Problem A. 夢の中で逢った、ような……

Time limit 3500 ms
Memory limit 256MB

Problem Description

Fig 1. ouo

With her beloved family and friends, laughing and crying at times, Kaname Madoka, a second-year middle school student, spends her peaceful daily life. One night, she had a very incredible dream.

What was supposed to be another ordinary day turned into something extraordinary. A transfer student, Akemi Homura, joins Madoka's class. This girl looks exactly like the one Madoka saw in her dream. Confused by this uncanny resemblance, Madoka hears Homura say some profound words...

Madoka dreamed that Homura told her a problem, which is as follows:
Given a, b, x_0, y_0, x_1, y_1, find $(\sum_{i=x_0}^{x_1} \sum_{j=y_0}^{y_1} A_{i,j}^{(20110107)}) \bmod 998244353$.
$A^{(1)} = \begin{bmatrix} 1 \end{bmatrix}$.
$A^{(k+1)}$ is defined as follows:

$$A_{r,c}^{(k+1)} = \begin{cases} A_{r,c}^{(k)}, & \text{if } 1 \le r \le 2^k \text{ and } 1 \le c \le 2^k \\ a \cdot A_{r-2^k,c}^{(k)}, & \text{if } 2^k < r \le 2^{k+1} \text{ and } 1 \le c \le 2^k \\ a \cdot A_{r,c-2^k}^{(k)}, & \text{if } 1 \le r \le 2^k \text{ and } 2^k < c \le 2^{k+1} \\ b \cdot A_{r-2^k,c-2^k}^{(k)}, & \text{if } 2^k < r \le 2^{k+1} \text{ and } 2^k < c \le 2^{k+1} \end{cases}$$

Input format

Each test contains multiple test cases. The first line contains the number of test cases $T(1 \leq T \leq 10^5)$. The description of the test cases follows.

The only line of each test case contains six integers a, b, x_0, y_0, x_1, y_1 $(0 \leq a, b \leq 10^9, 1 \leq x_0 \leq x_1 \leq 10^{18}, 1 \leq y_0 \leq y_1 \leq 10^{18})$.

Output format

For each test case, output a single integer.

Subtask score

Subtask	Score	Additional Constraints
1	2	sample
2	29	$T, x_1, y_1 \leq 128$
3	5	$x_1, y_1 \leq 1024$, All a's are equal, and all b's are equal
4	13	$x_0 = x_1 = 1$
5	8	$b = a^2$
6	21	$T \leq 10^3$, $x_1, y_1 \leq 10^5$
7	19	$T \leq 10^4$, $x_1, y_1 \leq 10^9$
8	3	No constraints

Sample

Sample Input 1

```
3
1 2 1 2 3 4
3 4 1 1 8 8
5 6 33 39 2617 831
```

Sample Output 1

```
13
1331
736152692
```

Notes

Fig 2. visualizes the recursion process above.

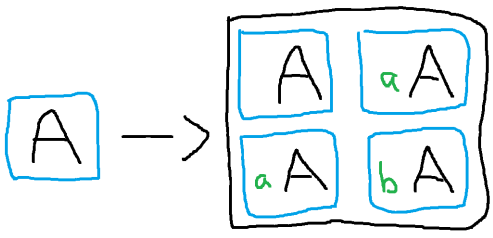

Fig 2. owo