Amazon Interview | Set 54 (For Internship)

October 31, 2013

Hi All. Here is my interview experience for internship at Amazon.
Position: 2-Month Intern
No. of Rounds: 1 Online + 2 PI (2 F2F)

Round 1: (90 minutes)
20 MCQs and 2 coding questions
There were 20 MCQs based on C output, probability, basic maths, OOPS, algorithm analysis and Operating Systems.

Question 1: Given a linked list, write a function to reverse every k nodes (where k is an input to the function).
Example:
Inputs: 1->2->3->4->5->6->7->8->NULL and k = 3
Output: 3->2->1->6->5->4->8->7->NULL.
Inputs: 1->2->3->4->5->6->7->8->NULL and k = 5
Output: 5->4->3->2->1->8->7->6->NULL.

Question 2: Given a string containing words separated by arbitrary number of spaces. Write a function that returns a string consisting of the first letter of each word. (Note: there may be any number of spaces at the starting of the given string, at the end of the given string or in between words of the string.)
Example:
Input: ” this is a test case ”
Output: tiatc
(Function prototypes and main was given for both the questions. Although many solutions passed the initial test cases, they were rejected later as they did not satisfy boundary cases.)

Round 2: (face to face) (1 hour 20 min)
Question 1: Given two numbers represented by two linked lists, write a function that returns sum list. The sum list is linked list representation of addition of two input numbers.
Example

```
Input:
 First List: 5->6->3  // represents number 563
 Second List: 8->4->2 //  represents number 842
```

```
Output
 Resultant list: 1->4->0->5  // represents number 1405
```

I reversed the linked lists and simply added the corresponding nodes along with the carry. Then he asked me to solve the question without reversing the list. Then I solved the question iteratively without reversing the lists.
The interviewer then asked me to write a recursive code for the same problem. After that he asked me to modify the code so that the carry at each place is passed by value instead of using pointers(which I had used in my code).

Question 2: iterative and recursive code to reverse a linked list(Take Care of corner cases: when list has no nodes or contains a single node)

Question 3: Write a function to check whether a binary tree is a sub-tree of another binary tree (Check for all corner cases).
I solved it in O(n^2) time complexity. He did not ask me to optimize my code.

Question 4: Which data structure would you use to keep records of stock market?

I asked him to clarify the problem statement.

He then asked me : Suppose you have to maintain the stock values of various companies during various periods and return minimum stock value of a particular company over a given period of time.

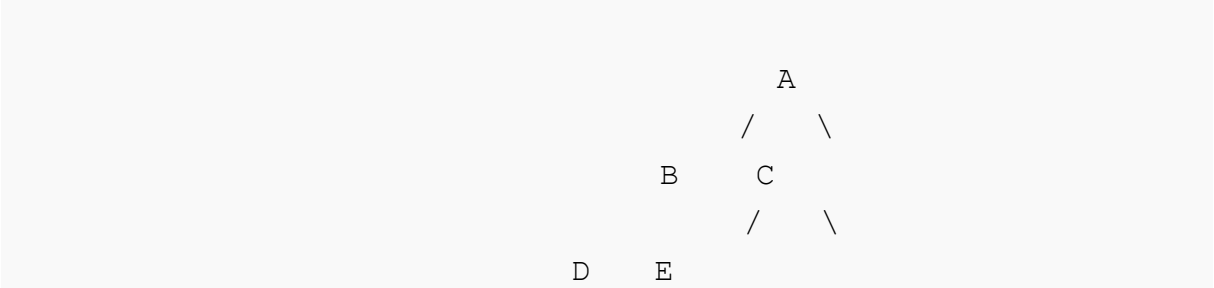
I answered segment tree (Probably the correct answer was queue data structure). However the interviewer proceeded with questions on segment tree.
He asked me to write a code for
a) Creating a segment tree
b) Performing range minimum query in a segment tree
c) Updating the segment tree
He asked me to analyze the time complexity for building the segment tree and performing the range minimum query in the segment tree.
He then asked me: If you are to maintain the stock value of a company for the past 6 months..then you have to update the segment tree every day by deleting a stock value and inserting a new stock value. How would you do that?
Here I got stuck and could not perform the updation in better than O(n) time.(However using queue it can be performed in O(1) time) .

He finally asked me if I had any questions.

Round 3: (face to face) (20 min)
Only one technical question was asked to me in this round.

a) He asked me to speak something about myself and my technical achievements..

b) How to store a binary tree in a file & then read back.(It is not necessarily a BST)
First I answered that I would store level-order traversal of the tree.
He then asked me how I would maintain the nodes at various levels (which I was unable to answer). So, I changed my approach and told that: I would store in-order and pre-order traversals of the tree from which the original tree can be easily retrieved.
But then he told me to optimize my approach (As this approach would require twice the original space to store the data in the nodes). I could not further optimize my approach (However the better approach was to use parenthesization.



If this is the binary tree then it can be stored as (A(B(D),(E)),(C)) in the file.)
c) Then there was a 10 min discussion my project , the problems I encountered and how I solved them.
d) Finally he asked me if I had any questions.
I asked about the intern projects at Amazon and the use of DBMS and NETWORKING in it.
He started elaborating the entire work-process at Amazon and his work-experience……..most of which I could hardly understand. He also told me to have a good knowledge of JAVA as it will be required at some stage during the projects.

Finally I got selected.

Amazon Interview | Set 53 (For SDE-1)

October 30, 2013

In each round they ask me why I want to join amazon, why I am leaving my previous company with such a short span(around 2.5 months) and project stuff.
Interviewers were quite friendly. They would explain you till the point you fully don't understand. And even while discussing approach and solving, they would clear your doubts if any.

Online Test on InterviewStreet

1. Given 2 string , find whether 2nd is sub-string of 1st or not. (it would be great if you solve with KMP)
2. Given 2 rectangles , find whether they are overlapping or not.
3. Given list of coins with various values (unlimited coins of each type) , find how many ways you can make a given value. (DP was expected.) Since it was not guaranteed that coin of value 1 would be present , we have to return -1 if the given value is not possible.

All rounds on same day.

1st f2f:

First I was ask to introduce myself and give a brief over my projects. Latter he ask me to explain any one of my project and the hardest task I have done.
We have used infix to post ix and postfix evaluation for our generic search expression's evaluation. Here we had a lot of discussion on why conversation from infix to post-fix was needed and all.

1. Given a String s and int r , first fill each character row wise and print column wise. for e.g. String s = "abcdefgh" and r = 3
so filling column wise would give :
a d g
b e h
c f

and final ans would be adgbehcf.
he just wanted the exact output. Internally how we handle string was not concern.

2. given a string or say number .. for e.g. 134 now with each number , as per mobile's keypad , some letters would be associated.
here 1 – > abc , 3->ghi, 4 ->jkl . So we should print all the permutation such that we

take 1 character from each of the number.
input number can be of any arbitrary length.
lets say each digit has m numbers associated , then for the input of length n , we need to generate n^m possible strings.

Took a map of which would return all the letters for the number. solved it using recursion. its quite similar to permutation of string. .
Interviewer seemed quite impressed here.

2nd f2f
1. Find integer part of sqrt of given number. Initially I gave o(root(n)) solution. Later solved with binary search(O(logn)).

