G - Big Banned Grid

Editorial (/contests/abc413/tasks/abc413_g/editorial)

Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 575 points

Problem Statement

There is an $H \times W$ grid. Let (i, j) denote the cell at the i-th row $(1 \leq i \leq H)$ from the top and j-th column $(1 \leq j \leq W)$ from the left.

Each cell in the grid either has an obstacle placed on it or has nothing placed on it. There are K cells with obstacles: cells $(r_1, c_1), (r_2, c_2), \ldots, (r_K, c_K)$.

Takahashi is initially at cell $(1, 1)$ and wants to reach cell (H, W) by repeatedly moving to an adjacent cell (up, down, left, right) that has nothing placed on it.

More precisely, he can repeat the following operation as many times as he likes:

- Choose one of the following four operations and perform the chosen operation:
  - If $1 < i$ and cell $(i - 1, j)$ has nothing placed on it, move to cell $(i - 1, j)$. Otherwise, do not move.
  - If $1 < j$ and cell $(i, j - 1)$ has nothing placed on it, move to cell $(i, j - 1)$. Otherwise, do not move.
  - If $i < H$ and cell $(i + 1, j)$ has nothing placed on it, move to cell $(i + 1, j)$. Otherwise, do not move.
  - If $j < W$ and cell $(i, j + 1)$ has nothing placed on it, move to cell $(i, j + 1)$. Otherwise, do not move.

Determine whether he can move from cell $(1, 1)$ to cell (H, W).

Constraints

- $1 \leq H \leq 2 \times 10^5$
- $1 \leq W \leq 2 \times 10^5$
- $0 \leq K \leq 2 \times 10^5$
- $1 \leq r_i \leq H\ (1 \leq i \leq K)$
- $1 \leq c_i \leq W\ (1 \leq i \leq K)$
- $(r_i, c_i) \neq (1, 1)\ (1 \leq i \leq K)$
- $(r_i, c_i) \neq (H, W)\ (1 \leq i \leq K)$
- $(r_i, c_i) \neq (r_j, c_j)\ (1 \leq i < j \leq K)$
- All input values are integers.

Input

The input is given from standard input in the following format:

$$
\begin{array}{ll}
H & W \quad K \\
r_1 & c_1 \\
r_2 & c_2 \\
\vdots & \\
r_K & c_K
\end{array}
$$

Output

If Takahashi can move from cell $(1, 1)$ to cell (H, W) by repeating the operation described in the problem, print `Yes`; otherwise, print `No`.

