



Problem D. Radar Scanner

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	512 mebibytes

There are *n* rectangle radar scanners on the ground. Their sides are all parallel to the coordinate axes. Each scanner covers some grid squares on the ground. The *i*-th scanner covers all the squares (x, y) satisfying $x_{i,1} \le x \le x_{i,2}$ and $y_{i,1} \le y \le y_{i,2}$.

Today, the radar system is facing a critical low-power problem. You need to choose exactly three scanners such that there exists a square covered by all scanners.

Your task is to count how many tuples (i, j, k) you can choose so that $1 \le i < j < k \le n$ and there exists a square covered by all three scanners i, j, and k.

Input

The first line of the input contains an integer T $(1 \le T \le 10)$, denoting the number of test cases.

Each test case starts with a line containing an integer n ($3 \le n \le 100000$), denoting the number of radar scanners. Each of the next n lines contains four integers, $x_{i,1}$, $y_{i,1}$, $x_{i,2}$, and $y_{i,2}$ ($1 \le x_{i,1} \le x_{i,2} \le 1000$, $1 \le y_{i,1} \le y_{i,2} \le 1000$), describing the *i*-th radar scanner.

Output

For each test case, print a single line containing a single integer: the number of possible tuples.

Example

standard input	standard output
2	0
3	4
3 1 3 1	
1 1 2 3	
2 1 3 2	
5	
1 1 4 5	
2 1 3 2	
2 2 3 3	
4 5 4 5	
1 2 2 4	