2x2 Subgrid Sum Problem (hard)
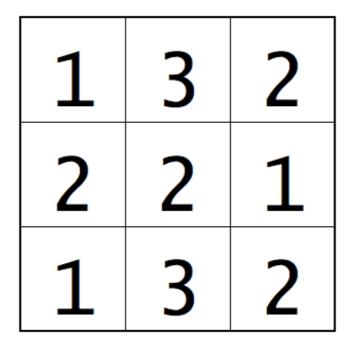
This problem is a higher constraints version of KWACIK (Polish) and GRIDSUM1.

You are given a 3x3 grid. You can place an integer m ($a \leq m \leq b$) in each cell.

How many ways are there to place integers in the cells such that the sum of each 2x2 subgrid is n?

Since the answer might be very large, output it modulo 10^8.

Input

The first line contains an integer T ($1 \leq T \leq 100$), the number of test cases.

On each of the next T lines, you are given three integers a, b and n. ($0 \leq a \leq b \leq 50000$, $0 \leq n \leq 200000$)

Output

For each test case, output a single line containing the number of ways to place integers modulo 10^8.

Example

Input:

```
1
1 2 5
```

Output:

Explanation

There are 8 ways to place integers for *a*=1, *b*=2 and *n*=5.

```
2 1 2 : 2 1 2 : 2 1 1 : 1 2 1 : 1 2 1 : 1 1 2 : 1 1 1 : 1 1 1
1 1 1 : 1 1 1 : 1 1 2 : 1 1 1 : 1 1 1 : 2 1 1 : 2 1 2 : 1 2 1
2 1 2 : 1 2 1 : 2 1 1 : 2 1 2 : 1 2 1 : 1 1 2 : 1 1 1 : 1 1 1
```

Credit & Special thanks

- [Bartek](#) - the original problem author
- [Mitch Schwartz](#)