5_橋牌 - Bridge

(20分)

問題敘述

橋牌，一種風靡在世界上的紙牌遊戲，因為規則複雜而帶有競技性受到許多人歡迎。今天精誠企業辦了一場比賽，但比完賽後發現他們忘記統計成績而只留有紀錄因此希望由你幫忙復原比賽過程

具體而言，每場比賽的資料分成以下兩部分

叫牌:叫牌決定主打方及最後的合約。主打方的其中一人被稱作「莊家」，而會主打這一牌，另一位則會成為不做事的「夢家」。最後的合約也可能被（防守方）賭倍或（主打方）再賭倍。
在叫牌中，每個玩家在輪到自己時都可以做出以下其中一種「叫品」：

1. 叫價：宣告叫品的線位及花色，也可稱為「實質性叫品」。
2. 賭倍：當最後一個非派司的叫品是由敵方叫出。
3. 再賭倍：當最後一個非派司的叫品是敵方的賭倍。
4. 派司:不想做出以上三種叫品時，亦即棄權。

叫牌由發牌人開始，每個玩家依序順時鐘輪流叫出一個叫品。當出現連續三個派司後(或是開場連續四個PASS)，叫牌即結束。

「叫價」會指定線位和花色，所以指示了一個想打某合約的提議。想叫牌的玩家必須叫出比前一個叫品更高的叫品。所謂比較高的叫品，是指叫品的線位較高，或是在同一線位上，且花色的等級較高(NT>S>H>D>C)。因此在3H這個叫品之後，不能叫2S或3C，但可以叫3NT(無王)或4D 。
叫牌結束後，最後一個叫價（以及其後的賭倍和再賭倍）便成為合約，其線位決定達成合約所需的磴數，而花色則決定所使用的王牌，其中NT為無王合約，因此不存在王牌。
沒有贏得合約的搭檔叫「防家」。叫出最後叫價的一對還要細分：整個叫牌過程中首先叫出最後合約所屬花色的一方成為「莊家」，他的同伴則是「夢家」。
合約的線位是一個特定的目標。莊家必須想辦法拿到六加上他所喊的現為磴數才能「完成」合約。反之，我們就說防家「擊垮」了合約。

打牌:
打牌的步驟有十三磴，每一磴包含每位玩家手中的一張牌。A 在橋牌中最大，接著依序是 K、Q、J、T、9 等等，每個花色牌組中最小的牌是 2。一磴中最先出的一張牌稱作「引牌」，接著玩家順時鐘方向依序出牌。引牌可以是手上的任何一張牌，但其他的牌則必須打出和引牌同樣花色的牌，除非他們已經沒有該花色的牌。打出該磴最大牌張的玩家贏得這一磴，除非其他玩家的出牌中有王牌，在後者的狀況中則由打出最大王牌的玩家贏得此磴。贏得此磴的玩家在下一磴可以引牌，直到所有牌打完。
第一張引牌稱作「首引」（首攻），是由莊家左手方的防家出牌。

輸入

輸入第一行有一個整數 T，代表總共有 T 場牌局的資料還原
之後會有 T 局牌局得資料，每局牌局由若干行組成，其中第一行是單一一個字母，代表第一個喊出叫品的方位(順時針方向依序為 N、E、S、W)，之後會有若干行，分別代表依序的叫牌過程，每行一組，其中叫牌的表示方法如下

1. 叫價：XY。
2. 賭倍: `X`。
3. 再賭倍：`XX`。
4. 派司: `PASS`。

   並保證叫牌過程會以三或四個 `PASS` 結束。

   如果叫牌過程為四個 `PASS` (亦即沒進行該複牌局)，則不會有打牌過程，否則打牌過程格式如下:

   在打牌過程會有 13 行，每行 4 個字串，依序代表那一輪首引玩家按照順時鐘方向的出牌，字串形式為 MN，其中 M 為那張牌的花色，N 為那張牌的數字。

輸出

對於每一副牌，如果該局為四個 `PASS` ，請輸出 `ALL PASS` ，

否則如果該局如果不合法，代表主辦單位紀錄出錯，請輸出 `error` ，具體而言不合法狀況如下:

1. 叫牌過程錯誤:

   1. 叫價並沒有比上一個叫價高。
   2. 對非對手的叫價賭倍。
   3. 對非對手的賭倍再賭倍。

2. 打牌過程錯誤如下:

   1. 有張牌在牌局出現超過一次。
   2. 有人在打牌時應跟首引花色而未跟。

否則請輸出該局最終合約、莊家方位、最終結果。

最終合約格式如同輸入，賭倍與再賭倍請直接在後面加上 `X` 或 `XX`。

例如: `4HX` 代表 $4H$ 賭倍，`3NTXX` 代表 $3NT$ 再賭倍，莊家方位為單一字母，最終結果如果合約洽完成請輸出 `=` ，否則輸出 $+X$，如果莊家多吃 X 敦或是 $-X$，如果莊家少吃 X 敦。

