# Estelle's Concert Spotlights

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|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 2 seconds |
| Memory limit: | 64 megabytes |

Estelle's upcoming live show is going to be held in a large concert hall with thousands of fans attending. The ceiling of the concert hall is fitted with $N$ colourful spotlights. To make the show more visually appealing, Squeaky the Rat, the concert's head visual effects manager, intends to use the spotlights to create colourful lights shows to hype up the audience.

Unfortunately, as the concert hall is located somewhere on a remote island in the middle of the Pacific Ocean, the control panel for the spotlights has malfunctioned due to years of disuse. To ensure that the concert proceeds as planned, Squeaky intends to use his limited mechanical engineering knowledge to fix the control panel.

The circuit board of the control panel can be modelled as a grid of cells with $R$ rows and $C$ columns. The cell with coordinates $(i, j)$ is located on column $i$ and row $j$. The top left cell has coordinates $(0, 0)$ and the bottom right cell has coordinates $(C-1, R-1)$. There are also $N$ connection points located at certain cells of the control panel. The $i$th connection point is located at $(X_i, Y_i)$. Every cell is also located at some height above the base of the control panel. Initially, the heights of all cells are 0 except the cells with connection points. The cell at which the $i$th connection point is located at has an initial height of $H_i$.

To allow the control panel to work, Squeaky needs to determine a *central control point* to connect the power source to the control panel. This *central control point* can be located on any cell, including cells already occupied by connection points.

To connect connection points to the *central control point*, Squeaky must use a solder trail (a trail of 'liquid' metal) to connect them. The solder trail must start from the *central control point*, travelling downward via adjacent cells to the connection point. More precisely, the solder trail can only pass from one cell A to another cell B if the two cells A and B share an edge with each other, and the height of cell A is greater than cell B.

Squeaky may increase the height of any cell and any number of cells by any non-negative amount. Help Squeaky determine the minimum possible height that the *central control point* can be located at, and the coordinates of any possible cell that gives this minimum, to make Estelle's live show a success!

## Input

The input format is as follows:

- The first line of input will contain three positive integers, $R$, $C$, and $N$.
- The next $N$ lines of input will each contain three integers $X_i$, $Y_i$ and $H_i$.

## Output

Output three space-separated integers, $P$, $Q$, and $H$, in a single line. $H$ represents the minimum possible height, and $(P, Q)$ represents the coordinates of the *central control point* to achieve this height.

If there is more than one possible location $(P, Q)$, output any one of them.

## Constraints

All input data satisfy the following constraints:

- $1 \leq N \leq R \times C$
- There will be at most one connection point on a single cell
- $1 \leq H_i \leq 10^9$

## Scoring

| Subtask | Score | $R$ | $C$ | $R \times C$ | $N$ |
|---|---|---|---|---|---|
| 1 | 5 | $1 \leq R \leq 10^9$ | $C = 1$ | $1 \leq R \times C \leq 10^9$ | $1 \leq N \leq 2$ |
| 2 | 8 | $1 \leq R \leq 10^9$ | $1 \leq C \leq 10^9$ | $1 \leq R \times C \leq 10^9$ | $1 \leq N \leq 2$ |
| 3 | 9 | $1 \leq R \leq 10^6$ | $C = 1$ | $1 \leq R \times C \leq 10^6$ | $1 \leq N \leq 10^6$ |
| 4 | 11 | $1 \leq R \leq 10^9$ | $C = 1$ | $1 \leq R \times C \leq 10^9$ | $1 \leq N \leq 10^6$ |
| 5 | 6 | $1 \leq R \leq 100$ | $1 \leq C \leq 100$ | $1 \leq R \times C \leq 100$ | $1 \leq N \leq 100$ |
| 6 | 10 | $1 \leq R \leq 1000$ | $1 \leq C \leq 1000$ | $1 \leq R \times C \leq 1000$ | $1 \leq N \leq 1000$ |
| 7 | 24 | $1 \leq R \leq 10^6$ | $1 \leq C \leq 10^6$ | $1 \leq R \times C \leq 10^6$ | $1 \leq N \leq 10^6$ |
| 8 | 27 | $1 \leq R \leq 10^9$ | $1 \leq C \leq 10^9$ | $1 \leq R \times C \leq 10^{18}$ | $1 \leq N \leq 10^6$ |
| 9 | 0 | Sample Testcases | | | |

## Examples

| standard input | standard output |
|---|---|
| 2 2 4<br>0 0 1<br>0 1 2<br>1 0 3<br>1 1 4 | 1 1 4 |
| 4 4 4<br>0 0 3<br>3 3 4<br>1 1 2<br>0 1 4 | 1 2 7 |