2. Given an array of integers. replace each number with next higher number on its right side , which is nearer.(if not present than keep it as it is.)
for e.g. input – > 3 4 6 1
output->4 6 6 1

I suggested we can traverse from right side , we will take extra array (o(n) space complexity here) and in that array , we would store index of next higher nearer number.
so it would be like

```
if (a[i] < a[i+1]
  then store i+1;
else
   traverse using index stored in auxiliary array
```

Since we needed extra space to store indexes, he asked that the input is array of a structure which has number and higher Index, 2 fields. So that we don't need extra space and extra traversal.

```
class Node {
   int val;
   int higher;
}
```

He was very interested to see how i keep track of indexes and how i traverse between them. It is o(n) with o(1) space complexity. (when we have a[i]>a[i+1] we

don't do linear search , but we jump using the indexes, so its not o(n^2)) It was hard to convince him on complexity.

3. given a binary tree. connect all the node at the same level. each node would have left,right and nextSibling pointers. we need to fill nextSibling.
solved with level order traversal . Similar to BFS on tree with queue. Only approach was needed, no code for this one.

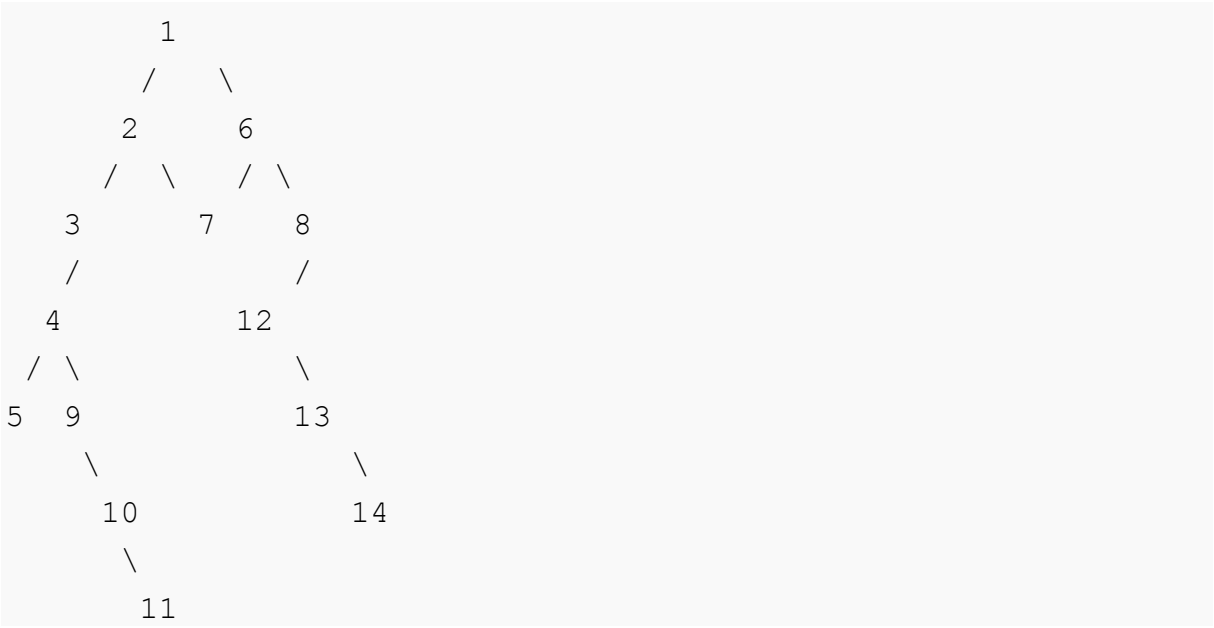
3rd f2f (Hiring Manager)
1. It was a design question. You have to design a game. it has different types of monsters and different weapons. hero would shoot monster. each monster would have some initial health. Each weapon would do some predefined damage to monster. when its health gets 0, monster would die/disappear. and there would be multiple levels. based on level, monster and their behavior would change.

2. Given a read only linked list with next and random pointer , clone the list. I told him that i know the solution and explained him the approach. It was with the use of hashmap and takes o(N) extra space. Then he ask me whether I know a o(1) space solution, since I didn't knew, i was told to solve this. With this , he told that I can modify link list.
Initially I struggled, but with his help, in the end came up with working code. He was looking fine with implementation.

Here I ask about the work culture and the process being followed at amazon.I ask lot of questions regarding tools and technology they use. Since I had work on scrum model , it was quite interesting. He seemed to be impressed here.

4th f2f(Dev Manager)
1. Given 2 sorted linked list , merge them into single sorted list. Change the pointers, don't copy data. (same as merge part of mergesort on SLL)

2. Given binary tree, connect all the nodes which are in same column. 1 caveat was that same 1 node can have 2 parents. Here as in example, node 7 is being pointed by 2 and 6.
Solved it using level order traversal. Used a Map : columNo, Node. it would store the last visited node of that column. So whenever we visit a node, first we check if its corresponding column is present in hashmap. if not , it means its the first node of column, put into map. if the column present , then we will get the node stored in map and current node would be its nextVerticleSibling. and we update the map.
He deed the dry run with example and code and he was OK with final approach.



Finally after two days, I got call from HR that I am selected

Amazon Interview | Set 52 (For Internship)
October 29, 2013

Hi All, Here is my interview experience with Amazon for internship. Hope it helps:

Round 1:
Online round with 20 objective questions on (Questions related to data structures, analysis of algorithms, C Language and some puzzles.) and 2 coding questions in 90 minutes

Write a program to reverse k alternate nodes of a linked list
Ex: 1->2->3->4->5->6->7->8->9
If k is 3 Output should be: 3->2->1->6->5->4->9->8->7

Given a string. Write a program to form a string with first character of all words.
Ex: The bucket is full of water
Output: Tbifow
Check all edge and corner cases.

Round 2: Face to face round
Given a binary tree. Modify it in such a way that after modification you can have a

preorder traversal of it using only right pointers. During modification you can use right as well as left pointers. Write complete code and dry run it for some test cases.

Given 2 linked lists. Find out if they intersect or not. If yes, find intersection point .Write complete code for it.

I could not remember the simple way: find the length of the lists and simply move forward the shorter list by difference of the lengths and find the intersection point. Instead, I joined the end of first list at the end of the 2nd list and then went for cycle finding by Floyd Cycle finding Algorithm. Although both are O (n), but he was impressed as it was a new approach.

Round 3: Face to face round
Given a sorted array of 0's and 1's. Find out the no. of 0's in it. Write recursive, iterative versions of the code and check for all test cases.

Spiral level order traversal without using extra variable for detecting level (using one stack and one queue) and few other implementations as well.

Amazon Interview | Set 51 (On-campus for SDET)

October 3, 2013

Hello Everyone!! Recently, I have been through the interview experience of Amazon India and I would like to share my experience with everyone.

Position : SDET

No. of Interviews : 1 Written + 4 PI (3 F2F and 1 telephonic)

Suggestions : Your code should be optimal, have proper variable naming, consider all corner cases and should not be lengthy.

