## Problem D. Radar Scanner

Input file:
Output file:
Time limit:
Memory limit:
standard input
standard output
2 seconds
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 $x_{i, 1} \leq x \leq x_{i, 2}$ and $y_{i, 1} \leq y \leq y_{i, 2}$.

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 $1 \leq i<j<k \leq n$ and there exists a square covered by all three scanners $i, j$, and $k$.

## Input

The first line of the input contains an integer $T(1 \leq T \leq 10)$, denoting the number of test cases.
Each test case starts with a line containing an integer $n(3 \leq n \leq 100000)$, 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 $y_{i, 2}\left(1 \leq x_{i, 1} \leq x_{i, 2} \leq 1000\right.$, $1 \leq y_{i, 1} \leq y_{i, 2} \leq 1000$ ), 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 |  |  |  |  |

