CSC 236 A09: Data Structures in Job Interviews

**Interview Question Bank**

What follows is a small set of slightly modified interview questions that is culled from interview questions attributed to large IT companies like Adobe, Amazon, Google, and Microsoft.

One of the seven big ideas in computer science is that “Computing is a creative human activity that engenders innovation and promotes exploration.” Hence, in most cases there is NOT one right answer. These types of interview questions invite you to consider a range of innovative solutions.

1. How would you design a cell phone’s contact list that gives you the contacts that have their first or last names that contain certain letters you type in? For example, if you press “M” it will tell you all the contacts starting with “M”. If you then press “MI”, it will tell you all the contacts starting from “MI” and so forth....
2. Given a string such as ‘I am a human being’, design an algorithm that would output a string that reverses all the letters in the words, but not the input string itself. The output should be “I ma a namuh gnieb”.
3. Given a binary array containing only 0s and 1s, design an algorithm that finds the largest subsequence that contains an equal number of 0s and 1s.
4. You are given a dictionary with a set of words in it, and you are to group all the words that are anagrams of each other into sets.

For example:

Input: “bat”, “tar”, “art”, “xyz”, “design”, “art”, “singed”

Output: ["bat", ["tar", rat", “art”],”xyz”, [“design”, “singed”]]

1. Given a list that can contain duplicate values, output the first unique element in it.

For example:

Input: BH BH Q AL HJ AL HJ PK

Output: Q

Input: BH BH Q AL HJ AL HJ PK Q

Output: PK (OOPS)

1. On an office floor, there are *e* entities, such as Cubicles, Walls, and Coffee Rooms. Design a data structure to store this information so that when a new member joins the company, an empty cubicle that is closest to any coffee room is assigned to the employee. A person can walk through cubicles to go to the coffee room but not through walls.
2. How might you find duplicates in an array or list where there is more than one duplicate?
3. Given a website with static HTML pages and a list of words to censor, you are to design a program that marks all the pages that have a censored word. What is the data structure that is the most appropriate to solve this problem, and what is the best O-notation you can come up with?

This document is to be downloaded as *yourusername-A09-questions.docx* for your reference.