String

1. Find min distance between two character in a string ex. a x c a e r r a d e min dis between a and e is 1
2. Write a program to find a string in a page of text.
3. Rearrange a string such that duplicate characters are at least k positions away.
4. write a function that takes in an int and returns a string that would be how one would say that number (ex: 123 -&gt; one hundred twenty three; 50019 -&gt; five thousand nineteen).
5. Given a set of points (x,y) and an integer "n", return n number of points which are close to the origin
6. Given a triangle of integers, find the path of the largest sum without skipping.
7. You are given two version numbers of a software, like Version 10.3.4 and Version 10.3.41. Write a program to find out which of the version numbers are the latest. If version 1 is latest output -1, if version number 2 is latest output +1 else output 0 if same version. Both the version numbers are taken as string. He also asks to make the program of minimum time complexity as
8. write a function that, given a particular filename ending, returns a list of all files with this extension with a language of choice.
9. given a rand5() function which provide a random number between 1-5 at equal probability. Write a rand7() fuction to provide a random number between 1-7 with equal probability...
10. Implement atoi function with all exception handling and same behavior as C++ inbuilt atoi.
11. How would you identify phone numbers from a file containing employee data.

[Input is a string of Bytes E.g.341B   
Convert it to human readable form: 3 characters long (excluding decimal)   
No trailing or leading zeros   
E.g:   
Input 341B   
Output 341B   
Input 12345B   
Output 12.3K   
Input 1234567B   
Output 1.23M   
Input 1000000000B   
Output 1G   
  
Do not round off   
Assume input will not be more than 1G   
For this problem 1000B = 1K, so on and so forth](http://www.careercup.com/question?id=5651177001713664)

Given a log file which consists of timestamp, customer ID, page id visited by that particular customer. Write a function to return all customers who have visited 5 unique pages in last 30 mins

Array

1. Given thousand lists, find the longest common sublis
2. How to keep track of max and min numbers from a continuous stream of numbers
3. In an array you have all the numbers from 1 through n (not in order) with one number missing. Find that number. Now, you have two numbers missing. Find both the numbers. Notes: O(n) time solution, O(1) extra space. n may be very large, so beware of overflows!
4. Log file contains UserId.Every day has new log file.Given range of n days find top 10 users?
5. Converting two D char array to a int
6. Rotate a 2D array 90 degrees
7. Given a set of pairs e.g (5,4) (6,2) (9,3) (2,5) (4,9) .write a function to find the K biggest elements in the array, and return the sum in linear time
8. .Number (like 157, you can find a number 144 + 1 + 5 + 7 = 153), then 144 is a number of 153. find all of possible number in given a N.
9. Find the maximum length of consecutive ones in a nxm matrix which has only 0's and 1's.
10. You have a list of numbers from 1-1000, each number only exists once and they are in random order. You randomly take one out. How do you know which is the missing number?
11. Find the maximum sum subset for a given array .
12. Given a N\*N array where N is even such as 4, 8 and so on . Print the array from the center. a= [1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16] the output should be [6 10 12 7 3 2 1 5 9 13 14 15 16 12 8 4 ]
13. Find 4 numbers in an integer array and they sum zero
14. .Find all the subsets of an array
15. Find top k largest numbers in array in O(n) time
16. Given an array of integers find the element for which the sum of left = sum of right. example -1 100 1 98 1 should return index of 1 i.e 2 Answer: First told him about Brute Force approach and then told him if we can iterate once and get the total sum
17. Given a list of integers as input (ex. {1, 4, 5, 2, 6, 7, 1, 4, 2}), return the biggest sequence of ascending numbers (ex {2, 6, 7}).
18. You are given a 2D Array that contains only 0s and 1s in sorted order. i.e. First Os and then 1s.

Array:

0 0 0 1

1 1 1 1

0 0 1 1

0 1 1 1

You have to figure out the row that contains maximum number of 1s.

e.g. in above case we have row 2 as the answer.

http://www.careercup.com/question?id=5652423706148864

Linked list

1. sort a linked list which has mangled pointers
2. For any positive integer n, define d(n) to be n plus the sum of the digits of n. For example, d(75) = 75 + 7 + 5 = 87. The number n is called a generator of d(n). Some numbers have more than one generator: for example, 101 has two generators, 91 and 100. A number with no generators is a self-number. There are thirteen self-numbers less than 100: 1, 3, 5, 7, 9, 20, 31, 42, 53, 64, 75, 86, and 97. Write a function that returns the number of positive self-numbers less than a number, threshold.