Round 1: (90 minutes)
20 MCQs and 2 coding questions

Coding questions :
1. A string consists of parenthesis and letters. Write a program to validate all the

parenthesis. Ignore the letters.
eg. ((alf)ls) – valid
)(dkk)() – invalid

2. You are involved in a betting game whose rules are as follows :
a) if you win a round, the bet amount will be added to your sum and next bet amount will be $1;
b) if you lose a round, the bet amount will be reduced from your total sum and next bet will be twice the previous.
c) game ends when all the rounds are complete or you dont have sufficient sum.
Initially, you are given with a string of the form “WLWWL” where W indicates a win and L indicates a loss and initial sum. Initial bet amount will be $1.
You need to find the amount at the end of the game.
Function prototypes and main was given for both questions

Round 2: (face to face) (1 hour 15 min)
1. Given a 2d matrix in which rows are sorted in ascending order and columns are also sorted in ascending order .I need to find an element in optimal time complexity

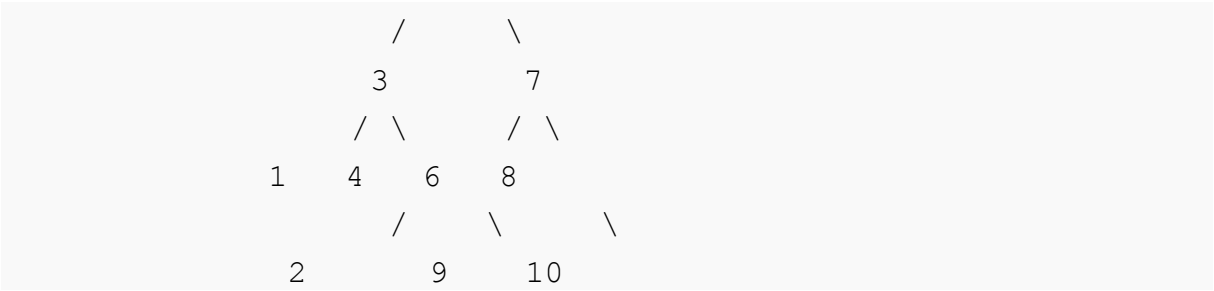
2. In the same (M X N) matrix I have to print the matrix in increasing order of elements .write code for it(I used heap for that purpose and used concept of merging k sorted array).

3. Given an array , each element is one more or one less than its preceding element .find an element in it.(better than O(n) approach)

4. Given two strings STR1 and STR2 .we need to find longest substring in STR1 whose all characters are taken from string STR2(was asked to write code for it in optimal time)

```
STR1-abcdefacbccbagfacbacer
   STR2-abc
   ans : length : 7
            acbccba  (from position 7 to 13)
```

5. Given a binary tree. I need to print the nodes in vertical line zigzag manner. For example: 1st vertical line from top to bottom, 2nd vertical line from bottom to top,3rd vertical line from top to bottom and so on



Answer would be –
1
2 3
5 4 6
9 7
8
10

Round 3: (face to face) (50-60 minutes)
I was asked about my project in details. He asked me project related questions for first 20 minutes.
Next he asked to convert a binary tree in a doubly link list.
I told him various approaches like by using space complexity and in-place conversion.
I was asked to code all those approaches.
Then he gave a hint about one more approach and asked to code it.

Round 4: (face to face) (60-70 minutes)
Again, I was asked about my project in details and he was questioning me on every part of it. Next he asked me to name the subjects that I have studied so far . He asked many theoretical questions on database management systems, SQL, operating systems, OOPs concepts and their real life examples and also two coding questions.
1. Code for dfs of a tree(tree can be any general tree)
2. Print pascal triangle and your output should be same as pascal triangular form (have to consider the space separation) .I told him two approaches and wrote the code.

Round 5: (telephonic) (1 hour 30 min)
For first 40 minutes he asked me about my achievements, about amazon company, my project in details and what problems I faced in project and how I resolved them. next he asked one coding question.

1. Find the square root of any number (square root can be a real number) without using any library function .
I told him an approach using Newton-Raphson method. It was faster but he asked simple and optimal method so then i suggested binary search method (O(log n)) and I was asked to code it and dictate and he ran the code on his system also.

Finally, I was hired with three of my friends.  :

Amazon Interview | Set 50 (On-campus for SDE)

October 2, 2013

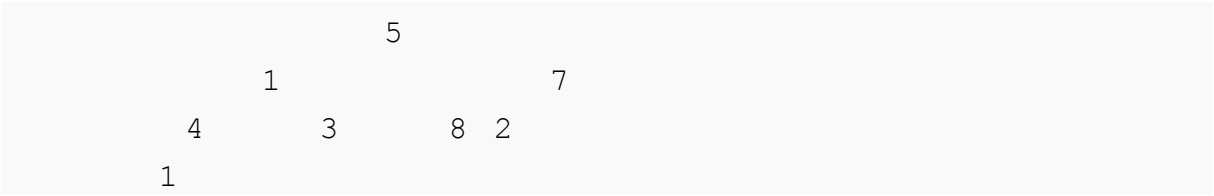
Recently, I have been through the interview experience of Amazon India and I would like to share my experience with everyone.

Number of interviews: 1 online exam (will be completely evaluated by the compiler itself, then code of those who will clear the cut-off will be analysed by the hiring team) + 3 Face to face technical + 1 Telephonic (Technical again)

Online exam:
20 MCQ: Aptitude questions, if you are good in logical reasoning then don't worry about it (basic permutation and combination), C output questions, and most of them were pretty simple.
2 Online coding questions: 1. Print the first non-repeated character in a string.
2. Print the left view of a binary tree.

1st Face to face:
A skeleton of a binary tree with nodes having garbage values is given and an array is given. Had to fill up the binary tree skeleton with the values in array such that the resulting tree is a BST.
Solution: sort the array, enter the values in an in-order fashion (A long discussion on which sorting algorithm is the best and why? We ended up discussing how merge sort can be optimized, just "optimized", not like reducing the order of time or space complexity). Then told me to write the merge-sort function for the discussed solution for merge-sort such that say I am a developer, I can't test on a machine, and this class will be used by a million number of users.

2nd Face to face:
Was asked 4 questions: Print all string permutation (String might have repeated characters).
Least distance between two values in a very big binary tree (Binary tree may contain same value in many nodes).



{Least distance is 3 between 1 and 2 (not 5). }

Vertically print the value in a binary tree. Like in the previous example:
4, 7
1
5, 3, 8
7
2
Next, I was asked to design an efficient data structure for two lifts in a building of n floors.

Round 3 Face to face:
Had to find maximum profit in an array of stocks prices for consecutive days in two cases, one I can sell and buy any number of times I want, second, I can only buy and sell one time.
Another question was to define a function “inorder_it(Node A, Node root)” which will return the next node in a binary tree to a particular node A. Was asked to write code for both of them.

Round 4: telephonic:
Kind of HR + Technical, asked a lot about my internship project and other academic projects. Then we discussed the problem of sorting rows of a file based on a particular column. Like as in Excel file, you can sort file based on roll_no, first name, last name, any column you want.
File is very large, so you can’t just store the whole file into memory.
Solution: sort it out yourselves.

All the best everyone.
And yes, I got through along with 5 other mates from my college.

Amazon Interview | Set 49 (On-campus for SDE-1)

October 1, 2013

Recently, I have been through the interview experience of Amazon India and I would like to share my experience with everyone.

Position: SDE- 1

No. of Interviews: 1 Written + 4 PI (3 F2F and 1 telephonic)

Before telling you the questions and interview procedure, I would like to offer some suggestions. There are always instances when your interview is not off with a great start. You need not panic and keep your calm. Secondly, to compensate all the shortcomings in the technical part, interact with the interviewer as much as you can. Show him that you are really interested in the company. They are looking for future managers not just coders, so you have to have people skills.

Okay, so here we go:

Day 1:

Round 1 : (Written on Interview Street)
20 MCQ questions consisting of Data Structure, Algorithms, Operating Systems, Probability, Combinatorics and Quatitative Analysis.

Suggestion: Always code your solution on the editor provided on the website. It takes screenshots of the page so if you copy a large chunk of data even from your notepad that's considered as cheating.

Coding Problems :
1. A string consists of parentheses and letters. Write a program to validate all the parentheses. Ignore the letters.
eg. ((alf)ls) – valid
)(dkk)() – invalid

2. You are involved in a betting game whose rules are as follows :
a) if you win a round, the bet amount will be added to your sum and next bet amount will be $1;
b) if you lose a round, the bet amount will be reduced from your total sum and next bet will be twice the previous.
c) game ends when all the rounds are complete or you dont have sufficient sum.
Initially, you are given with a string of the form "WLWWL" where W indicates a win and L indicates a loss and initial sum. Initial bet amount will be $1.

