Colorful Carpets (carpets)

William was supervising some kids in a big rectangular room (of size $R \times C$ meters), when he suddenly got an unexpected call from Giorgio to discuss urgent duties for the next round of the OIS. Before answering the phone, he gave the kids K rectangular carpets (numbered from 1 to K) of various sizes to play with.

Figure 1: Some carpets of various colors.

When the call ended, William came back to check the situation and found a giant mess of carpets lying on the floor, some even on top of others: what a disaster!

However, he thought that he could turn this awful moment in a catchy Instagram post. He has already taken a picture of the room from above, but he misses the description. Of course, being a precision lover, William wants to enter a boring but accurate description: the exact coordinates of each of the carpets. Help him!

☞ Among the attachments of this task you may find a template file `carpets.*` with a sample incomplete implementation.

Input

The first line contains three integers: R, C and K. The following R lines contain C integers between 0 and K each, describing a 1×1 m^2 area of the room: a 0 indicates that the square is empty, a positive number n indicates that the n-th carpet is the one visible in that area (i.e., when there are multiple carpets it is the one above the others).

Output

You need to write K lines, the i-th describing the position of the i-th carpet. Each carpet should be described by four integers c_1, r_1, c_2, r_2, meaning that its bottom left corner is at coordinates (c_1, r_1) and its top right corner is at coordinates (c_2, r_2).

Constraints

- $1 \leq R, C \leq 2000$.
- $1 \leq K \leq 10\,000$.
- If multiple sizes are possible for a carpet, you must output the one which has the smallest area.
- It is guaranteed that every carpet is at least partially visible.
- Carpets are orthogonal to the side of the room and are placed at integer coordinates.
- Seen from above, the bottom left corner of the room is at coordinates $(0, 0)$ and the top right corner is at coordinates (C, R).

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (15 points) $R, C \leq 1000$ and $K = 1$.

– **Subtask 3** (45 points) $R, C \leq 1000$ and $K \leq 100$.

– **Subtask 4** (25 points) $R, C \leq 1000$.

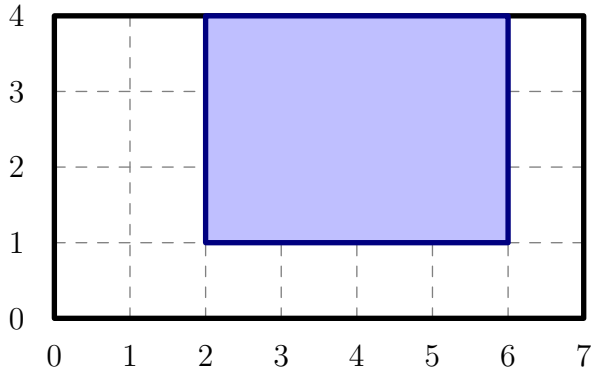
– **Subtask 5** (15 points) No additional limitations.

Examples

input	output
4 7 1 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 1 1 1 1 0 0 0 0 0 0 0 0	2 1 6 4
4 5 2 0 2 2 2 2 0 2 2 2 2 1 1 2 2 2 1 1 0 0 0	0 0 2 2 1 1 5 4
5 6 3 0 0 0 0 0 0 0 3 3 3 3 0 0 3 2 2 3 0 0 0 2 2 0 0 0 0 2 2 1 1	4 0 6 1 2 0 4 3 1 2 5 4

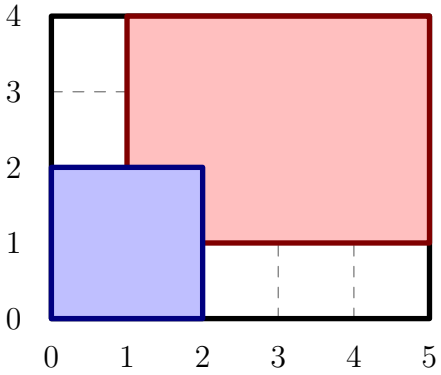
Explanation

The **first sample case** is represented by the following picture.



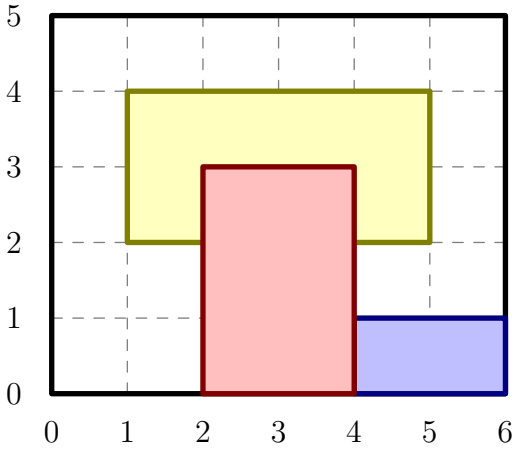
There is only a single carpet (identified with the number 1), which is painted in blue in the picture. Its bottom left corner is at $(2, 1)$ and its top right corner is at $(6, 4)$.

The **second sample case** is represented by the following picture.



There are two carpets: the blue one (number 1) and the red one (number 2). The former is fully visible and is placed between $(0, 0)$ and $(2, 2)$. The latter is partially covered, but we can easily figure out that is placed between $(1, 1)$ and $(5, 4)$.

The **third sample case** is represented by the following picture.



There are three carpets: the blue one (number 1), the red one (number 2) and the yellow one (number 3). The red one is fully visible and is placed between $(2, 0)$ and $(4, 3)$. The yellow one is placed between $(1, 2)$ and $(5, 4)$, with 2 m^2 covered by the red one. We do not know whether the blue one is partially covered or not: as we are requested to consider that it has the smallest possible area, we determine that is placed between $(4, 0)$ and $(6, 1)$.