Stack, Queue:

Smallest element in a Queue in O(1) time   using priority queue we can implment

Tree

1. Find the longest path that exists between any two nodes inside a binary tree given only the root of that binary tree.
2. how would you find the element of the tree at a particular "index", where index is defined as the position in the tree's ordering.
3. Given a tree and a number N, construct another tree such that each node of the tree has either 0 or N elements,except for one node which has between 0 to N elements.Only other constraint is that ancestry is preserved in the new tree.
4. Given a BS tree, give the median number in the tree with O(1) space.
5. mplement an n-ary tree

[Write a program to calculate height of a binary tree non - recursively. USE ONLY STACK , not using BFS.   
Then he asked to implement it for n-ary tree.](http://www.careercup.com/question?id=5073763695591424)

Sorting:

http://www.careercup.com/question?id=5183920823861248

Bit Manipul;ation:

1. Given a list of numbers, return a list of all possible permutations. eg. given {1,2,3}, return {{},{1},{2},{3},{1,2},...,{1,2,3}} Had to use bit manipulation where I fumbled.
2. How do you check if the 5th bit is a 1 in a binary number

https://github.com/KartikTalwar/Algorithms/issues/3

Graph

1. Compute number and print all possible paths from (0,0) to (7,7) in a chess board. you can either move down or right
2. Graph coding question regarding showing all the possible movies that contain the same themes.
3. Social Graph : In this problem, we want to parse a members social graup on the hot new social network. For the unfamiliar, each member in the network has n-many friends. Each of those friends has n-many more friends an on and on and on. We would like to write a program that given a socal graph, outputs each level of friends. Each friend should only be output once, at the first level they are encountered. The root friend should not be output. Input will consists of serveral lines, where each line represents a member and their friends. The final line will be the student of whom we will begin our traversal. For instance, a member and their friends will be represented as a string: A:B,C,D Where A is the member and B, C and D are the friends of A. If a member is listed without a colon, you can assume they have no friends of their own. Input 4 A:B,C,D B:A,D,E C:E,B A output: B:C,D E
4. word ladder I. (I used BFS)
5. implement a trie tree

puzzles:

1. 5th Interview Director tech Asked two puzzles 1.3 bulbs and switch board outside room.Find which switch belongs to which bulb in one pass 2.10 Bags with 100 gold coins each. Each coin weighs 10 gms in 9 bags and each coin weighs 9 gms in one bag find out which bag has coins of 9 gms in one weight? '
2. : I have 25 horses and I want to find the fastest amongst them. The contraint is that I do not have any time measuring device. I am given a circular racecourse wherein a max of 5 horses can run in parallel at a given instance of time. How will you find the fastest one.

Given a sorted circularly linked list of Nodes that store integers and a new Node, insert the new Node into the correct position. (Duplicates allowed)

Given an array of strings, return an array of arrays of strings which are grouped by strings that are anagrams of one another.

2D matrices

- K nearest neighbors

Tree mirror

2 questions: First was an easy 1D array problem required to be solved in linear time.  
Second was a Medium difficulty 2D array matrix requiring graph search

2 coding rounds straight from Leet code( medium and hard problems) 1 system design and 1 object design round. Also, every round consists of 15-20 minutes behavioral rounds.

Debugging questions will be of 7 questions for 21 minutes. Ex: An array will be sorted in descending you need to change the code to sort it in ascending.  [5 Answers](https://www.glassdoor.com/Interview/Debugging-questions-will-be-of-7-questions-for-21-minutes-Ex-An-array-will-be-sorted-in-descending-you-need-to-change-the-QTN_1769702.htm)

* Coding Challenge 1) Find the longest palindromic substring from the given string. No need of DP solution.  [7 Answers](https://www.glassdoor.com/Interview/Coding-Challenge-1-Find-the-longest-palindromic-substring-from-the-given-string-No-need-of-DP-solution-QTN_1769703.htm)
* Coding Challenge 2) You will be given N number of points as an array (CPPoint class). CPPoint class will have x and y coordinate. Find the closest k number of points from the origin.  [7 Answers](https://www.glassdoor.com/Interview/Coding-Challenge-2-You-will-be-given-N-number-of-points-as-an-array-CPPoint-class-CPPoint-class-will-have-x-and-y-coord-QTN_1769704.htm)
* Coding Challenge 3) You are given a linkedlist with next and arbitary pointers. Create a new linkedlist similar to the given linkedlist. You need to create a code for deep copy of a linkedlist.
* How would you serialize/deserialize a binary tree?

