Problem I. Farm's SAM

A farm requires to be looked after and sprayed with pesticides periodically to produce high-quality products.

The best time possible for spraying with pesticides is either late winter or early spring, since the plants have not yet grown leaves and require less pesticide to be covered, reducing the maintenance costs. Also, the pesticides will more effectively cover all the stems and branches, and since there is no crop growing, the final product will not be contaminated. Spraying the pesticide while the flowers are blooming will interfere with the fertilization process and reduce the crop yield of the farm.

Mahdi has a field gridded into $n \times m$ cells, with each one having the same surface area and one tree in the middle. These trees are different in size, and therefore different amounts of pesticide are needed for each cell. We have calculated this amount for every single cell.

Ali, who is highly experienced in working with pesticides, wants to help Mahdi with spraying his farm with pesticides, and so has given him a t-day schedule. Each day of this schedule contains 4 numbers a, b, c, and d. On that day Mahdi should take the sub-table that contains rows a to b, and columns c to d, and apply the required amount of pesticide to the cells within that table (a single cell might be sprayed with pesticide multiple times, each time without any reduction in the required amount of pesticide).

Your task is to calculate the amount of pesticide that Mahdi would need each day to complete Mahdi's schedule.

Input

The first line of input contains m and n which are the width and the length of the field. $(1 \leq m, n \leq 500)$

The next following m lines contained n space-separated integers that are the amount of pesticide necessary for each cell. The next line contains t, which is the number of days that pesticide should be applied. $(0 \leq t \leq 10^6)$

The next t lines each contain four numbers a, b, c, and d, which define the sub-table that is to be sprayed on day t. $(0 \leq a, b < m,\ 0 \leq c, d < n)$

Output

For each given line of a, b, c, and d, find the sum of entries in the corresponding sub-table.

Examples

test	answer
4 6 11 16 18 20 19 13 15 17 18 20 15 14 14 18 13 15 16 10 15 12 13 13 17 10 1 1 2 2 4	97