

# 1559. Detect Cycles in 2D Grid

## Description

Given a 2D array of characters `grid` of size `m x n`, you need to find if there exists any cycle consisting of the **same value** in `grid`.

A cycle is a path of **length 4 or more** in the grid that starts and ends at the same cell. From a given cell, you can move to one of the cells adjacent to it - in one of the four directions (up, down, left, or right), if it has the **same value** of the current cell.

Also, you cannot move to the cell that you visited in your last move. For example, the cycle `(1, 1) -> (1, 2) -> (1, 1)` is invalid because from `(1, 2)` we visited `(1, 1)` which was the last visited cell.

Return `true` if any cycle of the same value exists in `grid`, otherwise, return `false`.

### Example 1:

|   |   |   |   |
|---|---|---|---|
| a | a | a | a |
| a | b | b | a |
| a | b | b | a |
| a | a | a | a |

**Input:** `grid = [[\"a\",\"a\",\"a\",\"a\"],[\"a\",\"b\",\"b\",\"a\"],[\"a\",\"b\",\"b\",\"a\"],[\"a\",\"a\",\"a\",\"a\"]]`  
**Output:** `true`  
**Explanation:** There are two valid cycles shown in different colors in the image below:

|   |   |   |   |
|---|---|---|---|
| a | a | a | a |
| a | b | b | a |
| a | b | b | a |
| a | a | a | a |

### Example 2:

|   |   |   |   |
|---|---|---|---|
| c | c | c | a |
| c | d | c | c |
| c | c | e | c |
| f | c | c | c |

**Input:** `grid = [[\"c\",\"c\",\"c\",\"a\"],[\"c\",\"d\",\"c\",\"c\"],[\"c\",\"c\",\"e\",\"c\"],[\"f\",\"c\",\"c\",\"c\"]]`  
**Output:** `true`  
**Explanation:** There is only one valid cycle highlighted in the image below:

|   |   |   |   |
|---|---|---|---|
| c | c | c | a |
| c | d | c | c |
| c | c | e | c |
| f | c | c | c |

### Example 3:

|   |   |   |
|---|---|---|
| a | b | b |
| b | z | b |
| b | b | a |

**Input:** `grid = [[\"a\",\"b\",\"b\"],[\"b\",\"z\",\"b\"],[\"b\",\"b\",\"a\"]]`  
**Output:** `false`

### Constraints:

- `m == grid.length`
- `n == grid[i].length`
- `1 <= m, n <= 500`
- `grid` consists only of lowercase English letters.

