

Prompt	Scratchpad	Our Solution(s)	Video Explanation	Run Code
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Solution 1	Solution 2	Solution 3	Solution 4
<pre>1 # Copyright © 2020 AlgoExpert, LLC. All rights reserved. 2 3 # O(n^4) time O(n^3) space - where n is the height and width of the matrix 4 ▾ def squareOfZeroes(matrix): 5 lastIdx = len(matrix) - 1 6 return hasSquareOfZeroes(matrix, 0, 0, lastIdx, lastIdx, {}) 7 8 9 # r1 is the top row, c1 is the left column 10 # r2 is the bottom row, c2 is the right column 11 ▾ def hasSquareOfZeroes(matrix, r1, c1, r2, c2, cache): 12 ▾ if r1 >= r2 or c1 >= c2: 13 return False 14 15 key = str(r1) + "-" + str(c1) + "-" + str(r2) + "-" + str(c2) 16 ▾ if key in cache: 17 return cache[key] 18 19 ▾ cache[key] = (20 isSquareOfZeroes(matrix, r1, c1, r2, c2) 21 or hasSquareOfZeroes(matrix, r1 + 1, c1 + 1, r2 - 1, c2 - 1, cache) 22 or hasSquareOfZeroes(matrix, r1, c1 + 1, r2 - 1, c2, cache) 23 or hasSquareOfZeroes(matrix, r1 + 1, c1, r2, c2 - 1, cache) 24 or hasSquareOfZeroes(matrix, r1 + 1, c1 + 1, r2, c2, cache) 25 or hasSquareOfZeroes(matrix, r1, c1, r2 - 1, c2 - 1, cache) 26) 27 28 return cache[key] 29 30 31 # r1 is the top row, c1 is the left column 32 # r2 is the bottom row, c2 is the right column 33 ▾ def isSquareOfZeroes(matrix, r1, c1, r2, c2): 34 ▾ for row in range(r1, r2 + 1): 35 ▾ if matrix[row][c1] != 0 or matrix[row][c2] != 0: 36 return False 37 ▾ for col in range(c1, c2 + 1): 38 ▾ if matrix[r1][col] != 0 or matrix[r2][col] != 0: 39 return False 40 return True 41</pre>			

