2 minor	5x4 00:50.0
22:32.0 1 minor	5x5 50:30.6
23:00.1 1 goal	
23:12.0 2 minor	
23:59.9 1 goal	
41:02.0 1 major	
41:04.5 2 goal	
59:00.0 1 minor	

## Example explanation

The game from the example had the following intervals:

- [00:00.0; 06:41.0) — until the first penalty, the game went in the initial format 5x5;
- [06:41.0; 07:20.4) — after a penalty, the teams were playing in the format 4x5 until the first team lost a goal while playing short-handed, and the player removed for a minor penalty returned to the ice;
- [07:20.4; 22:22.0) — the teams were playing in full numbers 5x5 until a penalty;
- [22:22.0; 22:32.0) — until the next penalty, the teams were playing in the format 5x4;
- [22:32.0; 23:00.1) — until a goal was scored, the teams were playing in the format 4x4, however, no players returned to the ice after the goal, because it was scored with equally-sized teams;
- [23:00.1; 23:12.0) — the teams continued playing in the format 4x4 until another penalty;
- [23:12.0; 23:59.9) — after that, the teams were playing in the format 4x3 until a goal was scored, and the second team player who had been penalized at 22:22.0 returned to the ice;
- [23:59.9; 24:32.0) — the teams were playing 4x4 until the first team player's penalty ran out;
- [24:32.0; 25:12.0) — the teams were playing in the 5x4 format until the second team player's penalty ran out;
- [25:12.0; 41:02.0) — the teams were playing in the full format 5x5 until a major penalty;
- [41:02.0; 41:04.5) — before the goal, the teams played in the format 4x5, but because a player of the team that lost a goal had a major penalty, that player does **not** leave the penalty box;

- [41:04.5; 46:02.0) — the teams continued playing as 4x5, until the first player's penalty ran out;
- [46:02.0; 59:00.0) — before the penalty, the teams were playing with all players 5x5;
- [59:00.0; 60:00.0) — teams ending the game in the format 4x5.