Given a 2d array of 1's and 0's, where 0's represent water, and 1's represent land, find the size of the largest island.

The first onsite interview did not go well (data structures / algorithms + behavioral questions). They brought a laptop for me to use, but they spent 15 minutes of the 60-minute block trying to get the internet connection to work. We ended up using the whiteboard. After being given the problem, the interviewer immediately asked what my algorithm was. I replied that I needed to think about it, to which he retorted that he needed to know my algorithm. I drew out some quick sample inputs on the board that I could work through. The interviewer did not like how I drew them and insisted I redraw them to his liking. I came up with an approach and then proceeded to write code. While I was writing the code on the whiteboard, the interviewer interrupted me to let me know that I "need to write code or this won't go well for you." I replied that I'm writing code. Eventually, we ran out of time. At this point, he stated that there were "so many problems" with my code. Throughout this whole interview, he was letting out angry/frustrated sighs and interrupting me to reiterate things (like, "I need to know your algorithm" or "you need to write code" while I'm writing code). Maybe he was the "bar raiser" and this was all intentional, but I don't think it was. This guy was rude and mean. I later looked him up on and assuming I found the right guy, there was a chance I could report to him. Had that been the case and I was offered a job, I would not have accepted it.  
  
The second interview was object-oriented design. This interviewer was much nicer. She also asked some behavioral questions.  
  
Next up was the systems design interview. If you read the recommended book, it was exactly like they describe (they even used a question from it). This interviewer also asked a couple of behavioral questions.  
  
The fourth interview was another object-oriented design question and behavioral questions.  
  
Lastly, they had someone take me out to lunch. We just went to the onsite cafeteria. They say this isn't an interview, but don't believe it. I think this was an interview trying to gauge your motivation for wanting to work at Amazon and see if you'd be a good fit from a personality perspective.  
  
After a few days, I was contacted by the lead recruiter and told they needed more data points and wanted to do an additional phone screen. This was then setup for the following week. This was exactly like the first phone screen (coding problem and a few behavioral questions).  
  
Ultimately, I didn't get the job. It is their policy not to provide feedback and was told I could reapply in 9-12 months.  
  
My advice would be to first read the recommended book. This will give you a good idea on how to approach the interviews in general. Multiple questions from my interview were in this book.  
  
As far as the coding for the data structures and algorithms, go to Leet Code and work those. At least one of my problems was in there. You need to be able to solve Leet Code's algorithms problems (of difficulty medium) in an hour window. In retrospect, I should have spent more time on this aspect.  
  
Lastly, the recruiters will tell you to have 5-6 examples that show their leadership principals. The problem here is that over the course of 6 interviews, each asking at least two behavioral questions, you'll quickly run out of examples. Reusing the same examples is not good. Also, over the course of two months, it was hard for me to remember what examples I used.

Then a onsite interview with 4 one on one interviews related to system design, data structures, code refactoring and debugging. Your background experience related questions showing application of leadership principles

Interview Questions

* What do you find most interesting to work on
* Round 1: Leadership principles and Design question  
  Round 2: Leadership principles. Manager round. Complete behavioral  
  Round 3: Lunch. Friendly chat and questions around the company  
  Round 4: Leadership principles and Design question  
  Round 5: Leadership principles, Coding question and some design (guess this was bar raiser)  
  Round 6: Leadership principles and Coding question
* All the interviewers were very friendly except one. I believe that was the bar raiser.

I had really enjoyed the whole process. I completed an online assessment which consisted of 2 questions and 90 mins. After passing that, I was invited onsite. The onsite had 6 1hr interviews. 2 Design, 2 Coding, 1 Behavioral and 1 Lunch. Except lunch, every interview started with couple of behavioral questions followed by either design or coding questions.  
  
Round 1: Leadership principles and Design question  
Round 2: Leadership principles. Manager round.… Show More

Interview Questions

* Group anagrams  [1 Answer](https://www.glassdoor.com/Interview/Group-anagrams-QTN_2194905.htm)
* Given a matrix of integers, start from any column of the first row. can only move diagonally left, diagonally right and down. find the max sum possible. This is a DP problem.

st round with SDE - She asked me simple design question (create a API to fetch Student details). Also, She asked a question based on kadane's algorithm (had to code that on whiteboard).Then few STAR based question (testing on Amazon principle).  
  
