Problem L. ICPC

Input file:	`standard input`
Output file:	`standard output`
Time limit:	6 seconds
Memory limit:	1024 megabytes

Fall is taking part in the International Copy & Paste Challenge (ICPC). Suddenly, another contestant behind him stood up and tore his answer sheet into two pieces. Fall is very sad because he would have to spend time and ink to rewrite his answers. Unless... all his answers happen to lie entirely on one of the two halves?

Without time to grieve, Fall immediately begins to compute the probability that all answers lie entirely on one half of the sheet. Formally, the answer sheet can be divided into an $n \times m$ grid of unit squares. There are k segments of Fall's handwriting on the sheet. The i-th handwriting segment can be represented as the rectangle enclosed by (a_i, b_i), (a_i, d_i), (c_i, d_i), (c_i, b_i), where $0 \le a_i < c_i \le n, 0 \le b_i < d_i \le m$.

The contestant tore Fall's answer sheet along a "monotone path", and this path is chosen uniformly at random from all monotone paths. A monotone path is a lattice path from $(0, 0)$ to (n, m) where each step moves either right (by $+1$ in the x direction) or up (by $+1$ in the y direction). For convenience, even if such a path does not split the sheet into two halves (i.e., one half is empty), that path is still considered one of the monotone paths.

Having said that, Fall has computed the probability that all handwriting lies on one half. He wants to verify it, so please compute this probability as well. To prevent that contestant from tearing the sheet again after seeing the probability, report the answer modulo 998 244 353 [†].

[†] Formally, let $M = 998\,244\,353$. It can be shown that the answer can be represented as a reduced fraction $\frac{p}{q}$ where p and q are integers and $q \not\equiv 0 \pmod{M}$. Output the integer equal to $p \cdot q^{-1} \bmod M$. In other words, output an integer x such that $0 \le x < M$ and $x \cdot q \equiv p \pmod{M}$.

Input

There is only one test case in each test file.

The first line contains three integers n, m, k ($1 \le n, m, k \le 2 \times 10^5$), representing the size of the paper and the number of key regions.

Each of the next k lines contains four integers a_i, b_i, c_i, d_i ($0 \le a_i < c_i \le n$, $0 \le b_i < d_i \le m$), describing a key region.

Output

Output a single integer representing the probability that all handwriting lies on one half of the sheet modulo 998 244 353.

Examples

standard input	standard output
4 3 3 0 0 1 1 1 1 3 2 3 2 4 3	199648871
200000 200000 2 114 514 1919 810 233 666 77777 88888	243245654

Note

In the first sample test case, the answer in fraction form is $\frac{14}{35}$.