Coding Problems

Arrays and Strings

Problem: Consider a string that can contain ASCII and Unicode characters ranging between 0-65,535. Write a snippet of code that returns true if this string contains unique characters. The whitespaces can be ignored.
(**Google, Adobe, Microsoft**)

Problem: Consider a string that can contain only characters from *a-z*. Write a snippet of code that returns trueif this string contains unique characters. The whitespaces can be ignored.
(**Google, Adobe, Microsoft**)

Problem: Consider a string given as a char[], *str*. Write a snippet of code that replaces all whitespaces with a sequence, *%20*. The resulting string should be returned as a char[].

Problem: Consider two given strings, *q* and *p*. Write a snippet of code that determines whether we can obtain two identical strings by performing a single edit in *q* or *p*. More precisely, we can insert, remove, or replace a single character in *q* or in *p*, and *q* will become equal to *p*.
(**Google, Microsoft**)

Problem: Consider a given string containing only letters *a-z* and whitespaces. This string contains a lot of consecutive repeated characters. Write a snippet of code that shrinks this string by counting the consecutive repeated characters and creating another string that appends each character and the number of consecutive occurrences. The whitespaces should be copied in the resulting string as they are (don't shrink the whitespaces). If the resulting string is not shorter than the given string, then return the given string.

Problem: Consider a given string containing whitespaces and a-z and 0-9 characters. Write a snippet of code that extracts integers from this string. You can assume that any sequence of consecutive digits forms a valid integer.

Problem: Consider a given string containing any kind of characters, including Unicode characters, that are represented in Java as surrogate pairs. Write a snippet of code that extracts the code points of the surrogate pairs in a list.

Problem: Consider two given strings, str1 and str2. Write a single line of code that tell us whether str2 is a rotation of str1.
(Amazon, Google, Adobe, Microsoft)

Problem: Consider a given *n* x *n* matrix of integers, *M*. Write a snippet of code that rotates this matrix by 90 degrees in a counterclockwise direction without using any extra space.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider a given *n* x *m* matrix of integers, *M*. If *M*(*i, j*) is equal to 0, then the entire row, *i*, and column, *j*, should contain only zeros. Write a snippet of code that accomplishes this task without using any extra space.
(**Google, Adobe**)

Problem: Write an implementation of three stacks using a single array. The implementation should expose three methods: push(), pop(), and printStacks().
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(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider an array of integers (positive and negative), *m*. Write a snippet of code that finds all the pairs of integers whose sum is equal to a given number, *k*.
(Amazon, Adobe, Flipkart)

Problem: Imagine that you have k sorted arrays of different lengths. Write an application that merges these arrays into O(nk log n), where n is the length of the longest array.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider two sorted arrays, q and p (they can have different lengths). Write an application that computes the median value of these two arrays in logarithmic runtime.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider that you've been given a matrix, m x n, containing only 0 and 1 (binary matrix). Write a snippet of code that returns the maximum size of the square sub-matrix so that it contains only elements of 1.
(Amazon, Microsoft, Flipkart)

Problem: Consider that you've been given *n* positive integers, *p*1, *p*2, ..., *p*n, where each integer represents a point at coordinate (*I, p*i) . Next, *n* vertical lines are drawn so that the two endpoints of line *I* are at (*I, p*i) and (*I*, 0). Write a snippet of code that finds two lines that, together with the X-axis, form a container that contains the most water.
(Google, Amazon, Microsoft)

Problem: Consider that you've been given a circularly sorted array of integers with no duplicates, m. Write a program that searches for the given x in O(log n) complexity time.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider that you've been given an array of intervals of the [start, end] type. Write a snippet of code that merges all the intervals that are overlapping.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider that you've been given n petrol bunks along a circular route. Every petrol bunk contains two pieces of data: the amount of fuel (fuel[]) and the distance from that current petrol bunk to the next petrol bunk (dist[]). Next, you have a truck with an unlimited gas tank. Write a snippet of code that calculates the first point from where the truck should start in order to complete a full tour. You begin the journey with an empty tank at one of the petrol bunks. With 1 liter of petrol, the truck can go 1 unit of distance.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider that you've been given a set of bars that are different heights (non-negative integers). The width of a bar is equal to 1. Write a snippet of code that computes the amount of water that can be trapped within the bars.
(Amazon, Google, Adobe, Microsoft, Flipkart)

Problem: Consider that you've been given an array of positive integers representing the price of a stock on each day. So, the ith element of the array represents the price of the stock on day i. As a general rule, you may not perform multiple transactions (a buy-sell sequence is known as a transaction) at the same time and you must sell the stock before you buy again. Write a snippet of code that returns the maximum profit in one of the following scenarios (usually, the interviewer will give you one of the following scenarios):
You are allowed to buy and sell the stock only once.
You are allowed to buy and sell the stock only twice.
You are allowed to buy and sell the stock unlimited times.
You are allowed to buy and sell the stock only k times (k is given).
(Amazon, Microsoft)

Problem: Consider that you've been given an array of integers. Write a snippet of code that finds the longest sequence of integers. Notice that a sequence contains only consecutive distinct elements. The order of the elements in the given array is not important.
(Amazon, Adobe, Microsoft)

Problem: Consider a game where a player can score 3, 5, or 10 points in a single move. Moreover, consider that you've been given a total score, n. Write a snippet of code that returns the number of ways to reach this score.
(Amazon, Google, Microsoft)

Problem: Consider that you've been given an array of integers, arr. Write several solutions that return true if this array contains duplicates.
(Amazon, Google, Adobe)