2nd round with Hr for 30 mins. He just asked my previous experience and behavioral question.  
  
3rd Round with Sr. SDE. He only asked me behavioral question for 45 mins. He wanted to know everything in details regarding the STAR question.  
  
4th round with another Sr. SDE - Since he came in a bit late, he didn't me any STAR question. Just one coding question related a various famous game (direct from Leetcode). He made sure that I cover all edge cases as well. Also, he helped throughout the interview. I must say he was very helpful.  
 5th Round - lunch with Software Development Manager. No technical discussion. He tried to know me better. We discussed about his past experience and mine as well. We also discussed about the various sports.  
  
6th Round with two SDMs - Only one of them asked me questions. Few Star question and then one DP related question ( a very unique question, haven't seems that one before in CTCI or Leetcode ). Tried My best to provide a solution which was accepted by them. Also, ended up coding on white board. I think this was the bar raiser round for me.  
  
7th round with Sr. TPM. She asked me STAR based question and then a design question ( Amazon internal feature ). Gave her the solution and she liked it. We spoke more about the scalability of feature

3)Print valid QWERTY keyboard suggestions.  
4)Write an algorithm for bitmap application.  
5)Serialize and Deserialize an N-ary Tree.

Find the max number in an array between start and end. The function would like:  
  
findMaxbetween(start, end, array):  
  
   return maxNumber

, Permutations , Design Reservations, Design Recommendations, combination sum

What was a time you had to deal with a customer when you felt the customer wasn't correct?

Write a function that rotates a 2-dimensional array clockwise or counter clockwise 90 degrees depending on a given parameter, which I believe was either -1 or 1, which told you which way to rotate it. You are given the 2D array as a parameter as well.

* Given a sorted array of integers in increasing order (can contain duplicates), return the last index of a specified target integer, or return -1 otherwise. Thus 1, 2, 2, 3, 4 and the target is 2, the function should return 2.  [3 Answers](https://www.glassdoor.com/Interview/Given-a-sorted-array-of-integers-in-increasing-order-can-contain-duplicates-return-the-last-index-of-a-specified-target-QTN_1981699.htm)
* The final question was given a binary tree, find the max height of the tree. I

Find the first bad version, follow up with can you determine if the version code is similar.

Given an array input of N number of strings. [ cat, tac, pot, top, meow, act ]  
Return the output : [[act,cat,act], [pot,top], [meow]]

* Given a stream of letters (like a DNA sequence), scan the stream for occurrences of keywords from a list.  [1 Answer](https://www.glassdoor.com/Interview/Given-a-stream-of-letters-like-a-DNA-sequence-scan-the-stream-for-occurrences-of-keywords-from-a-list-QTN_2069442.htm)
* Given an array of 1s and 0s, cound the "islands" composed of contiguous 1s in the "sea" of 0s.  [Answer Question](https://www.glassdoor.com/Interview/Given-an-array-of-1s-and-0s-cound-the-islands-composed-of-contiguous-1s-in-the-sea-of-0s-QTN_2069443.htm)
* Design an API to add new filters to an extensible version of the unix 'find' command line tool.

Implement an algorithm which can always find the minimum element in a stack

Given a list of weighted edges between nodes, find the minimum cost spanning tre

Given the upper left and lower right coordinates of two rectangles, determine if they overlap

Rotation of matrix by 90 degrees and smallest sum in Binary Tree.

 Find the longest palindromic substring.  
- Return the k-closest points to the center of a cartesian plane given an array of coordinates.  
- Create and return a deep copy of a singly linked list where each node also has an additional pointer to a random node in the list.

Rotate a matrix and reverse the second half linked list.

Design a program equivalent to Microsoft Paint. This contains shapes, print/load/save functionality, etc.

Division without divide operator

How to determine if a graph is a binary tree

List down the paths in a binary tree that sum up to the given sum

finding intersection of 2 lists.

writing a program to tell if a binary tree is a symmetric tree

Given a list of movies and a priority value is given for each movie, the task is to retrieve a given particular movie from the list and predict the similar movies sort by priority. The movie is also categorized under genres for each movi

Longest substring

3. Questions about Amazon Leadership Principles - you can find them online.

Interview Questions

* How to shuffle a deck of card

Merge two binary search trees in O(1) space.