Sample Input 1 Copy

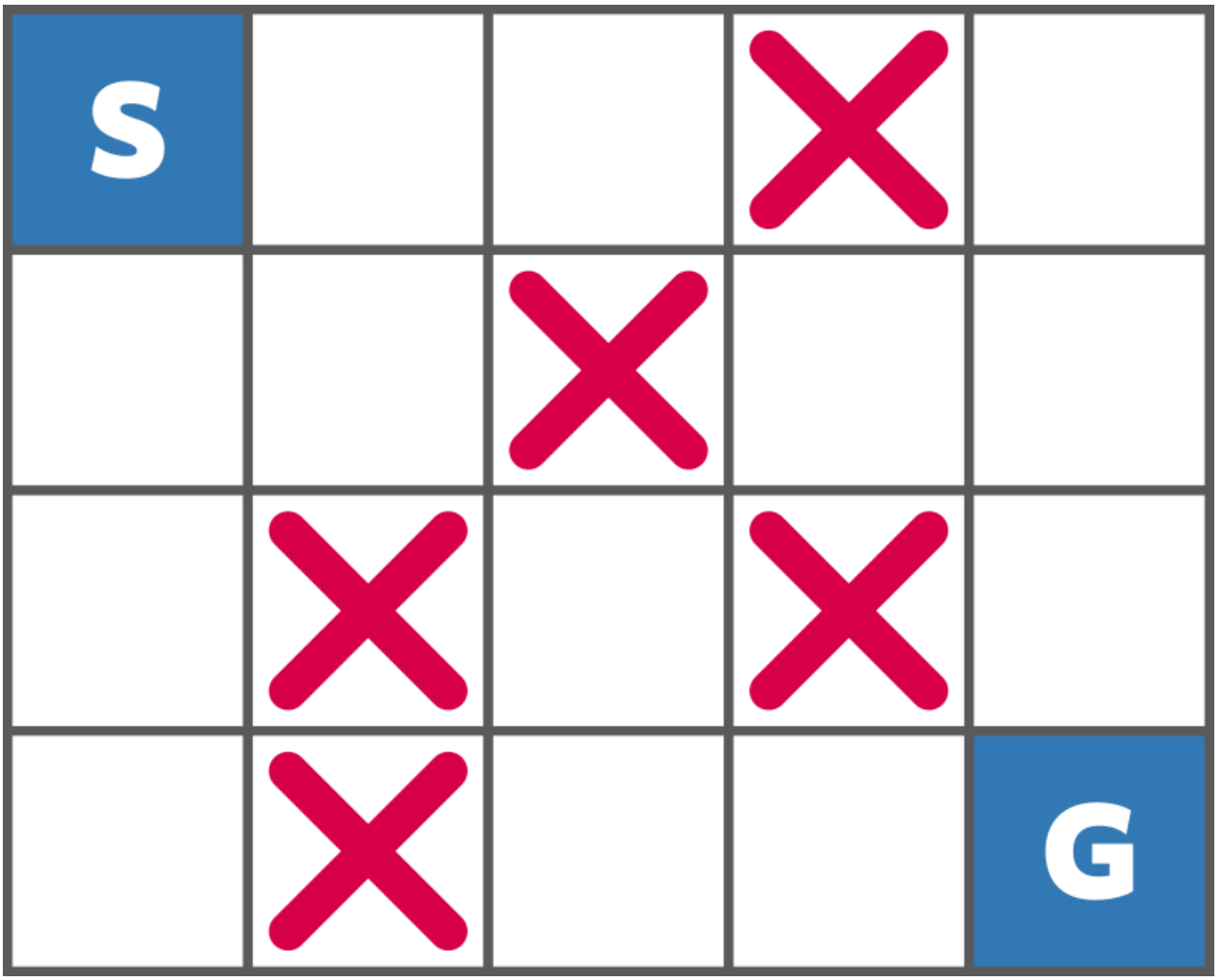
```
4 5 5
1 4
2 3
3 2
3 4
4 2
```

Sample Output 1 Copy

```
No
```

The grid looks as follows:

2026-01-02 (Fri) 05:26:46 +11:00



Takahashi cannot move from cell $(1, 1)$ to cell $(4, 5)$.

Sample Input 2

Copy

```
2 7 3
1 2
2 4
1 6
```

Copy

Sample Output 2

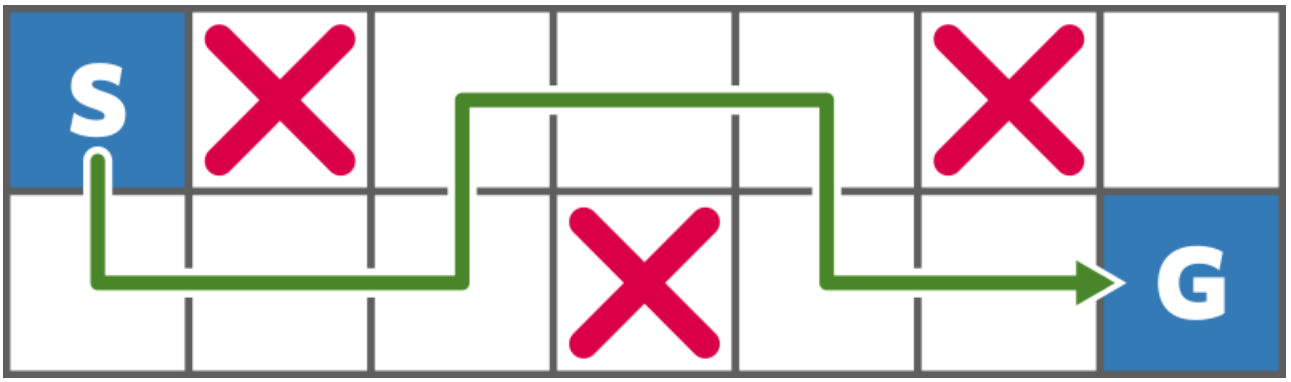
Copy

```
Yes
```

Copy

The grid looks as follows:

2026-01-02 (Fri)
05:26:46 +11:00



He can move from cell $(1, 1)$ to cell $(2, 7)$ by moving as shown in the figure.

Sample Input 3 Copy

```
1 1 0
```

Copy

Sample Output 3 Copy

```
Yes
```

Copy

Note that there may be cases where he does not need to move or where no obstacles are placed.

Sample Input 4 Copy

```
10 12 20
8 3
1 11
6 4
3 7
10 4
5 7
4 7
5 5
4 3
6 1
1 6
2 7
6 7
1 3
6 3
2 12
9 6
7 3
3 11
9 7
```

Copy

Sample Output 4 Copy

```
Yes
```
Copy

'#telegram)

url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc413%2Ftasks%2Fabc413_g%3Flang%3Den&title=G%20-

2026-01-02 (Fri)
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