Leetcode Algo practice

Two excellent online editors for short leetcode practice: Jdoodle.com , replit.com

Practice: https://neetcode.io/practice has over 30 different graph problems that are commonly asked in tech interview

Graphs

Lesson Plan:

1. Graph definitions

vertices
edges
cost
acyclic
directed
marking “visited”

Technical - - marking “visited” usually checking with a set
(you maybe able to not use a set but a simpler approach like marking visited islands with a 2)

Technical - - Acyclic

2. Technical - - Representation of vertices and edges in a 2 dimensional matrix

3. typical Graph solution techniques

use a hashSet to store visited nodes

you have to iterate entire two dimensional graph
Challenge 1 - - knowing how to stop
Challenge 2 - - iterating the vertices without going “out of bounds”

There are two ways to traverse:
BFS , DFS

BFS works good for a square matrix type of solution
BFS uses a queue

DFS is usually used in most other cases
DFS uses a stack

4. advanced techniques

the usual way of testing “out of bounds”

uses a Hash

```
directions = [[0, 1], [0, -1], [1, 0], [-1, 0]]
for dr, dc in directions:
    dfs(r + dr, c + dc)
```

5. Interview process

Study categories as much as individual solutions - there are about 20 categories

Ask clarifying questions

Mention your thought process out-loud - maybe come up with a nive approach first

Know O(time) and O(space)

Exercises:

953. Verifying an Alien Dictionary
Easy

Topics

Companies
In an alien language, surprisingly, they also use English lowercase letters, but possibly in a different `order`. The `order` of the alphabet is some permutation of lowercase letters.

Given a sequence of `words` written in the alien language, and the `order` of the alphabet, return `true` if and only if the given `words` are sorted lexicographically in this alien language.

Example 1:

```
Input: words = ["hello","leetcode"], order =
"hlabcdefgijkmnopqrstuvwxyz"
Output: true
Explanation: As 'h' comes before 'l' in this language,
```

then the sequence is sorted.
Example 2:

Input: words = ["word","world","row"], order = "worldabcefghijkmnpqstuvxyz"
Output: false
Explanation: As 'd' comes after 'l' in this language, then words[0] > words[1], hence the sequence is unsorted.
Example 3:

Input: words = ["apple","app"], order = "abcdefghijklmnopqrstuvwxyz"
Output: false
Explanation: The first three characters "app" match, and the second string is shorter (in size.) According to lexicographical rules "apple" > "app", because 'l' > 'ø', where 'ø' is defined as the blank character which is less than any other character (More info).

200. Number of Islands

Given an `m x n` 2D binary grid `grid` which represents a map of `'1'`s (land) and `'0'`s (water), return *the number of islands*.

An **island** is surrounded by water and is formed by connecting adjacent lands horizontally or vertically. You may assume all four edges of the grid are all surrounded by water.

Example 1:

```
Input: grid = [
  ["1","1","1","1","0"],
  ["1","1","0","1","0"],
  ["1","1","0","0","0"],
  ["0","0","0","0","0"]
```

```
]
Output: 1
Example 2:

Input: grid = [
  ["1","1","0","0","0"],
  ["1","1","0","0","0"],
  ["0","0","1","0","0"],
  ["0","0","0","1","1"]
]
Output: 3
```