2514 - Elo Calculator

Description

The Elo rating system is a method for calculating the relative skill level of players in competitor-versus-competitor games such as chess. It is named after its creator Arpad Elo, a Hungarian-born American physics professor. The difference in the ratings between two players serves as a predictor of the outcome of a match. If two players with equal ratings play against each other, they are expected to score an equal number of wins. A player whose rating is 100 points greater than his or her opponent's is expected to score 64%, if the difference is 200 points the expected score for the stronger player is 76%.

A player's Elo rating is represented by an integer number, which increases or decreases based upon the outcome of games between rated players. After every game, the winning player takes points from the losing one. The total number of points gained or lost after a game is determined by the difference between the ratings of the winner and loser. In a series of games between a high-rated player and a low-rated player, the high-rated player is expected to score more wins. If the high-rated player wins, only a few rating points will be taken from the low-rated player. However, if the lower rated player scores an upset win, many rating points will be transferred. The lower rated player will also gain a few points from the higher rated player in the event of a draw. This makes the rating system self-correcting. A player whose rating is too low should, in the long run, do better than the rating system predicts, and thus gain rating points until the rating reflects the true playing strength.

When a player competes in a tournament the quantity of expected score it is determined according to the level of the rest of the participants in the tournament. Supposing a player was expected to score We points but actually scored W points. The formula for updating his rating is R = Ra + K (W - We), where:
•R is the new rating.
•Ra is the rating before play in a tournament.
•K is an integer value that each player has.
Your task consists in finding the new rating of each player in a tournament.

Input specification

The first line consists of two space-separated values S and N where S is one string representing the Tournament's name and N is the number of players. The following N lines have the information about the players, one player per line. For each player, this data is the player's last name L (string), an integer number with the rating (Ra, 1900 < Ra < 3000), two real values (W and We, 0 < W, We <= N) and an integer number K (1 <= K <= 30), all separated by single spaces. All strings have at

most 30 characters, and there aren't two players with the same last name.

Output specification

•Line 1 has the format "Tournament: S" (without quotes) where S is the Tournament's name.
•Line 2 has the format "Number of players: N" (without quotes) where N is the number of players.
•Line 3 has the format "New ratings:" (without quotes).
•Lines 4…N+3 have the new ratings of each player, in the same order of the input. Each line has the format "L R" (without quotes) where L is the player's last name and R his new rating.
•Line N+4 has the format "Media Elo: M" (without quotes) where M is the average of the rating of all players, before Tournament.
All ratings of the output, including the average rating, are rounded to zero decimal places, i.e. rounded to the integer value.

Sample input

```
Capablanca 5
Delgado 2700 3.6 0.3 20
Quesada 2639 2.6 2.7 20
Gonzalez 2520 1.6 3.6 30
Bruzon 2698 1.4 4.8 10
Arencibia 2526 2.9 1.9 10
```

Sample output

```
Tournament: Capablanca
Number of players: 5
New ratings:
Delgado 2766
Quesada 2637
Gonzalez 2460
Bruzon 2664
Arencibia 2536
Media Elo: 2617
```

Hint(s)

Source	Yosuan Hernández Roque
Added by	**ymondelo20**

Addition date	2013-09-20
Time limit (ms)	5000
Test limit (ms)	1000
Memory limit (kb)	256000
Output limit (mb)	64
Size limit (bytes)	15000
Enabled languages	Bash C C# C++ Java Pascal Perl PHP Python Ruby Text