Function prototypes and main was given for both questions.

Round 2 : (Face to Face)
The interview started off with a light discussion about myself, achievements. Then he asked me about my project and the difficulties faced. Then we moved on to coding problems.

Q1: You are given an array in which you've to find a contiguous subarray such that the sum of elements in it is equal to zero. (I coded using hashtable in java)
Q2: Given a binary tree. Find out if it is a binary search tree or not.

Round 3: (Face to Face)
Q1: You are given a generic tree. Design a structure for it. Now for every node of the tree make the leftmost child of the node as a duplicate of the node itself and return the root of the tree.
Q2: He: Tell me the time complexity of 8-queen problem.
Me: (I did not exactly remember the complexity so I coded)

Round 4: (Face to Face)
He asked me variety of theory questions, I was stumped as I did not know many things. He asked me about ACID properties, oops concepts, SQL etc. out of which I could answer only a few.
Then we switched over to coding.
Q1: He: You are given various time intervals and you have to merge the overlapping ones.
Me: I had already coded it in the Code Ninja questions on the amazon's website, so he just asked me the approach to the question.
Q2: You are given a binary tree. Tell me if it is height balanced or not.

Round 5: (Telephonic)
The interview started with if I had any questions, and then proceeded with the projects I've done.
Q1: You are given a file with many words. You are given a word as an input and you have to find every anagram of that word in the file.
Q2: Given two words, tell if they are anagrams or not. Extend your solution for unicode as well.

Finally after a long wait of almost 8 hours the result came and I was hired!! 

I would like to thank geeksforgeeks for all the pain they take in compiling every article so that people may understand every concept clearly.

Amazon Interview | Set 48 (On-campus for SDE-1)

September 30, 2013

Recently, I have been through the interview experience of Amazon India and I would like to share my experience with everyone.

Position: SDE- 1

No. of Interviews: 1 Written + 4 PI

Day 1:

Round 1 : (Written)
20 MCQ questions consisting of Data Structure, Algorithms, Operating Systems, Probability, Combinatorics and Quatitative Analysis.

Coding Problems :
1. A string consists of parentheses and letters. Write a program to validate all the parentheses. Ignore the letters.
eg. ((alf)ls) – valid
)(dkk)() – invalid

2. You are involved in a betting game whose rules are as follows :
a) if you win a round, the bet amount will be added to your sum and next bet amount will be $1;
b) if you lose a round, the bet amount will be reduced from your total sum and next bet will be twice the previous.
c) game ends when all the rounds are complete or you dont have sufficient sum.
Initially, you are given with a string of the form “WLWWL” where W indicates a win and L indicates a loss and initial sum. Initial bet amount will be $1.

Function prototypes and main was given for both questions.

Round 2 : (Face to Face)
Some discussion on my projects, and then a couple of questions.
1. An array of integers is given, find all the ranges present in the array.
eg. 1 6 4 2 3 — ranges will be {1-4} and {6}.
I used sorting to solve this problem, so some follow up questions about which sorting technique i would prefer here.
What is the difference between merge sort and quick sort and when quick sort is preferred over merge sort, etc.

2. Two strings are given. One of them is the initial string and other string contains characters as per their priority. Sort the initial string as per the given second string. characters in initial string may or may not be present in the second string. If not present, sort them in lexicographical order at the end of output.
eg. String1 – ddloyc, String2 – odl
Output – oddlcy
Again, some discussion over various approaches to solve this problem.

Round 3 : (Face to Face)
Discussions over my projects.
1. (Reservoir sampling problem) http://www.geeksforgeeks.org/reservoir-sampling/
2. Generate all valid permutations of n pair of parenthesis. http://www.geeksforgeeks.org/print-all-combinations-of-balanced-parentheses/
3. Given a bst, update the value of every node with sum of value of all nodes greater than and equal to the value of current node.
Counter Question : I had used global variable for this purpose, so he asked me to solve it without any global or static variable.
4. Inorder Successor of a node in bst.
5. Given a list and a number k, invert first k elements and leave next k elements. Repeat this throughout the list.

Round 4 : (Face to Face)
1. N number of jars are kept in a linear fashion. Each jar contains a color whose value ranges from 0-99. Now you can mix any two adjacent jars having colors ‘a’ and ‘b’ (both integers), and it will produce a new color of the value (a+b) mod 100 and will also produce smoke with value (a*b). Mix all the jars in a way such that in the end only one jar remains and total smoke produced is minimum.

Day 2 :
Round 4 : (Telephonic with someone very senior)
He said that i must have been through many coding questions already, so he will start with the basics.
1. What is the difference between C and C++ ?
2. Which one will you prefer, when and why?
3. What is the difference between C++ and JAVA.
4. Which is better, C++ or JAVA. Support your answer.
5. Give one use case where C/C++ can use pointers to solve it, but it can’t be done in Java.

6. Again, some discussion over my projects. Which project i liked most and why? What problems did i face during that
project and how i handled them.
7. Given a stream of 0′s and 1′s in which 0′s come first and then 1′s, find the first occurrence of 1.
8. Design a data structure for phone-book of mobile phones. Implement it and discuss about its benefits and limitations.

In the evening they announced the result and i was hired!!! 😃 😃

Suggestions :- Write a neat code with indentations. It’s a good idea to mention all the test cases(in case of an algorithmic problem) and all the use cases(if needed to design a data structure) beforehand. And, don’t just respond to the questions of the interviewer, try to interact with them.

Amazon Interview | Set 47 (Off-campus for SDE-1)

September 20, 2013

Round 1: Written
20 MCQs and 2 coding questions
(1) Mirror a tree.

(2) Find if an array has pair of elements with sum k.

Round 2: Telephonic Interview
(1) Given a number, find the next minimal greater number with same number of set bits(Approach+code)

(2) Given a linked list with next and arbit pointer. Clone the list(Approach + code)

(3) AVL Tree(Approach)

Round 3: Telephonic Interview
(1) Given a number which denotes number of pair of parenthesis(only one type of parenthesis). Print all the valid permutation of those parenthesis(Approach + code).

(2) Connecting all nodes at the same in Binary Tree(Approach + code)

Round 4: F2F(manager)
Discussion on all projects I have done.

(1) Convert BT to DLL(Approach + code)

(2) How to find if nodes in LL are odd or even(Approach)

(3) How to detect loop in LL(Approach)

(4) Segment Tree(Approach + code)

Round 5: F2F(Two interviewers)
This one was bar raiser I guess

(1) Convert a BST in such a way that every node contain sum of it and every greater element than it (Approach + code)

(2) Garbage collector(Approach)

(3) Finding median in array(Approach)

(4) Finding k closest elements to an element in an array(Approach)

(5) Deleting a node from LL provided the tail nodes points to mid element. After deletion property should be maintained(Approach)

Round 6: F2F(Senior guy)
A long discussion on projects.

(1) Circular Buffer array problem(Approach + code)

(2)BT is BST or not(Approach + code)

Round 7: F2F (Two interviewers)

(1) Given coins of 1,2 and 5 and given a number N. Find in how many ways you can make the change(Approach + code)

(2) Swapping alternate nodes in LL(Approach + code)

(3) Swapping k nodes in LL(Approach)

Round 8: F2F(Again with manager)
Discussion on projects. Every positive , negative point he discussed on each projects

Now All HR type questions

(1) How will you handle conflict with teammate.

