

# Adventure

Rand has been sitting in a spaceship at the point  $(0,0,0)$  for a long time. One day, he got bored and decided to undertake an adventure.

Deciding upon an adventure has several complicated steps. First, Rand chooses a destination point  $(x,y,z)$  different from  $(0,0,0)$  such that  $0 \leq x \leq A$ ,  $0 \leq y \leq B$ ,  $0 \leq z \leq C$ . To go to this point, Rand travels in a straight line from the origin. As a result, he might encounter several other lattice points in the way. Each part of the journey between two consecutive lattice points encountered is called a phase. ( For example if  $(x,y,z)=(1,2,3)$  then there is only one phase  $(0,0,0) \rightarrow (1,2,3)$ , while if  $(x,y,z)=(3,0,3)$  then there are 3 phases  $(0,0,0) \rightarrow (1,0,1) \rightarrow (2,0,2) \rightarrow (3,0,3)$  ).

In each phase Rand chooses one of  $K$  different activities that he can undertake to pass the time. You need to calculate the total number of different adventures possible, modulo  $1000000007$  ( $1e9+7$ ). Two adventures are considered different if they have different destination points, or if the activity undertaken during any of the corresponding phases is different.

## Input

The first line contains the number  $T$ , the number of test cases.

$T$  lines follow, each contains the integers  $A,B,C,K$ , corresponding to one testcase

## Output

Output  $T$  lines, each with one integer as the answer for the corresponding test case.

## Constraints

$T \leq 1000$

$0 \leq A,B,C \leq 50000$

$1 \leq K \leq 10$

## Example

**Input:**

```
3
0 0 5 2
0 2 2 5
4 4 4 9
```

**Output:**

```
62
100
53388
```

## Explanation

In the first test case, if Rand chooses  $(0,0,1)$  as destination point, then there are 2 possible adventures. Similarly for  $(0,0,2)$ ,  $(0,0,3)$ ,  $(0,0,4)$  and  $(0,0,5)$ , the number of adventures

corresponding to each are 4,8,16,32 respectively. The total number of adventures is  $2+4+8+16+32=62$ .

In the second test case, for points (0,0,2), (0,2,0) and (0,2,2) there are 25 adventures each, while for the rest of the 5 valid points, there are 5 adventures each. So total is 100.