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 $a_{i,j}$ $(1 \le i, j \le n)$ 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 $a_{i,j}$ $(1 \le i < x, 1 \le j < y)$, denoted by w_1;
2. Find the maximum element among $a_{i,j}$ $(1 \le i < x, y \le j \le n)$, denoted by w_2;
3. Find the maximum element among $a_{i,j}$ $(x \le i \le n, 1 \le j < y)$, denoted by w_3;
4. Find the maximum element among $a_{i,j}$ $(x \le i \le n, y \le j \le n)$, denoted by w_4;
5. Increase each element $a_{i,j}$ $(1 \le i < x, 1 \le j < y)$ by z_1;
6. Increase each element $a_{i,j}$ $(1 \le i < x, y \le j \le n)$ by z_2;
7. Increase each element $a_{i,j}$ $(x \le i \le n, 1 \le j < y)$ by z_3;
8. Increase each element $a_{i,j}$ $(x \le i \le n, y \le j \le n)$ 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 $(2 \le n \le 10^5)$, 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 $(1 < x, y \le n)$, z_1, z_2, z_3 and z_4 $(1 \le z_1, z_2, z_3, z_4 \le 10^9)$, 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 3 3 1 2 3 4 2 3 1 2 3 4 3 2 1 2 3 4	0 0 0 0 1 2 3 4 4 6 6 8