(2) How will you handle conflict with manager.

(3) Your teammate is not sharing required information with you. What will you do?

(4) If you are given 10 requirements and you don't have to fulfill each and every requirement what will you do?

(5) Given some languages which one you prefer and why?

(6) Given some tasks with one you prefer?

(7) If you are about to meet deadline and one of your teammates need some help.Would you cross deadline to help him?

Amazon Interview | Set 46 (On-campus for Internship)

September 15, 2013

Written:
20 MCQ on basics of C, OS, Networking + 2 Coding.
1) Left view of Binary Tree.
2) Rotate a matrix by 90 degree.

Interview (Round-1)
1. You have to find p,q of matrix p*q such that it fill n elements(n given) Such that
a) matrix should be nearest to a square matrix and
b) 0<=((p*q)-n)<=2

2. Zig-zag traversal of tree

3. You are given an array of length k and it have numbers from 0 to n (where k>>>n) in O(n) time and no extra space find occurrences of each element in O(n) time only

Round-2
1. You are given row and column wise sorted matrix you have to find and delete an element such that it is still sorted in O(n) time.

2. Find if sum of any 2 elements in an array equal to k in O(n) time using extra space.

3. In a BST to every element add sum of elements greater than it.

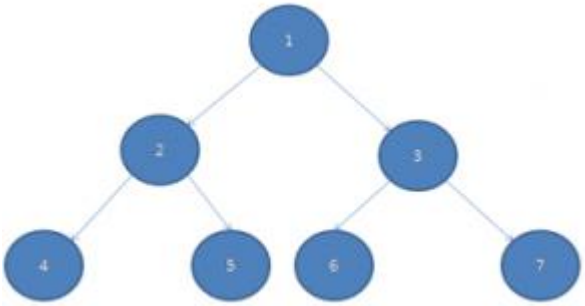
Result –> Got Selected from Campus Internship Interviews.

Amazon Interview | Set 45 (For Internship)

September 14, 2013

Hello everyone! Recently I sat for an on-campus internship recruiting process of Amazon. The process consisted of a written round followed by two face to face interviews.

Written Round:
This round consisted of 20 MCQs and two coding questions. We had to complete the test in 90 minutes. The MCQs mainly focused on C and general aptitude. They were easy to solve. The students having faster question solving skills were in advantage! The two coding questions were:
1. We were given the edges of the graph and we had to find if a cycle exist in the graph or not.
2. Given a binary tree, we had to print all the nodes in the Zigzag order.



For the given tree, we should print: 1324567
A total of 18 students were selected for the next round from around 150+ students.

Face to Face Interview:
The interviewer started with the question about what projects I have done. I explained the two recent projects which I did. Then he started asking technical questions. He asked about:
1. Given a sorted array which has been rotated, we have to find the point of rotation.
I did it in O(n). Then he asked me to write a more optimized code. I then did it in O(log n) using modified binary search.
2. About heaps, maps.
3. About Job Scheduling.
4. Scaling of websites as one of project was an online portal.

Then he asked me if I have any questions. I asked about how to improve. He said that I should blue practice the problems more and more. I should work more on algorithms rather than solving the problems relating to the limitations of any language. He even emphasized on the fact that companies like Amazon are looking for the students having good knowledge of algorithms. He even mentioned that GeeksforGeeks is a perfect site for preparing for companies like Amazon.

I was not lucky enough to be selected in the 2nd round of the interview but it was a motivating experience.

Amazon Interview | Set 44 (For Internship)

September 14, 2013

The written round was relatively easy. It contained 20 multiple choice questions on basic c, algorithms and finite automata. Some questions from OS and networking were there too but were easy. Coding questions were:
1. Find the nodes of the tree as seen from the left view of the binary tree.
2. Rotate the given matrix by 90 degrees i.e. the first row becomes the last column and second row becomes the second last column and so on.

Interview round 1:
Two questions were asked. One puzzle and the other coding question.
1. Given n coins for two players playing a game. Each player picks coins from the given n coins in such a way that he can pick 1 to 5 coins in one turn and the game continues for both the players. The player who picks the last coin looses the game. You have to tell that for given n coins who looses the game?

2. Given a number n, find the number just greater than n using same digits as that of n.

Interview round 2:
1. Given in facebook find an efficient way to find the mutual friends between you and one of your given friends.
Hint: hashing, dictionary data structure implementation

2. For two very long numbers given, find the product of these numbers in an efficient way.
Hint: using binary multiplication effectively.

Finally I got internship offer from them….:)

Amazon Interview | Set 43 (On-Campus)

September 13, 2013

Questions asked in Amazon Interview.

Round 2: Written
1. Find the SQRT of a number.

2. Simulate Reversed level order traversal.

Three F2Fs.
F2F 1:
1. Given a binary tree, no two adjacent nodes have same color, but all leaves should be in same color. You can fill only with two colors. Write a function to find whether a given tree can be colored using above scenario.

2. Given a binary tree, change the right pointer of every leaf node to the next leaf node (right to it but may be on different level).

3. Given a class with n people,where each people plays a game with all other people. Results are with you. You have to arrange them in a queue with a condition that, a[i] should have won a[i-1], for all I, you don't need to care about a[i-2] . (a[i] may win or lose a[i-2]).

F2F 2:
1. Write prime numbers from 1 to 100000.

2. Another simple question from tree. can't remember 

3. Question from probability. Given c containers, r red balls, g green balls. Give a condition that if a guy randomly pick a ball from any of the containers, it should be red.(more probable)

F2F 3:
1. Reverse a linked list iteratively, recursively.(Ice breaking question )

2. Given a matrix with 1s and 0s, u have to construct a matrix such that a[i][j]=1, if only every element in ith row and jth column is 1, otherwise 0. You have to use constant space and O(mn) time complexity.

3. Maze solve problem. Given a matrix with 1s and 0s, 0 represents free path, 1 represents blocked area, and you can move in any of the 8 directions. Find the path from source to destination and print it. Then he told me that he can change destination at run time. And asked me to do for that.

Amazon Interview | Set 42 (On-Campus)

September 10, 2013

Following questions were asked during interview.

1. Given an array, find the longest increasing subsequence of size 3 with max product, all numbers are positive.

2. Given 3 linked lists representing 3 numbers, add them and return the result as another list (take care that your method handles overflows).

3. Find the lenght of longest path in a binary tree(diameter). I gave a O (nlogn) solution. He wanted O (n) solution. did that

4. You are standing at 0 0 and you have to get to i, j. Find the number of ways. Did that with recursion then with DP. Then he extended the question saying some edges are not traversible. Then edges have weights, find min weight path.

5. Delete all leaf nodes in a tree.

6. Find the peak in an array, array is first increasing then decreasing. Peak is the max element.

7. Given a binary tree. A complete path is defined as any path from root to leaf. A k heavy path is a complete path with sum of node values on that path > k node values can be -ve too. Delete all nodes in a tree which do not lie on any k heavy path.

8. Given a rotated sorted array, find the minimum element.

9. Infinite stream of bits is coming, after every bit comes, you have to determine whether the number formed with bits till now is divisible by 3 or not, you cannot form the number as it will overflow at some stage.

10. Imagine a binary tree lying on the floor with nodes as balls and edges as threads, you are given a pointer to a node. When you pick the tree from that node up what will be the structure of the tree. You have gravity changing the structure of the tree.

11. An array is given representing the colors of n jars, colors have values 0-99. When two jars are mixed the resulting volume is same as volume of one jar. Smoke is color1*color2… and resulting color is (color1+color2)% 100. Keep on mixing colors such that you end up with just one jar with minimum smoke.

