QUestions by position

Contents

Fresher questions

(Less than 1 year experience)

Problem Solving

Coding

- Given a year & day of the year, return the month & the day of the month
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- Write a method which takes in a large string as input & returns all the sets of anagrams in the string
- Write a function to reverse the order of the words in a sentence. Eg. for "Mary had a little lamb" outpu should be "lamb little a had Mary"

- Write a function to level order traversal of a Binary tree. Change this to do spiral order traversal.
- Write a function to figure out if a given Binary tree is a Binary Search tree or not.
- Write a function that prints the path from the root to the deepest leaf in a Binary tree, with the root being printed first.
- Find all the pairs in an array whose sum is k.
- Write code for substr (checking if 1 string is a substring of another)
- Write code for counting # of words in a file/string
- Write code for sorting an array of 0s & 1s
- Implement atoi
- Write a program to remove the duplicates from a list of integers .

Data structures

- You are given 2 arrays of integers. How will you find all integers that are present in both the arrays. Will your solution be different if 1 array is much larger than the other?
- Given a point P (x,y) and an array of a million other points. Find the 100 closest points to P.
- Return the kth element from the end of a singly linked list
- Find the middle element of a singly linked list
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SDE questions

(1-3 years experience)

Problem Solving

- Given a 2D matrix of characters, search for a given string (char array) in any direction (normal, reverse, upwards, downwards or diagonally)
- Array Rotation. You are given an array with n elements { x1, x2 ... xk ... xn }. You are also given an array location k. Using constant space and O(n) time, rotate the array such that it contains {xk, xk+1 ... xn, x1, x2 ... xk-1 }
- Given an NxN array traverse it spirally
- Find a number k in a 2-D array (matrix) in which all the rows and columns are sorted in ascending order
- *Given an array of size n, replace each element in the array with the nearest element to its right which is more than this element.*

Coding

- Convert a Binary Search tree to a sorted doubly-linked-list in-place (with pointer modifications only)

- Write a function to print all the permutations of a String (containing distinct characters).
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Data structures

- Given a circularly shifted sorted array, write a code to search element in it (Eg: array = (7, 8 ,9, 1, 2, 3, 5, 6); search for element 9)
- You suspect that a linked list has a loop (ie. the list is shaped like the figure '6'). Write a linear time algorithm to detect this condition. Altering the list is forbidden and memory is scarce. (follow up: Will the solution work if one ptr is moved with thrice the speed of the other?)

SSE questions

(3+ years experience)

Problem Solving

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- Find a snippet (like what Google shows) with min length from given text. A snippet is defined as a contiguous sequence of characters in the given text such that it contains all the unique words from the text.
- In a given array of positive and negative numbers, find the maximum sub-array sum.
- Given a array of size n, find a minimum element in each sliding window of size k.
- Give a mathematically provable way to create a perfect square from a very long rope. You do not have any measuring device. You can use any number of hooks or people to fix positions on the rope.

Coding

- Given a string and a array of smaller strings. Design a method to find out every occurrence of smaller implementation in larger string.
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Data structures

- Implement the cellphone addressbook: support lookups by name & number
- Implement T9 dictionary mode. Can ask the candidate to code the creation of trie from dictionary

- You have a dictionary file. Now given a random string, show all anagrams of this string which are dictionary words.

TL questions

Problem Solving

- Design a spell-checker that takes in a large string of text as input & returns possible spelling suggestions for all possible spelling errors. You are given a file which has all valid words in a text file.
- You have two dice. One has numbers written from 1 to 6, the other has all sides as blank. What numbers will you write on the other dice, such that the probability of getting sum as 1,2,3...... 12 is equal.
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Coding

Data structures

- Write a cache class, such that it can be used as an application library. Cache is limited by # of entries i can store. Take the replacement policy as an input from the users of your class. Implement LRU policy as a default.
- Design a game: which transform a word to a target word. for example: from head to tail, each step, you just can replace one character, and the word must be valid.
- Implement firefox URL suggest based on Title, URL

Databases

- Create tables for a company HR & project management systems. Entities: Person, Project, Skills(Php, C++, etc). Write SQL queries to find out all projects that need a PHP resource. Create a hiring requirement report from these tables.

Design

- Design Google Reader. Focus on Data Model. Get an idea of scale of the tables.
- Design Twitter. Focus on Data Model. Scale. Push vs Pull model
- Design Yahoo mail
- Create book recommendations for users : go to details of at least 1 solution like collaborative filtering [P-20,D-20]
- How would you implement Chat in a browser? (such as meebo and gmail chat)