

# Melzar's Maze

## Problem ID: melzarmaze

Being an aspiring young adventurer, you seek to join the ranks of the legendary Champion's Guild. However, the Guildmaster doesn't seem to be all that impressed with your capabilities and achievements. He gives you a challenge, slay Melzar the Mad, a legendary wizard driven to crazed madness who imprisoned himself in his maze-like basement.

You feel discouraged by the task at hand – everyone knows that Melzar's basement is filled with nefarious demons, vengeful spirits, and powerful beasts. You decide to visit travel to meet an Oracle, who, after a small payment of one million gold coins, uses her omniscient powers to grant you a map of Melzar's Maze. She also estimates the strengths of the monsters at each given room, and hands you back an useful annotated map represented by a rectangular  $N \times M$  2D matrix.

You note that the ladder down into Melzar's basement always lands you on the top-left corner room of his basement, and Melzar will always be located at the bottom-right corner room. You figure that you can get a tactical advantage if you find the most optimal path to Melzar. As with any adventurer, you will die if your HP reaches 0. On the map, you notice that some of the rooms are guarded by enemies – you will lose health (negative integers) upon entering these rooms; other rooms are either empty (0's) or contain magic orbs that increase your health (positive integers). To not waste any time, you choose to only ever move to the Right, or Downwards.

Before you attempt to enter Melzar's Maze, you decide it wise to train your HP stat so that you may traverse his maze and finish your quest. But, being lazy, you don't want to over-train. Find the minimum HP that you require to be able to reach and defeat Melzar the Mad. Notes: Any room may contain either an enemy or a powerup (the room where Melzar himself is, or even the room in which you initially enter) then your max HP can go above your HP stat (e.g. if your HP stat is 5, and you heal for 40, you can get up to 45 health)

### Input

You will be given  $1 \leq N, M \leq 5000$ , followed by  $N$  lines, each containing  $M$  integers.

### Output

The minimum HP that you require to be able to reach and defeat Melzar the Mad.

#### Sample Input 1

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3 3
-2 -3 3
-5 -10 1
10 30 -5
```

#### Sample Output 1

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7
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