

Problem K. Matrix Operations

Input file: **standard input**
Output file: **standard output**
Time limit: 15 seconds
Memory limit: 512 megabytes

Given an $n \times n$ matrix where each element $a_{i,j}$ ($1 \leq i, j \leq n$) in the matrix is 0 initailly, you are asked to successively perform n groups of operations on the matrix.

For each group of operations, you are given six parameters x, y, z_1, z_2, z_3 and z_4 and need to do the following operations in order:

1. Find the maximum element among $a_{i,j}$ ($1 \leq i < x, 1 \leq j < y$), denoted by w_1 ;
2. Find the maximum element among $a_{i,j}$ ($1 \leq i < x, y \leq j \leq n$), denoted by w_2 ;
3. Find the maximum element among $a_{i,j}$ ($x \leq i \leq n, 1 \leq j < y$), denoted by w_3 ;
4. Find the maximum element among $a_{i,j}$ ($x \leq i \leq n, y \leq j \leq n$), denoted by w_4 ;
5. Increase each element $a_{i,j}$ ($1 \leq i < x, 1 \leq j < y$) by z_1 ;
6. Increase each element $a_{i,j}$ ($1 \leq i < x, y \leq j \leq n$) by z_2 ;
7. Increase each element $a_{i,j}$ ($x \leq i \leq n, 1 \leq j < y$) by z_3 ;
8. Increase each element $a_{i,j}$ ($x \leq i \leq n, y \leq j \leq n$) by z_4 .

After performing each group of operations, you need to output the values of w_1, w_2, w_3 and w_4 .

Input

The first line contains an integer n ($2 \leq n \leq 10^5$), indicating the number of rows as well as columns in the matrix as well as the number of groups of operations.

Then follow n lines, each of which contains contains six integers x, y ($1 < x, y \leq n$), z_1, z_2, z_3 and z_4 ($1 \leq z_1, z_2, z_3, z_4 \leq 10^9$), indicating the parameters of a group of operations as described above.

Output

For each operation, output a line containing four integers, indicating the values of w_1, w_2, w_3 and w_4 .

Example

standard input	standard output
3	0 0 0 0
3 3 1 2 3 4	1 2 3 4
2 3 1 2 3 4	4 6 6 8
3 2 1 2 3 4	