

# 12323 - LAB 06

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## Instructions

1. Access the auto-grader at <https://c200.luddy.indiana.edu>
2. Please write the code for the problems in python language
3. The code should be readable with variables named meaningfully
4. Plagiarism is unacceptable and we have ways to find it, so do not do it
5. Don't change the function signature (name of the function and number and types of arguments) provided in this file.
6. Once you pass all the tests on the auto grader, show your work to the teaching assistant

## Problem

### Question

Imagine you're an astronaut exploring the surface of Mars. During your mission, you come across a network of interconnected caves. While exploring one of these caves, you stumble upon a distress signal indicating that a fellow astronaut is trapped inside.

Your objective is to navigate through the cave system and rescue the stranded astronaut. The cave is represented as a grid, where each cell can either be a passable path or an obstacle. Your starting point is the entrance of the cave, and you need to find the path to reach the astronaut's location which is at the last cell on the bottom right.

Write a function `rescueMission(cave)` that takes a 2D list `cave` as input, where `cave[i][j]` represents the cell at row `i` and column `j`. A value of 1 indicates a passable path, while a value of 0 indicates an obstacle. The function should return a list of directions (e.g., "U" for up, "D" for down, "L" for left, "R" for right) representing the path from the entrance to the astronaut's location. If no path exists, return an empty list. (When you return your paths return them sorted.).

### Test cases

Input: `cave = [[1,1,1],[1,0,1],[1,1,1]]`  
Output: `["DDRR", "RRDD"]`

Input: `cave = [[1]]`  
Output: `[""]`

### Function signature

```
def rescueMission(cave:list[list[int]])->list[str]:  
    return sortedString
```

### Constraints

- 1.) Time complexity should be  $O(3^{n*m})$ . Where `n` is the size of row and `m` is the size of column.