12. A question on paging, processes also.

Selected … thanks to geeksforgeeks team.

Amazon Interview | Set 41 (On–campus)

September 9, 2013

The first round had 20 multiple choice questions covering C programming, Data structures, Algorithms, Maths and puzzles, and a question from Networking and Operating systems. The duration of the test was of 90 minutes and marking scheme was +1, -0.25

It also had 2 coding questions.
i) Given an array of numbers, find the minimum value of the absolute difference that can be obtained from any pair of numbers from the array.

ii) Find the first non-repeated character in a string. If there are no such chars then return -1.

There were 4 rounds of technical interview, no HR round. Following are the major questions asked to me in the tech rounds. I had to first suggest the logic, discuss that with the interviewer and then he asked me to code it up.

Round 1 –
1) Check if a given tree is a Binary Search Tree or not. Simple enough question.

2) You are given an array whose each element represents the height of the tower. The width of every tower is 1. It starts raining. How much water is collected between the towers?
Eg. [1,5,3,7,2] – then answer is 2 units between towers 5 and 7.
Looks easy, but if you don't observe well, then you might end up with the wrong logic like I did at first. Also there are lots of possible corner cases. Luckily I could identify them all.

3) Given an array and a fixed window size X, you have to find out the minimum value from every window. De-queue was not allowed. So I had to do it using 2 stacks.

Round 2 –
1) Some DBMS questions like how is database stored in memory,how an image stored in database and a few more questions from it.

2) What is a height balanced tree. Give an O(n) solution to balance it. Then he changed the definition of a balanced tree as- a tree is balanced if every node in a particular level should have the same number of descendants (and not only direct children). And every node can have any number of children. I had to design the class and then write the code for it.

3) Given an array of integers, find an index such that if you split the array into two parts the absolute value of the difference between the sum of elements in both parts had to be minimum. After giving him the logic, he changed it to split it into 3 parts such that sum of elements in all of them are equal. I had to code this one.

Round 3 –
1) There is a sentence that your friend knows, but while giving it to you, he lost all the spaces. You have to dictionary with you. How would you reconstruct the original sentence using it.

2) How to delete a particular node from a circular Linked list.

3) You are given an encrypted file. You don't know the key used to encrypt it. Like A might be mapped to B, B to some D and D to some other F. But you don't know this encryption scheme. You have the dictionary with you. How will you decrypt the file? I suggested lots of solution like exhaustive searching, then using some variants to minimize the complexity. He gave me just a one word hint- histogram. So I gave him a logic that counting the frequency of every letter used in the dictionary. Then replace the most used letter in the file with the most used in the dictionary. And then compare words with the dictionary. In case of a mismatch back –track and use the second largest and so on. I also discussed with him that it could also have high complexity in worst case, but he moved on.

4) What is indexing in DBMS. How will you implement an index.

Round 4 -

1) A complete path in a tree is from a root to a leaf. A k-heavy path is a complete path whose sum of elements is greater than k. Write a code to delete all nodes which are not in any of the k-heavy paths.

2) You have an array whose elements firstly strictly increase and then strictly decrease. You have to find the point of change.

All the questions in all the rounds required the minimum possible complexity possible (both time and space). And I had to write the code of my final solution as well. Finally the results came and I was selected by them.

Amazon Interview | Set 40 (On-Campus Round 1)

August 29, 2013

20 Objective type questions (Technical: OS, Java, Networking) and 2 programs. Time given was 90 minutes.

1) Longest Remaining Rime Scheduling

2) Threads

3) subnetmask – classB – 64 departments

4) Match the following
SMTP
BGP
TCP
PPP

5) On recursion, value of f(513,2)

```
if(n<0)
  return 0;
else
  return ( n%10 + f(n/10, 2) )
```

6) Complexity?

```
f(i) = 2*f(i+1) + 3*f(i+2)
For (int i=0; i < n; i++)
   F[i] = 2*f[i+1]
```

7) Frog steps either 1, 2 or 3 steps to go to top. In how many ways it reaches the top?
Based on recursion, options
a) f(i) = f(i+1)+f(i+2)+f(i+3)+1
b) f(i) = f(i-1)+f(i-2)+f(i-3)+1
c) f(i) = f(i+1)+f(i+2)+f(i+3)
d) f(i) = f(i-1)+f(i-2)+f(i-3)

8) Based on java 2 questions, one from Exceptions

9) Preorder is given, we had to find out the postorder

10) Memory management, pa=32bit, la=36bit , frame size=2^12, first page entry, second page entry

11) This question is from GATE CS previous question papers

```
for (int i=0; i < n; i++)
     Fork();
No of child process?
```

Programs:
1) Print left view of binary tree

2) Sum of 3 linked list

```
Digit..   123------1->2->3------------linkedlist1
          234----2->3->4--------------linkedlist2
          34567----3->4->5->6->7---linkedlist3
Output: 34924-------3->4->9->2->4
```

Sum(linkedlist1, linkedlist2, linkedlist3)
We had to print the linkedlist form of the digit.

Amazon Interview | Set 39 (SDE)

August 25, 2013

I recently attended the walk-in process for Amazon Off campus recruitment drive. This was for SDE position at Chennai. I would like to share my interview experience with Geeks for Geeks.

Written Round :
a) Given a linked list and 2 integers M and N.. Keep M nodes and delete N nodes repetitively till the end of linkedlist.

b) Given a BST , replace a node value with the sum of all the elements larger than the current node.
I could solve it with Reverse Inorder traversal and an int pointer to keep track of the sum.

c) Given a BST and a value , check if the path sum from root to leaf equals the given value.

1st F2F round:
a) Multiply two linked lists represented by numbers. Only one linked list must be used to do all additions and store the result i.e., intermediate additions should not be done with extra linked lists and finally computing the result.

b) Given a BT check if there is a BST in it. If it exists print the largest BST in the BT.

c)Given a large file with huge number of words group the anagrams of a word
hai how are you. iahohw done woh.
o/p:
hai ->iah
how ->woh ->ohw
done
are

2nd F2F round:
a) Given a linked list , print the nth last node. He asked me to give the optimised solution for it.
solved using slow pointer.

b) Find the LCA in Binary Tree
He asked me to optimise the code with bottom up approach and gave lots of boundary conditions

c) Given a zigzag traversal construct a tree from it. Full working code was asked.

```
eg. 1 3 2 4 5 6 7 9 8
                1
              2   3
            4   5  6   7
          8  9
```

Solved it with double ended queue.

3rd F2F round :

a) Given a chess board of finite length , start postion of a knight , an end position.
->find whether the end position is reachable by the knight.
-> Number of minimum hops required to reach that position.
I came up with a BFS solution instantly . He posed several conditions in the same question as I have seen the question already.

b) He changed the question to infinite length chess board and if given two knights in a chess board .find minimum hops required for them meet.
->gave a lot of space and time constraints.
->asked me to write the complete code without STL.

c) if we encode A-1 , B-2 , C-3 , I send a word CAMP encoded as 311316. It can be decoded as 3 11 3 16 (CKCP), 3 1 1 3 16(CAACP) , 3 1 1 3 1 6 , (CAACAF) . given a input encoded string find the no. ways it can be decoded. (ACODE prob. in Spoj)
311316 – 4
->Could n't come up with DP solution at first so gave a solution with recursion tree. He asked me to optimise to avoid unnecessary computations.. Finally Solved it using DP.