資料範圍

- $1 \le T \le 100$。
- $1 \le X \le 7$。
- Y 為 `C`,`D`,`H`,`S`,`NT` 其中之一。
- M 為 `C`,`D`,`H`,`S` 其中之一。
- N 為 `A`,`K`,`Q`,`J`,`T`,`9`,`8`,`7`,`6`,`5`,`4`,`3`,`2` 其中之一。

範例輸入 1

```
1
N
PASS
PASS
PASS
PASS
```

範例輸出 1

```
ALL PASS
```

範例1說明

四家都 PASS，因此輸出 ALL PASS

範例輸入 2

```
3
E
1C
1NT
2C
PASS
PASS
PASS
C2 C3 C4 CA
CK C5 C6 C7
CQ C8 C9 CT
CJ S2 S3 S4
SA S5 S6 S7
SK S8 S9 ST
SQ SJ H2 H3
HA H4 H5 H6
H7 HK H8 H9
HQ HJ HT D2
DA D3 D4 D5
DK D6 D7 D8
DQ D9 DT DJ
S
1C
X
PASS
PASS
PASS
C2 C3 C4 CA
CK C5 C6 C7
CQ C8 C9 CT
CJ S2 S3 S4
SA S5 S6 S7
SK S8 S9 ST
SQ SJ H2 H3
HA H4 H5 H6
H7 HK H8 H9
```

```
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
W
3C
X
XX
PASS
PASS
PASS
C2  C3  C4  CA
CK  C5  C6  C7
CQ  C8  C9  CT
CJ  S2  S3  S4
SA  S5  S6  S7
SK  S8  S9  ST
SQ  SJ  H2  H3
HA  H4  H5  H6
H7  HK  H8  H9
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
```
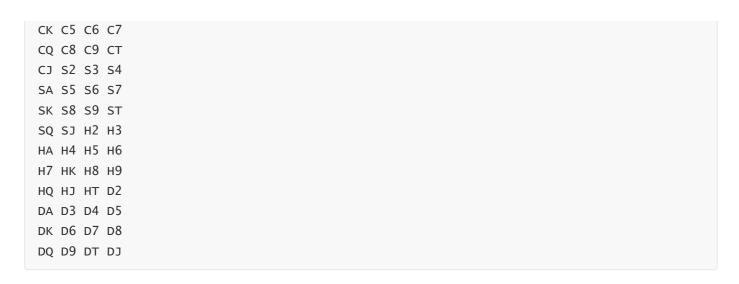
範例輸出 2

```
2CE=
1CXS+1
3CXXW-1
```

範例2說明

在第1局中，雖然最後訂約的 2C 是 W 家所喊，但因為第一個叫出 C 的是 E，因此莊家仍為 E 家。
第1到3局中皆為主打方拿到前面八墩。

範例輸入 3

```
1
E
1C
XX
PASS
PASS
PASS
C2  C3  C4  CA
```

```
CK  C5  C6  C7
CQ  C8  C9  CT
CJ  S2  S3  S4
SA  S5  S6  S7
SK  S8  S9  ST
SQ  SJ  H2  H3
HA  H4  H5  H6
H7  HK  H8  H9
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
```

範例輸出 3

```
error
```

範例3說明

因為 S 家對非對手的賭倍再賭倍，因此為 error。

5_Bridge

(20 points)

Description

Bridge, a kind of well-known poker game in the world, is popular for the complex rules and competitiveness. Today, Jinchen company held a Bridge game. When the game finished, they found they forget to count the score, so they only have the record and want you to recover the score.

Every game's record data has two part of the following.

Auction: Decide which pair to play and the final contract. One of these pairs will be the "declarer" who plays this game and the other will be the "dummy" who doesn't need to do anything. And the final contract would be (defender) double or (declarer or dummy) redouble.
In the Auction, every player can do one of the following "call" in his/her round.

1. bid: Specifying the level of their contract and either the trump suit or no trump (the denomination)
2. double: when the last not pass call is the opponent's bid
3. redouble: when the last not pass call is the opponent's double
4. pass: when you don't want to do the 3 calls below

The auction starts with one of the players, every player call one by one in the clockwise direction. Finish when three continuous pass (or four continuous pass in the start).

"Bid" will Specify the level of their contract and either the trump suit or no trump (the denomination), which suggests the wondering contract he/she wants to play. The player who wants to call a bid must be higher than the last bid last which means the level is higher or the level is equal but the suit is better (NT>S>H>D>C). So after 3C, you can't call 2S or 3C but you can call 3NT(no-trump).
When the auction finish, the last bid(and the double or redouble) will be the contract. The level will decide how many tricks they need to win, and the suit decides the trump, and NT is no-trump contract, so there doesn't have trump.
The partner who doesn't get a contract is called a defender, and the partner who gets a contract has to be a subdivision, the one who first calls the contract suit in the all Auction call declarer, and the other call dummy.
To finish the contract, The declarer needs to win 6+level or we say the defender beat down the contract.

