

## Problem D. Data Structure Quiz

Input file: *standard input*  
Output file: *standard output*  
Time limit: 8 seconds  
Memory limit: 512 mebibytes

After learning KD-tree, you came up with the following problem. It should be a great quiz for this data structure.

You are given an  $n \times n$  matrix  $A$ . All elements are zero initially.

First, you need to perform  $m_1$  range addition operations. For each operation, you are given  $x_1, y_1, x_2, y_2, w$  ( $1 \leq x_1 \leq x_2 \leq n, 1 \leq y_1 \leq y_2 \leq n$ ). You need to add  $w$  to all the elements  $A_{i,j}$  where  $x_1 \leq i \leq x_2$  and  $y_1 \leq j \leq y_2$ .

Then you need to perform  $m_2$  range maximum queries. For each operation, you are given  $x_1, y_1, x_2, y_2$  ( $1 \leq x_1 \leq x_2 \leq n, 1 \leq y_1 \leq y_2 \leq n$ ). You need to find the maximum element among the elements  $A_{i,j}$  that satisfy  $x_1 \leq i \leq x_2$  and  $y_1 \leq j \leq y_2$ .

### Input

The first line contains three integers  $n, m_1, m_2$  ( $1 \leq n \leq 5 \cdot 10^4, 1 \leq m_1 \leq 5 \cdot 10^4, 1 \leq m_2 \leq 5 \cdot 10^5$ ).

Each of the following  $m_1$  lines contains five integers  $x_1, y_1, x_2, y_2, w$  ( $1 \leq x_1 \leq x_2 \leq n, 1 \leq y_1 \leq y_2 \leq n, 1 \leq w \leq 10^9$ ).

Each of the following  $m_2$  lines contains four integers  $x_1, y_1, x_2, y_2$  ( $1 \leq x_1 \leq x_2 \leq n, 1 \leq y_1 \leq y_2 \leq n$ ).

### Output

Output  $m_2$  lines, each line containing one integer: the answer to the respective query.

### Example

standard input	standard output
5 5 5	12
1 1 4 5 4	22
4 1 4 1 10	20
1 3 3 3 3	22
1 1 5 5 8	20
2 4 4 5 8	
2 1 2 1	
4 1 5 4	
1 2 3 5	
2 1 5 3	
1 3 5 5	