✅ Calc it Out

The Professor, a genius, is planning a heist on "The Central Bank of Luxembourg".

Due to the death of some previous members of his group, he plans to recruit 2 more members for his group.

Tarikrug and Jar, 2 Asians, have been on his shortlist for a long time due to their excellent calculation skills.

But the Professor wants to test them before finally making them a part of his group.

In the test, the Professor will provide them with a N x M matrix where each cell of the matrix is an integer. The element at the top left corner of the matrix has the location $(0,0)$ and the element at the bottom-right corner has the location $(N-1, M-1)$.

As a part of the test, the Professor will ask them Q queries. Each query will have 4 integers: x1, y1, x2, y2. The answer of such a query will be the product of all elements of the matrix whose location (x,y) satisy the following conditions:

- $x1 <= x <= x2$
- $y1 <= y <= y2$

Since such an answer can be extremely large, you are required to OUTPUT $(ans \% MOD)$ instead where $MOD = 10^9 + 7$

To qualify the Professor's test, they will have to answer all the queries correctly. Tarikrug and Jar have been dreaming of this opportunity since long. They have even thought of their city aliases: Tarikrug (Delhi) and Jar(Kathmandu). Can you help them ?

Constraints:

- $NxM <= 10^6$
- $N >= 1, M >= 1$
- $Q <= 10^6$
- |Each element of the array|$<= 10^8$

Input format:

- The first line contains 2 integers: N and M.
- The next N lines contain M space separated integers.
- The next line contains Q, the number of queries.
- The next Q line contain 4 space separated integers: x1, y1, x2, y2. (You can assume that all queries provided are valid)

Sample Input for test case #1

```
5 5
1234 2221 31123 4123 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
3
0 0 4 4
3 3 4 4
0 0 0 0
```

Sample output for test case #1:

```
585048355
228000
1234
```

Explanation:

The first query asks for product of all the elements in the array which is: 2272966018288985102739720105000096000000 (2272966018288985102739720105000096000000)%(1e9+7) = 585048355

The second query is (19 x 20 x 24 x 25) % (1e9+7)= 228000

The third query is: (1234)%(1e9+7)=1234

❓ Clarifications

<div style="text-align:right">**Request clarification**</div>

No clarifications have been made at this time.

Sidebar:

- ✔ **Points:** 100
- ⏱ **Time limit:** 3.0s
- 📋 **Memory limit:** 64M

∨ Allowed languages
C