

Horses

It is already April. Most of the horses in the Spanish Racing League have assumed their positions and run with less energy if they *know* they are going to lose a race. The Spanish Racing League is a group of 20 horses, where they all race against each other twice every year. If the difference between two horses in the league table is greater than 4 positions, the winner of the race will be the one which is above the other in the table, as the other will not bother and will assume defeat. Otherwise, there will be a draw. The league table is only updated at the end of each round, so the results of races in the same round are independent of each other.

With this information in hand, Fred goes to bet. He takes a folder with the league table and the multipliers of each race.

A multiplier is a coefficient which is multiplied with the amount betted in case the prediction is fulfilled. For example, if horse *A* and horse *B* race against each other, and the multipliers are 1.1 (horse *A* wins), 1.2 (draw) and 1.3 (horse *B* wins), and Fred bets 10 euros, he will receive 11 if he bets for *A* and *A* wins, 12 if he bets for a draw and there is a draw, 13 if he bets for *B* and *B* wins and 0 if his prediction does not match the outcome.

Also, as not all races are at the same time, if he earns money betting in one, he can bet this money in another race, as long as this second race does not start earlier than the end of the previous one (races last 1h30). You can assume that all races of a round start on the same day, with the start time between 01 : 30 and 23 : 59 (both included). As there are 20 horses, there will be 10 races and each horse will participate in exactly one. Would you be able to help Fred maximise his earnings that round? Output the maximum combined multiplier he would be able to achieve by betting optimally.

Note: this problem is an adapted version of a problem I designed (in Spanish) for the 1st edition of the *Spanish Informatics Olympiad for Girls*.