

Mukjjippa

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 1024 mebibytes

Two players A and B are playing a game called **mukjjippa**.

The game consists of several turns.

At the i -th turn ($1 \leq i \leq n$):

- Each player chooses exactly one from $\{R, S, P\}$ (meaning rock, scissors, and paper, respectively).
- Let X_i and Y_i be the choices of A and B, respectively.
- If $(X_i, Y_i) \in \{(R, S), (S, P), (P, R)\}$, then A becomes an attacker for the $(i+1)$ -th turn and the game continues.
- Otherwise, if $(X_i, Y_i) \in \{(R, P), (S, R), (P, S)\}$, then B becomes an attacker for the $(i+1)$ -th turn and the game continues.
- Otherwise, if there is an attacker for the i -th turn, then the attacker becomes a winner and the game ends.
- Otherwise, there is no attacker for the $(i+1)$ -th turn and the game continues.

Note that there is no attacker for the first turn.

If the game does not end until the beginning of the $(n+1)$ -th turn, nobody is a winner.

The probability distribution of each choice is given. All choices are independent.

Find the probability that A wins.

Input

The first line contains an integer n .

The i -th of the next n lines contains three integers r_i , s_i , and p_i . This means that the probabilities that X_i is R, S, and P are $\frac{r_i}{r_i+s_i+p_i}$, $\frac{s_i}{r_i+s_i+p_i}$, and $\frac{p_i}{r_i+s_i+p_i}$, respectively.

The i -th of the next n lines contains three integers r'_i , s'_i , and p'_i . This means that the probabilities that Y_i is R, S, and P are $\frac{r'_i}{r'_i+s'_i+p'_i}$, $\frac{s'_i}{r'_i+s'_i+p'_i}$, and $\frac{p'_i}{r'_i+s'_i+p'_i}$, respectively.

Output

Let $\frac{x}{y}$ be the probability that A wins, where x and y are coprime integers, and $x \geq 0$ and $y > 0$.

Print the integer z such that $yz \equiv x \pmod{998\,244\,353}$ and $0 \leq z < 998\,244\,353$.

It can be proved that such an integer z always exists and is uniquely determined, under the constraints of this problem.

Scoring

- $1 \leq n \leq 2 \times 10^5$
- $0 \leq r_i, s_i, p_i \leq 10^6$ ($1 \leq i \leq n$)
- $r_i + s_i + p_i > 0$ ($1 \leq i \leq n$)

- $0 \leq r'_i, s'_i, p'_i \leq 10^6$ ($1 \leq i \leq n$)
- $r'_i + s'_i + p'_i > 0$ ($1 \leq i \leq n$)

Examples

standard input	standard output
<pre>2 1 0 0 0 1 0 0 1 0 0 1 0</pre>	<pre>1</pre>
<pre>2 1 1 1 1 1 1 1 1 1 1 1 1</pre>	<pre>443664157</pre>