You have been hired to arrange the seating of diplomats at a dinner party. Your employer has invited 9 diplomats from several countries around the world. Each diplomat will speak from one to five languages. Diplomats not speaking a common language can not talk to each other. Furthermore, some of the countries represented will not have diplomatic relations with other nations represented, so these diplomats will not be speaking to each other either. Your task is to determine the seating arrangement at the dinner table for your employer and the 9 guests such that each person can speak to the person seated on each side.

The table to be used for dinner is round, and seats 10 people. Your employer will be seated at the first position at the table. The other positions will be numbered clockwise from 2 to 10. The person seated to the left of your employer is in seat number 2, the person seated to the right of your employer is in seat number 10.

Persons seated next to each other must speak a common language. A person may speak to the person on the left in one common language, and speak to the person on the right in another language.

The governments of the guests seated next to each other must have formally recognized each other. The government of your employer has diplomatic relations with the governments of all of his guests. The government of a guest may or may not have diplomatic relations with the governments of all the other guests.

Two diplomats from the same country will have diplomatic relations with the same list of countries. A country will always have diplomatic relations with itself. Diplomats from the same country may or may not speak any languages in common.

Input

Input to the program will contain several data sets. Each data set will be a list of ten people, one per line, ended by a blank line.

Input to the program will be a list of ten people, one per line, ended by end-of-file. The first line will represent your employer, the other lines will represent the guest diplomats. Each line consists of a sequence of words, where words are separated by a single space. Each word is a sequence of capitals. The first word consists of 3 characters and represents the code for the guest's country. The second word contains 1 to 5 characters and represents the languages that the guest speaks. Each language that the guest speaks is represented by a single letter. Finally, there is a list of up to 9 three-character words representing the codes of the countries of the other guests that this guest's government has diplomatic relations with.

Output

Output of each data set is a table of the seating arrangement. It contains one diplomat per line. Each line starts with the seat number followed by three words, all separated by single spaces. The first word is the language code for the person seated on the left. The second word is the country code for the diplomat. The third word is the language code for the person seated on the right. The seating arrangement should be printed in the order 1 to 10, and no blank line should appear after line 10.

More than one solution may exist, but you need find only one.

If no solution is found, output the sentence

```
NO SOLUTION EXISTS
```

Sample Input

```
USA EF CHN GBR USR FRA FRG JPN ISR POR KOR
CHN CFE USA GBR FRA FRG
GBR ER USA CHN USR FRA FRG JPN ISR POR KOR
USR RF USA GBR FRA FRG
FRA F USA CHN GBR USR FRG JPN ISR POR
FRG ERG USA CHN GBR USR FRA JPN ISR POR
JPN JHG USA GBR FRA FRG JPN ISR POR KOR
ISR HER USA GBR FRA FRG JPN KOR
POR PGE USA GBR FRA FRG JPN
KOR KEC USA GBR USR JPN ISR

TLC ADBE TQA DAO FHH NUW FAB PSR FEQ QPA KCW
TQA EB TLC DAO PSR FEQ KCW
DAO B TLC TQA FHH FAB PSR FEQ QPA KCW
FHH B TLC DAO PSR KCW
NUW DBE TLC
FAB D TLC DAO PSR FEQ QPA
PSR AC TLC TQA DAO FHH FAB QPA
FEQ CB TLC TQA DAO FAB QPA
QPA D TLC DAO FAB PSR FEQ KCW
KCW AE TLC TQA DAO FHH QPA
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Sample Output

```
1 F USA E
2 E CHN E
3 E GBR E
4 E KOR E
5 E ISR H
6 H JPN G
7 G POR E
8 E FRG R
9 R USR F
10 F FRA F

NO SOLUTION EXISTS
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