4th F2F round (Bar Raiser Round):

The Round started with the projects I have done so far. Few basic questions in cloud computing. I have used Amazon Web Service (AWS) in one of my projects.
a) Lots of questions on AWS . Why we used it when there are so many alternatives.
b) When i convinced him with scalability issues, he posed questions on how AWS handle load Balancing and scalability issues .
c) Obviously questions on Elastic Map Reduce and Elastic Block Storage. Questions piled up until I could explain every nook and corner in that project.
d) Strengths and Weakness.
e) Why Amazon and why do I leave my previous company within 2 months.

f) Given a linked list with random pointers , clone the linked list.
Gave few solutions and he asked me to clone without manipulating the original linked list but with extra space. Came up with little tweaks using HashMap
Map< node * , node *> key is the node and value is the random ptr node.

g) Find the ceil and floor of a value in a given BST without extra space.
if a BST contains 1 3 6 7 9 12
->if the given value is 8 floor is 7 and ceil is 9.
->if the given value is 9 both floor and ceil is 9.

P.S. Be cautious in explaining your projects.

5th F2F round: (Hiring Manager Round):

Few questions on projects and advantages of AWS.
a) Asked me about the different inter process communication methods.
b) Which method is faster and why. Then he asked me to explain about shared memory

c) Asked to write the code to implement LRU cache.
d) Then code for malloc implementation given an array.

e) He asked me to write a thread safe code for the given scenario.
given two writer threads and two reader threads . give a mechanism to handle the writer and reader threads. The writer thread writes a value 1 2 3 4 in a queue or array and reader thread reads it and print the output as 1 , 2 ,3 ,4 …..In the same order as given and only once…
->i handled it with a binary semaphore and a single queue for both reader and writer..
f) conditions for a deadlock and he asked me to associate with the real life scenario.
mutual exclusion and all the cases.
g) Different types of scheduling and what type of scheduler does linux have and why.
h) doeslinux have preemptive scheduling and few questions on virtual memory.
He just analysed my approach towards the problem and checked my basic understanding in OS concepts.

Finally got offer from Amazon after two days. I owe a great thanks to GeeksForGeeks. It helped me a lot to improve my data structure and problem solving skills. Hope this will help you. All the Best .

Amazon Interview | Set 38 (SDE-I)

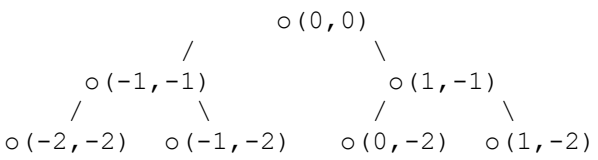
August 16, 2013

1) (Telephonic round 1)
a. Print a matrix in spiral order (Code)
Soln: Solved it using recursion. Each recursive call was suppose to print boundary elements. On every recursive call, shifted the origin point and passed new size of matrix.
b. Given a pair of brace {}. Validate it. (Code)
Soln: using two variables (i.e open_count and close_count) and proceed further.
c. What if we have multiple types of braces? (Approach)
Soln: Using stack.

2) (Telephonic round 2)
a. Given list of songs. How would you shuffle it? (Code)
Soln: Gave various approaches from naive to optimal. The optimal one was similar to shuffling of array of ints.
b. Give list of words. Print all anagrams together. (Code)
Soln: Used Hashmap with key as "sort(str[i])" and value as List which is anagrams.

3) 3: In-house 1
There are various varieties of clothes (say shirt). Varieties are based on parameters like pattern, size, colour, etc.
a. What will be your input format so that it can store all values of all parameters?
List<List<String>>. Each List<String> denotes values for a particular parameter
b. Design a class for a shirt for the same requirement.
c. You have to return all different types of shirts that can be formed based on various combinations of input parameters. (Code)
d. Assuming you have all types of shirts available. Now there are various queries like:
i. Show all types of shirt having colour "red",
ii. Show all types of shirt having size "small" and pattern "check" etc. etc.
So how will you store I/P so that this requirement can be fulfilled efficiently?

4) In-house 2
a. Given a Binary Tree. Assuming each node denotes some x,y coordinate. root node denotes (0,0). Write a code to display coordinate of all nodes.
case (i): Tree is complete and no node's x-coordinate is overlapping. (i.e all nodes will expand along x-axis so that no node overlaps). (Code)



Here we can see that many nodes are overlapping over x-cordinate.

case (ii): Tree is incomplete and no node's x-coordinate is overlapping. (Approach)
case (iii): Tree is incomplete and node's x-coordinate can overlap. (Approach)

b. Design a DS to perform
Insert
Search
Delete
get Random
All in O(1).
Soln: Focus on Delete and get_Random. On further analysis, only get_Random was required to me modified. Only a bit of tweak will serve the purpose.

5) In-house 3
a. Given array of ints. Assuming total no. of elements is even. Need to tell whether this array can be grouped in sets of pairs such that sum of each pair is divisible by K.
eg: 0,2,4,8,12,20,18,4 and k=4
so (0,8), (2,18), (4,20), (4,12) is one such set in which sum of each pair is divisible by k.
(Code)

b. There is a vertical rod. Discs of various radiuses are inserted in it. When we will try to take out any disc then 1st all the discs above it has to be taken out. Taking out a disc and putting it back is counted as one step.
Considering this, what will be the minimum no of steps in which these discs of various radius can be stored in sorted order in the rod.
Only minimum no of steps was required. "How to sort" was not required. (Approach)

c. Given array of ints. find ar[i],ar[j] such that j>i and ar[j]-ar[i] is maximum. Famous problem. (Code)

6) (Semi Technical- Hiring Manager)
a. Normal HR questions. Why Amazon over your previous company, some areas where you want to improve, define dream job and similar other questions as per the discussions.
As per feedback: my answer for "Why Amazon over prev company" was not clear here.

b. Given two arrays of ints of size m and m+n in sorted order. merge it inplace. Famous problem. (Code)

c. Given string.
Qusn: Find the char occuring max no of times.
Soln: Simple one. Take auxillary array of size 256 and maintain frequency of each char. Scan auxillary array and get the required char. O(k+n) where k=256 here.
Counter Qusn: Why O(k+n)? Why can't it be O(n) only?
Soln: At the time of maintaining freq of each, compare to get max freq char also. No need to travel aux array again. O(n)
Counter Qusn: What if memory size is only 100 bytes?
Soln: Detailed one.
Counter Qusn: Assuming updating freq of each char takes 1sec, so it will take N secs roughly. How can we improve it?
Soln: Use multi threading for parallel programming.
Counter qusn: Will there be any issue?
Soln: In case one aquires lock, other one that needs lock will go in waiting. This adds extra time and so can take more than N secs.
Counter Qusn: How to improve this?

Soln: Detailed one.
And many more such counter questions.

7) (Amazon Seattle. Semi HR. Analysis of thought process- BAR RAISER)
a. Again same question. Why Amazon over previous company?
This time I was prepared
b. One +ve point and one -ve point from amazon india site.
c. Was prepared for this and already did some pre analysis on the site.
Many more such HR questions.
d. Analysis of thought process:
Assuming a new building is going to be constructed for IT official purpose. 75 floors. You are builder. This building will be on lease for diff companies.
i. How many lifts you will add in that building?
ii. At which floor each lift will stop?
Note: At each step, I had to identify the required data after analysis and then only data for the same was provided.
Soln (i): (As it is totally based on thought process, so counter question from your side is good point)
1. No of Lifts are determined by many factors. Major factors are height of lift and no of persons working in that building.
2. I was knowing height of building. To calculate no of persons, I asked size of each floor. It was 100 sq m each floor.
3. Each floor will have cubicles and other rooms and passages. Assuming 70% of total area is used by cubicles.
4. Each cubicle will have 4 persons. After calculation it came to be 40 employees per floor. So 3000 employee in whole building.
5. Next analysis was: In most of the IT company, the in/out timing is flexible. Generally in time is b/w 9:00-11:00 and out is b/w 5:00-7:00.
6. We have 2hrs of window in which all employee will use the lift. So no of lifts will depend on this factor also.
7. After calculation, it came out to be approx 9 lifts (which was a good no according to him).
Soln (ii): Now the qusn is at which floor each lift will stop.
8. AS we don't know how many companies will be there in this building at any time, so it is advisable to provide equal chance for employees on the basis of floor no. rather than on the basis of company.
9. Best way would be to minimise the no. of stops of each lift.
10. This can be done by giving each lift equal no of floors on which it will stop.
11. It can simply be calculated as 75/9= 9 (round off).
12. So 1st lift will have floor buttons b/w 1-9, 2nd will have b/w 10-18 and so on.
13. This approach was best (according to him) for current scenario.
14. Remember that each floor should get equal chance and we don't know how many companies will be there.

