G - Domino Arrangement

Editorial (/contests/abc435/tasks/abc435_g/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 600 points

Problem Statement

There are N cells numbered from 1 to N. Initially, no cell is painted with any color.

There are M types of colors, and with the i-th color, you can paint any number of cells you like among cells $L_i, L_i + 1, \ldots, R_i$.

Find the number, modulo 998244353, of ways to paint the cells that satisfy the following condition:

- For every cell i, if that cell is painted with a color, then exactly one of cells $i - 1$ and $i + 1$ is painted with the same color as cell i.
  - Here, cells 0 and $N + 1$ are considered to be not painted with any color.

Constraints

- $1 \leq N, M \leq 5 \times 10^5$
- $1 \leq L_i \leq R_i \leq N$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \quad M \\
&L_1 \quad R_1 \\
&\vdots \\
&L_M \quad R_M
\end{aligned}
$$

Output

Output the answer.

Sample Input 1 Copy

Copy

```
5 2
1 3
1 5
```

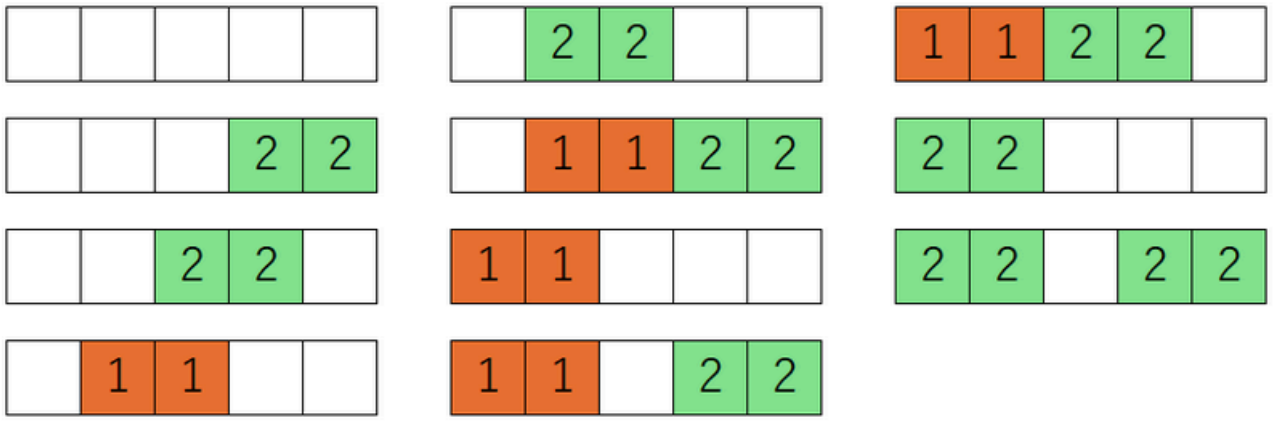
Sample Output 1 Copy

Copy

```
11
```

The first color can paint cells $1, 2, 3$, and the second color can paint cells $1, 2, 3, 4, 5$.

There are 11 ways to paint that satisfy the condition, as follows:



Sample Input 2 Copy

Copy

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```
3 3
1 1
2 2
3 3
```

Sample Output 2 Copy

```
1
```

The one way of not painting any cell satisfies the condition.

Sample Input 3 Copy

```
500000 10
1 499999
2 499998
3 499997
4 499996
5 499995
6 499994
7 499993
8 499992
9 499991
10 499990
```

Sample Output 3 Copy

```
775503999
```

Find the count modulo 998244353.

′#telegram)

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