Play:
There are 13 tricks in one game, every trick includes one of the cards for every four people. In the Bridge game the number is A>K>Q>J>T>9>8>7>6>5>4>3>2. The first card in one trick is called "lead", and then the player play cards in a clockwise direction. The lead card can be one of the cards in hand, but other players must play the card whose suit is the same as the lead card unless they don't have it. The one who plays the higher card with the lead suit wins this trick unless there are trump-suit cards in this trick, then the one who plays the higher card with the trump-suit win. The player wins this card will be the next trick's lead.
The first trick's lead is played from the declarer's left.

Input Format

There is one integer T in the first line, which means you have to count the T bridge game.

There are T bridge game's data follow. In every game, the first line has one letter, which means the first player to call(N, E, W, S in a clockwise direction). And then have a few lines, the call auction.

1. bid : XY。
2. double: `x`。
3. redouble : `XX`。
4. pass: `PASS`。

And call auction finishes with 3 or 4 `PASS`.

If there are 4 `PASS` (they don't play that game), we don't have the play data. Or the play data show the following.

There are 13 lines, each line with 4 strings which means the card plays in a clockwise direction and begins with the lead player in that trick. The card is shown by MN, M is the suit, N is the number.

Output Format

For every game, if it begins with 4 `PASS` ，Please out put `ALL PASS`.

Or is that game illegal which means the data is wrong, please output `error`.The following case is illegal.

1. call auction is illegal:

    1. the bid doesn't higher than the last bit.
    2. call double but the last not pass call is not the opponent's bid
    3. call redouble but the last not pass call is not the opponent's double
2. play is illegal:

    1. some cards appear more than one time.
    2. you have the card with the lead suit but play the other suit's card.

Or output the final contract, who is declarer(show with position), the final result.
the final contract is shown the same as input, double, and redouble just add `x` or `xx` after the final contract.
EX: `4HX` means double to $4H$, `3NTXX` means redouble to $3NT$

The position of declarer is one letter.
If the declarer just finishes the contract(win 6+level tricks),please output `=`, or output $+X$ the number declarer win over 6+level, or output $-X$ the number declarer less than 6+level.

Constraints

- $1 \le T \le 100$.
- $1 \le X \le 7$.
- Y is one of `C`, `D`, `H`, `S`, `NT`.
- M is one of `C`, `D`, `H`, `S`.

- N is one of `A`, `K`, `Q`, `J`, `T`, `9`, `8`, `7`, `6`, `5`, `4`, `3`, `2`.

Sample Input 1

```
1
N
PASS
PASS
PASS
PASS
```

Sample Output 1

```
ALL PASS
```

Sample1 Explanation

four players all PASS at begin, so the output is `ALL PASS`

Sample Input 2

```
3
E
1C
1NT
2C
PASS
PASS
PASS
C2 C3 C4 CA
CK C5 C6 C7
CQ C8 C9 CT
CJ S2 S3 S4
SA S5 S6 S7
SK S8 S9 ST
SQ SJ H2 H3
HA H4 H5 H6
H7 HK H8 H9
HQ HJ HT D2
DA D3 D4 D5
DK D6 D7 D8
DQ D9 DT DJ
S
1C
```

```
X
PASS
PASS
PASS
C2  C3  C4  CA
CK  C5  C6  C7
CQ  C8  C9  CT
CJ  S2  S3  S4
SA  S5  S6  S7
SK  S8  S9  ST
SQ  SJ  H2  H3
HA  H4  H5  H6
H7  HK  H8  H9
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
W
3C
X
XX
PASS
PASS
PASS
C2  C3  C4  CA
CK  C5  C6  C7
CQ  C8  C9  CT
CJ  S2  S3  S4
SA  S5  S6  S7
SK  S8  S9  ST
SQ  SJ  H2  H3
HA  H4  H5  H6
H7  HK  H8  H9
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
```

Sample Output 2

```
2CE=
1CXS+1
3CXXW-1
```

Sample2 Explanation

In the first game, though 2C is called by the west player, the first one who called C in the E-W pair is the east player, so the declarer is the East player
In the first to the third game, the declarer pair get the first 8 tricks.

Sample Input 3

```
1
E
1C
XX
PASS
PASS
PASS
C2  C3  C4  CA
CK  C5  C6  C7
CQ  C8  C9  CT
CJ  S2  S3  S4
SA  S5  S6  S7
SK  S8  S9  ST
SQ  SJ  H2  H3
HA  H4  H5  H6
H7  HK  H8  H9
HQ  HJ  HT  D2
DA  D3  D4  D5
DK  D6  D7  D8
DQ  D9  DT  DJ
```

Sample Output 3

```
error
```

Sample3 Explanation

The South player redouble to not opponent's double, so must output `error`.