

# Problem 3548: Equal Sum Grid Partition II

## Problem Information

**Difficulty:** Hard

**Acceptance Rate:** 21.31%

**Paid Only:** No

**Tags:** Array, Hash Table, Matrix, Enumeration, Prefix Sum

## Problem Description

You are given an `m x n` matrix `grid` of positive integers. Your task is to determine if it is possible to make \*\*either one horizontal or one vertical cut\*\* on the grid such that:

- \* Each of the two resulting sections formed by the cut is \*\*non-empty\*\*.
- \* The sum of elements in both sections is \*\*equal\*\* , or can be made equal by discounting \*\*at most\*\* one single cell in total (from either section).
- \* If a cell is discounted, the rest of the section must \*\*remain connected\*\*.

Return `true` if such a partition exists; otherwise, return `false` .

**\*\*Note:\*\*** A section is \*\*connected\*\* if every cell in it can be reached from any other cell by moving up, down, left, or right through other cells in the section.

**\*\*Example 1:\*\***

**\*\*Input:\*\*** grid = [[1,4],[2,3]]

**\*\*Output:\*\*** true

**\*\*Explanation:\*\***



\* A horizontal cut after the first row gives sums `1 + 4 = 5` and `2 + 3 = 5` , which are equal. Thus, the answer is `true` .

**\*\*Example 2:\*\***

**\*\*Input:\*\*** grid = [[1,2],[3,4]]

**\*\*Output:\*\*** true

**\*\*Explanation:\*\***



\* A vertical cut after the first column gives sums `1 + 3 = 4` and `2 + 4 = 6`. \* By discounting 2 from the right section (`6 - 2 = 4`), both sections have equal sums and remain connected. Thus, the answer is `true`.

**\*\*Example 3:\*\***

**\*\*Input:\*\*** grid = [[1,2,4],[2,3,5]]

**\*\*Output:\*\*** false

**\*\*Explanation:\*\***

\*\*\*\*

\* A horizontal cut after the first row gives `1 + 2 + 4 = 7` and `2 + 3 + 5 = 10`. \* By discounting 3 from the bottom section (`10 - 3 = 7`), both sections have equal sums, but they do not remain connected as it splits the bottom section into two parts (`[2]` and `[5]`). Thus, the answer is `false`.

**\*\*Example 4:\*\***

**\*\*Input:\*\*** grid = [[4,1,8],[3,2,6]]

**\*\*Output:\*\*** false

**\*\*Explanation:\*\***

No valid cut exists, so the answer is `false`.

**\*\*Constraints:\*\***

```
* `1 <= m == grid.length <= 105` * `1 <= n == grid[i].length <= 105` * `2 <= m * n <= 105` * `1 <= grid[i][j] <= 105`
```

## Code Snippets

**C++:**

```
class Solution {  
public:  
    bool canPartitionGrid(vector<vector<int>>& grid) {  
  
    }  
};
```

**Java:**

```
class Solution {  
public boolean canPartitionGrid(int[][] grid) {  
  
    }  
}
```

**Python3:**

```
class Solution:  
    def canPartitionGrid(self, grid: List[List[int]]) -> bool:
```