Codeforces Round #281 (Div. 2)

A. Vasya and Football

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya has started watching football games. He has learned that for some fouls the players receive yellow cards, and for some fouls they receive red cards. A player who receives the second yellow card automatically receives a red card.

Vasya is watching a recorded football match now and makes notes of all the fouls that he would give a card for. Help Vasya determine all the moments in time when players would be given red cards if Vasya were the judge. For each player, Vasya wants to know only the **first** moment of time when he would receive a red card from Vasya.

Input

The first line contains the name of the team playing at home. The second line contains the name of the team playing away. Both lines are not empty. The lengths of both lines do not exceed 20. Each line contains only of large English letters. The names of the teams are distinct.

Next follows number n $(1 \leq n \leq 90)$ — the number of fouls.

Each of the following n lines contains information about a foul in the following form:

- first goes number t $(1 \leq t \leq 90)$ — the minute when the foul occurs;
- then goes letter "h" or letter "a" — if the letter is "h", then the card was given to a home team player, otherwise the card was given to an away team player;
- then goes the player's number m $(1 \leq m \leq 99)$;
- then goes letter "y" or letter "r" — if the letter is "y", that means that the yellow card was given, otherwise the red card was given.

The players from different teams can have the same number. The players within one team have distinct numbers. The fouls go chronologically, no two fouls happened at the same minute.

Output

For each event when a player received his first red card **in a chronological order** print a string containing the following information:

- The name of the team to which the player belongs;
- the player's number in his team;
- the minute when he received the card.

If no player received a card, then you do not need to print anything.

It is possible case that the program will not print anything to the output (if there were no red cards).

Sample test(s)

input
MC CSKA 9 28 a 3 y 62 h 25 y 66 h 42 y 70 h 25 y 77 a 4 y 79 a 25 y 82 h 42 r 89 h 16 y 90 a 13 r

output
MC 25 70 MC 42 82 CSKA 13 90

B. Vasya and Wrestling

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya has become interested in wrestling. In wrestling wrestlers use techniques for which they are awarded points by judges. The wrestler who gets the most points wins.

When the numbers of points of both wrestlers are equal, the wrestler whose sequence of points is **lexicographically greater**, wins.

If the sequences of the awarded points coincide, the wrestler who performed the last technique wins. Your task is to determine which wrestler won.

Input

The first line contains number n — the number of techniques that the wrestlers have used ($1 \le n \le 2 \cdot 10^5$).

The following n lines contain integer numbers a_i ($|a_i| \le 10^9$, $a_i \ne 0$). If a_i is positive, that means that the first wrestler performed the technique that was awarded with a_i points. And if a_i is negative, that means that the second wrestler performed the technique that was awarded with $(-a_i)$ points.

The techniques are given in chronological order.

Output

If the first wrestler wins, print string "`first`", otherwise print "`second`"

Sample test(s)

input
5 1 2 -3 -4 3
output
second

input
3 -1 -2 3
output
first

input
2 4 -4
output
second

Note

Sequence $x = x_1 x_2 \ldots x_{|x|}$ is **lexicographically larger** than sequence $y = y_1 y_2 \ldots y_{|y|}$, if either $|x| > |y|$ and $x_1 = y_1, x_2 = y_2, \ldots, x_{|y|} = y_{|y|}$, or there is such number r ($r < |x|, r < |y|$), that $x_1 = y_1, x_2 = y_2, \ldots, x_r = y_r$ and $x_{r+1} > y_{r+1}$.

We use notation $|a|$ to denote length of sequence a.

C. Vasya and Basketball

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya follows a basketball game and marks the distances from which each team makes a throw. He knows that each successful throw has value of either 2 or 3 points. A throw is worth 2 points if the distance it was made from doesn't exceed some value of d meters, and a throw is worth 3 points if the distance is larger than d meters, where d is some **non-negative** integer.

Vasya would like the advantage of the points scored by the first team (the points of the first team minus the points of the second team) to be maximum. For that he can mentally choose the value of d. Help him to do that.

