Greetings From Globussoft

- Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.

- These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP

- To solve these 3 questions you've max. 3 hours.

- While Solving these questions you are not allowed to use any Search Engine like Google, Yahoo, Bing …

All the best for your test

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QUESTION - 1

The description of this problem is extremely simple. You are given **2 non-intersecting circles** in 3-dimensional world. Each of the circle is defined by **3 non - collinear points** lying on the circle. All you have to return is whether the circles are entangled or not (just like two links of a chain). Two circles are entangled if they cannot be separated from each other without breaking any of the circles.

Input Format:

The first line contains a single integer, **T**, the number of test cases. Each of the **T** test cases are defined by **2** lines. The first line of each test case contains **9** integers representing the **3** points as **(x1, y1, z1), (x2, y2, z2), (x3, y3, z3)** which define the first circle. Similarly, the second line for each test case contains **9** integers representing the **3** points which define the second circle.

Output Format:

For every query output **"YES"** without quotes if the circles are entangled and **"NO"** otherwise (quotes for clarity).

Constraints:

1 ≤ T ≤ 100
-10000 ≤ Each Coordinate in the Input ≤ 10000

Sample Input:

```
1
0 1 0 1 0 0 0 -1 0
0 0 0 1 0 -1 1 0 1
```

Sample Output:

```
YES
```

QUESTION – 2

J. R. R. Tolkien decided to make Thorin Oakenshield's task more difficult. This time he was given an infinite number of keys represented by a small string. The hidden entrance has a lot of keyholes side by side represented by one long string. The key fits only into a slit that matches it completely. Oakenshield does not know how many keys he would require and which all keyholes he will have to try out. So if there are **n** keyholes where the key fits, he might need any number of keys between **1 to n** (both inclusive). Moreover he does not know which keyholes among the ones where the keys fit, he will have to use. All he knows is that there is a unique way

to open the door. Trying out each configuration takes **1** second. The last light of Durin's day does not last long and will have to try out all possibilities before it goes. He wants you to find out how long, in the worst case, it will take for him to try out all possibilities.

Since the answers may be huge, output it modulo **1000000007**. If there are no keyholes where the key fits, output **0**.

Input Format:

First line containing a string representing the key. Second line containing a string representing the keyholes.

Output Format:

Single line containing an integer for the required answer.

Notes:

1. Key fits into a keyhole at index **i** if key is a substring of keyhole string at index **i**.
2. If there are two overlapping keyholes where the key may fit, you cannot insert a key in both simultaneously

Constraints:

1 ≤ key ≤ 10^4
1 ≤ keyholes ≤ 5*(10^5)

Sample Input:

```
c
a
```

Sample Output:

```
0
```

Sample Input:

```
aba
abababa
```

Sample Output:

```
4
```

QUESTION – 3

The Avengers become divided, both over how to approach Loki and the revelation that S.H.I.E.L.D. plans to harness the Tesseract to develop weapons as a deterrent against hostile extraterrestrials. The argument is raised between Captain America, Iron man and Thor each having his own point to keep. Agent Natasha Romanoff comes up with a non-violent solution to this argument by suggesting a variant of the game of chess for three players. This time chessboard contains only a knight, a rook and a bishop. In this game, first Captain America takes his turn, next Iron Man and then Thor. After Thor's turn, this sequence repeats.

- Captain America can only move knight, Iron Man rook, and Thor bishop and each player can move their respective piece to an empty position.
- The rook can move any number of squares horizontally or vertically, but may not leap over other pieces.
- The bishop can move any number of squares diagonally, but may not leap over other pieces.
- The knight' move forms an "L"-shape: two squares vertically and one square horizontally, or two squares horizontally and one square vertically. The knight is the only piece that can leap over other pieces.

The objective of game is to place rook at the initial position of knight, bishop at initial position of rook and knight at initial position of bishop. That is, if the initial position of knight, rook and bishop is **(x1, y1), (x2, y2)** and **(x3, y3)**, respectively, then the final position of them should be **(x3, y3), (x1, y1), (x2, y2)** respectively.

Input

The first line of the input contains an integer T denoting the number of test cases.
Each test case consists of exactly one line containing 6 space separated integers **x1 y1 x2 y2 x3 y3**.
x1 y1 represents the initial position of Knight.
x2 y2 represents the initial position of Rook.
x3 y3 represents the initial position of Bishop.

- T=5
- $0 \le x1, y1 \le 7$
- $0 \le x2, y2 \le 7$
- $0 \le x3, y3 \le 7$
- No pair of initial positions are equal, i.e., (x1, y1) != (x2, y2) && (x1, y1) != (x3, y3) && (x2, y2) != (x3, y3)

Output

For each test case, print the minimum number of turns required to achieve this objective.

If the desired configuration is not reachable print -1.

Example

```
Input:
1
0 0 5 1 3 3

Output:
5
```

QUESTION – 4

Pranjali and Nancy are playing an amazing game. The game starts with a string of bits (i.e. string of 0's and 1's). Game progresses in the form of right to left bit by bit scans. Pranjali takes turn when a "1" bit comes while scanning the string and Nancy takes turn when a "0" bit comes while scanning. In their respective turns, they can either choose to toggle their bit or keep it unchanged. The goal is to make all bits 0 at the end of scan, failing which means the scanning starts again from right to left. If all the bits are 0 at the end of a scan, the game ends and Pranjali is declared a winner. There is no win for Nancy. The game either ends to the goal described or the scanning continues indefinitely. So it can be seen that Pranjali has to win the game and in an optimal number of scans whereas Nancy's aim is to not let Pranjali win (by making it an indefinite play) or to delay Pranjali's win if it's sure. So now assuming that they both play with their optimal strategy, can you please tell if Pranjali can win the game or not?

Note: There has to be AT LEAST 1 scan before the game can end.

Input

First line contains T, the number of test cases.

Each of the next T lines contains a string of 0's and 1's.

Output

For each string given in the input, output either "WIN m", without quotes, if Pranjali can force her win in "m" scans in an optimal play, or output "INFINITE PLAY" if the game cannot be reached to the above mentioned goal in an optimal play.

Constraints

1<=T<=20

1<= Length of string <=50

Example

```
Input:
2
1
10

Output:
WIN 1
WIN 2
```

QUESTION – 5

Ramesh and Suresh get a box full of five stars on lottery each. Since both the boxes need not have the same number of chocolates, they decide to play a game. The winner gets to have both the boxes of chocolates. They play alternatively and Suresh starts the game.

Given the number of chocolates in both the boxes, let them be c1 and c2, the player takes either c1 or c2 number of chocolates and divide the remaining box of chocolates to two boxes (these two boxes need not have the same number of chocolates). The player who cannot make such a move loses.

Given the initial number of chocolates (c1 and c2) find the winner.Assume both the players play optimally.

Input

First line of input contains a number T(1<=T<=1000), the number of test cases. Then follows T lines each containing two space separated integers c1 and c2

(1<=c1<=c2<=10000).

Output

For each test case print "Ramesh" or "Suresh" depending on who is the winner.

Example

```
Input:
2
3 1
```

4 5

Output:
Ramesh
Suresh