

5025 Arranging Your Team

Your country has qualified for the FIFA 2010 South Africa World Cup. As the coach, you have made up the 23 men squad. Now you must select 11 of them as the starters. As is well known, there are four positions in soccer: goalkeeper, defender, midfielder and striker. Your favorite formation is 4-4-2, that is, you should choose 4 defenders, 4 midfielders, 2 strikers, and of course, 1 goalkeeper. As a retired ACMer, you want to write a program to help you make decision. Each person's ability has been evaluated as a positive integer. And what's more, for some special pairs of persons, if the two people are both on the field, there will be an additional effect (positive or negative). Now you should choose the 11 persons to make the total value maximum.

Input

There are multiple test cases, separated by an empty line. The first 23 lines of each test case indicate each person's name S_i , ability value V_i , and position. The length of each name is no more than 30, and there are no whitespaces in the names. All the names are different. The ability values are positive integers and no more than 100. The position is one of 'goalkeeper', 'defender', 'midfielder' and 'striker'.

Then an integer M indicates that there are M special pairs. Each of the following M lines contains S_i , S_j and C_{ij} , means that if S_i and S_j are both on the field, the additional profit is C_{ij} . ($-100 \leq C_{ij} \leq 100$). S_i and S_j are different strings, and must be in the previous 23 names. All the (S_i, S_j) pairs are different.

Output

Output one line for each test case, indicating the maximum total ability values, that is, the total ability values of the 11 persons plus the additional effects. If you cannot choose a 4-4-2 formation, output 'impossible' instead.

Sample Input

```
Buffon 90 goalkeeper
De_Sanctis 80 goalkeeper
Marchetti 80 goalkeeper
Zambrotta 90 defender
Cannavaro 90 defender
Chiellini 90 defender
Maggio 90 defender
Bonucci 80 defender
Criscito 80 defender
Bocchetti 80 defender
Pirlo 90 midfielder
Gattuso 90 midfielder
De_Rossi 90 midfielder
Montolivo 90 midfielder
Camoranesi 80 midfielder
Palombo 80 midfielder
Marchisio 80 midfielder
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Pepe 80 midfielder
Iaquinta 90 striker
Di_Natale 90 striker
Gilardino 80 striker
Quagliarella 80 striker
Pazzini 80 striker
1
Pirlo Quagliarella 50

ZhangSan01 50 goalkeeper
ZhangSan02 50 defender
ZhangSan03 50 defender
ZhangSan04 50 defender
ZhangSan05 50 defender
ZhangSan06 50 defender
ZhangSan07 50 defender
ZhangSan08 50 defender
ZhangSan09 50 defender
ZhangSan10 50 defender
ZhangSan11 50 defender
ZhangSan12 50 defender
ZhangSan13 50 defender
ZhangSan14 50 defender
ZhangSan15 50 defender
ZhangSan16 50 midfielder
ZhangSan17 50 midfielder
ZhangSan18 50 midfielder
ZhangSan19 50 midfielder
ZhangSan20 50 midfielder
ZhangSan21 50 midfielder
ZhangSan22 50 midfielder
ZhangSan23 50 midfielder
0

Sample Output

1030
impossible