Input

The first line contains integer n ($1 \le n \le 2 \cdot 10^5$) — the number of throws of the first team. Then follow n integer numbers — the distances of throws a_i ($1 \le a_i \le 2 \cdot 10^9$).

Then follows number m ($1 \le m \le 2 \cdot 10^5$) — the number of the throws of the second team. Then follow m integer numbers — the distances of throws of b_i ($1 \le b_i \le 2 \cdot 10^9$).

Output

Print two numbers in the format `a:b` — the score that is possible considering the problem conditions where the result of subtraction a - b is maximum. If there are several such scores, find the one in which number a is maximum.

Sample test(s)

input
3 1 2 3 2 5 6
output
9:6

input
5 6 7 8 9 10 5 1 2 3 4 5
output
15:10

D. Vasya and Chess

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya decided to learn to play chess. Classic chess doesn't seem interesting to him, so he plays his own sort of chess.

The queen is the piece that captures all squares on its vertical, horizontal and diagonal lines. If the cell is located on the same vertical, horizontal or diagonal line with queen, and the cell contains a piece of the enemy color, the queen is able to move to this square. After that the enemy's piece is removed from the board. The queen cannot move to a cell containing an enemy piece if there is some other piece between it and the queen.

There is an $n \times n$ chessboard. We'll denote a cell on the intersection of the r-th row and c-th column as (r, c). The square $(1, 1)$ contains the white queen and the square $(1, n)$ contains the black queen. All other squares contain green pawns that don't belong to anyone.

The players move in turns. The player that moves first plays for the white queen, his opponent plays for the black queen.

On each move the player has to capture some piece with his queen (that is, move to a square that contains either a green pawn or the enemy queen). The player loses if either he cannot capture any piece during his move or the opponent took his queen during the previous move.

Help Vasya determine who wins if both players play with an optimal strategy on the board $n \times n$.

Input

The input contains a single number n ($2 \le n \le 10^9$) — the size of the board.

Output

On the first line print the answer to problem — string "white" or string "black", depending on who wins if the both players play optimally.

If the answer is "white", then you should also print two integers r and c representing the cell (r, c), where the first player should make his first move to win. If there are multiple such cells, print the one with the minimum r. If there are still multiple squares, print the one with the minimum c.

Sample test(s)

input
2

output
white 1 2

input
3

output
black

Note

In the first sample test the white queen can capture the black queen at the first move, so the white player wins.

In the second test from the statement if the white queen captures the green pawn located on the central vertical line, then it will be captured by the black queen during the next move. So the only move for the white player is to capture the green pawn located at $(2, 1)$.

Similarly, the black queen doesn't have any other options but to capture the green pawn located at $(2, 3)$, otherwise if it goes to the middle vertical line, it will be captured by the white queen.

During the next move the same thing happens — neither the white, nor the black queen has other options rather than to capture green pawns situated above them. Thus, the white queen ends up on square $(3, 1)$, and the black queen ends up on square $(3, 3)$.

In this situation the white queen has to capture any of the green pawns located on the middle vertical line, after that it will be captured by the black queen. Thus, the player who plays for the black queen wins.

E. Vasya and Polynomial

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya is studying in the last class of school and soon he will take exams. He decided to study polynomials. *Polynomial* is a function $P(x) = a_0 + a_1x^1 + ... + a_nx^n$. Numbers a_i are called *coefficients* of a polynomial, non-negative integer n is called a *degree* of a polynomial.

Vasya has made a bet with his friends that he can solve any problem with polynomials. They suggested him the problem: "Determine how many polynomials $P(x)$ exist with **integer non-negative** coefficients so that $P(\mathbf{t}) = a$, and $P(P(\mathbf{t})) = b$, where $\mathbf{t}$, a and b are given positive integers"?

Vasya does not like losing bets, but he has no idea how to solve this task, so please help him to solve the problem.

Input

The input contains three integer positive numbers $\mathbf{t}, a, b$ no greater than 10^{18}.

Output

If there is an infinite number of such polynomials, then print "`inf`" **without quotes**, otherwise print the reminder of an answer modulo $10^9 + 7$.

Sample test(s)

input
2 2 2
output
2

input
2 3 3
output
1