

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 package main 4 5 import "fmt" 6 7 // O(n^3) time   O(n^3) space - where n is the height and width of the matrix 8 func SquareOfZeroes(matrix [][]int) bool { 9     infoMatrix := preComputeNumOfZeroes(matrix) 10    lastIdx := len(matrix) - 1 11    return hasSquareOfZeroes(infoMatrix, 0, 0, lastIdx, lastIdx, map[string]bool{}) 12 } 13 14 type InfoEntry struct { 15     NumZeroesRight int 16     NumZeroesBelow int 17 } 18 19 // r1 is the top row, c1 is the left column 20 // r2 is the bottom row, c2 is the right column 21 func hasSquareOfZeroes(infoMatrix [][]InfoEntry, r1, c1, r2, c2 int, cache map[string]bool) bool { 22     if r1 &gt;= r2    c1 &gt;= c2 { 23         return false 24     } 25 26     key := fmt.Sprintf("%d-%d-%d-%d", r1, c1, r2, c2) 27     if out, found := cache[key]; found { 28         return out 29     } 30 31     cache[key] = 32         isSquareOfZeroes(infoMatrix, r1, c1, r2, c2)    33         hasSquareOfZeroes(infoMatrix, r1+1, c1+1, r2-1, c2-1, cache)    34         hasSquareOfZeroes(infoMatrix, r1, c1+1, r2-1, c2, cache)    35         hasSquareOfZeroes(infoMatrix, r1+1, c1, r2, c2-1, cache)    36         hasSquareOfZeroes(infoMatrix, r1+1, c1+1, r2, c2, cache)    37         hasSquareOfZeroes(infoMatrix, r1, c1, r2-1, c2-1, cache) 38 39     return cache[key] 40 } 41 42 // r1 is the top row, c1 is the left column 43 // r2 is the bottom row, c2 is the right column 44 func isSquareOfZeroes(infoMatrix [][]InfoEntry, r1, c1, r2, c2 int) bool { 45     squareLength := c2 - c1 + 1 46     hasTopBorder := infoMatrix[r1][c1].NumZeroesRight &gt;= squareLength 47     hasLeftBorder := infoMatrix[r1][c1].NumZeroesBelow &gt;= squareLength 48     hasBottomBorder := infoMatrix[r2][c1].NumZeroesRight &gt;= squareLength 49     hasRightBorder := infoMatrix[r1][c2].NumZeroesBelow &gt;= squareLength 50     return hasTopBorder &amp;&amp; hasLeftBorder &amp;&amp; hasBottomBorder &amp;&amp; hasRightBorder 51 } 52 53 func preComputeNumOfZeroes(matrix [][]int) [][]InfoEntry { 54     infoMatrix := make([][]InfoEntry, len(matrix)) 55     for i, row := range matrix { 56         infoMatrix[i] = make([]InfoEntry, len(row)) 57     } 58 59     n := len(matrix) 60     for row := 0; row &lt; n; row++ { 61         for col := 0; col &lt; n; col++ { 62             numZeroes := 0 63             if matrix[row][col] == 0 { 64                 numZeroes = 1 65             } 66             infoMatrix[row][col] = InfoEntry{ 67                 NumZeroesBelow: numZeroes, 68                 NumZeroesRight: numZeroes, 69             } 70         } 71     } 72 73     lastIdx := len(matrix) - 1 74     for row := n - 1; row &gt;= 0; row-- { 75         for col := n - 1; col &gt;= 0; col-- { 76             if matrix[row][col] == 1 { 77                 continue 78             } 79 80             if row &lt; lastIdx { 81                 infoMatrix[row][col].NumZeroesBelow += infoMatrix[row+1][col].NumZeroesBelow 82             } 83</pre>			

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84   ▾      if col < lastIdx {
85           infoMatrix[row][col].NumZeroesRight += infoMatrix[row][col+1].NumZeroesRight
86       }
87   }
88   }
89   return infoMatrix
90 }
91
```