Tips: Geeksforgeeks, Careercup, Cracking the code Interview (Book) +++++.

Finally got offer in few days. Very satisfied.

Amazon Interview | Set 37

August 5, 2013

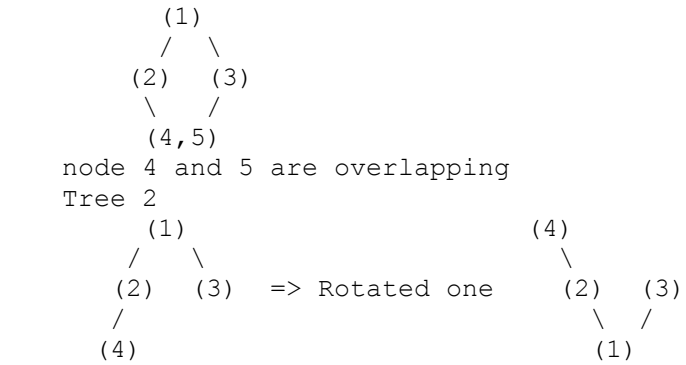
Interview Experience for placements at AMAZON.
It consists of 1 online round (20 MCQ + 2 coding question) and 4 F2F interviews.

Online Round 1:
20 MCQ 1 question each from OS, pigeon hole principle, probability, DBMS, networks, NP problem and other questions from C/C++ input output and logical question

22 from batch out of 300 students were selected for F2F interviews

Interview Round 1:
As they were short in time as it was 9 at night so they asked me single coding question.
Que 1: Given an array of n numbers with repetition of numbers. You need to find the max length of continuous sub array with at max 3 unique elements.
For eg
array: 1 2 3 1 4 3 4 1 2
ans: 6 (3 1 4 3 4 1)
Solution: Time complexity O(n)
Extra Space O(1)

Interview Round 2:
They asked me 3 questions but I am not remembering the 2nd one. Sorry for that
Que 1: You are given two binary trees. You need to tell that if one tree is rotated 90 degree and placed at bottom of that tree and each leaf nodes at max depth of two trees will meet each other or not.
for eg:
lets assume () as a node
Tree 1



So it returns true as node 4, 5 of tree 1 is overlapping with node 4 of tree 2
Firstly I was asked to give algorithm then when i gave he asked me to code it
Solution: Time Complexity O(n+m) (where n and m are nodes in tree 1 and tree 2 respectively). Space Complexity O(n+m)

Que 3:
Suppose u given normal deck of cards 4 suites and 13 cards of each suite in which one card is missing
you are picking a card one at a time and sees that card and putting it aside
Find the suite and number of missing card.
Then he said change the number of suites to K (very very large you cant add till k)
and N numbers (again very large numbers)

Interview Round 3:
It was an easy round for me atleast but not for others
Que 1: Find the palindrome of a given number without using extra space

Que 2: 100 floors and 2 egg problem changed to 50 floors and 2 eggs

Que 3: You are given array of numbers which increasing first then decreasing. Find the greates number.
eg: 1 2 3 4 5 4 3
answer: 5
Solution : Time Complexity O(logn)
Space Complexity O(1)

Interview Round 4:
He asked me about my myself apart from coding and as I said “Hacking” so we discussed about hacking a lot.
He also aksed me about my projects
Then he gave me a puzzle:
Assuming I have a chessboard (8X8)
a knight is placed at (x,y) and he moves N hops
Find the probabilty that he will be inside after N hops.
On a condition that if a knight moves outside then he will remain outside he cant come inside.
For eg. (x,y)=(0,0)
n=2
probabilty=(12/64)

4th round was type of HR as he wants to know about myself and how I do different things.
If I stuck in a position what will I do.
If your boss says that you have to do X and you are not satisfied with this then what will you do and how will you approach.

After that I waited for 3 hours and I got selected with 4 of my friends 

Hope this will help, I try the possible way to support you.

All the best for your placements 

Amazon Interview | Set 36

July 31, 2013

1 round (20 MCQ + 2 coding question)
3 face to face round, 1 telephonic interview.

1st coding question
_____

Find the diameter of the tree.

2nd coding question
_____

check the validity of sudoku.

1st face to face Round
_____-

Qs-1) In a binary tree, a complete path is defined as a path from root to a leaf. The sum of all nodes on that path is defined as the sum of that path. Given a number K, we have to remove (prune the tree) nodes from the tree which lie on a path having sum less than K. A node can be part of multiple paths. So we have to delete it only in case when all paths from it have sum less than K.
I was able to solve the problem with bottom up approach, and able to write a working code of it.

Q-2) Given an array of positive numbers, find the maximum sum of a subsequence with the constraint that no 2 numbers in the sequence should be adjacent in the array. So 3 2 7 10 should return 13 (sum of 3 and 10) or 3 2 5 10 7 should return 15 (sum of 3, 5 and 7).
I was able to give him a DP solution with a Parent array which stores thee index of the parent of every element,i hd put -1 for the first element,at the end I backtrack the array to find the all the elements.

2nd face to face Round
_____-

After some personal questions, the interviewer asked 1 coding question

Q-1)
n1 pairs of "{} " brackets
n2 pairs of "[] " brackets
n3 pairs of "() " brackets
I have to find the all valid combinations of all the pairs. I have to write the working code of it.
I gave him the solution with recursion and stack.

3rd face to face round
_____-

Interviewer asked some basics Questions on Design patterns, OOPS and OS,after the big Discussions of all the Questions he asked 1 coding questions.

1st Question
———————

There is a string, in which all the spaces are removed, we have to find the original string with the help of a machine which takes input a word checks that it is valid or not.

Telephonic Interview
————————————————-

The Interviewer asked to give a brief idea about my project.
After some questions on my Project, the interviewer asked 2 coding question

Q-1) tree to doubly link list. O(n) and in-place solution is required.

Q-2) A array of N elements, we have to replace all the elements with nearest greater which is present on the right side of that elements. O(n) is required.

After 2 days, they inform me that I am selected for the job. 

Amazon Interview | Set 35

July 28, 2013

On-campus, 1 MCQ round, 2 coding rounds, 4 face-to-face rounds.

MCQ round(45 min)
- 5 questions on mathematics, one was from probability, all easy 15 questions technical, from each-demand paging, dining-philosopher, humming codes, 3-4 C programs output, etc

1st Coding round–2 questions(45 min)

1. Given an array,find minimum distance between two given integers in the arrays. Note that the two given integers may be same.

2. Given three linked lists, each representing an integer, add them
eg

3-7-0-8

2-1

5-4-2

ans– 4-2-7-1

explanation- 3708+21+542=4271

2nd coding round(45 min)

1. Given an array containing both positive and negative elements, arrange in such a manner — 1 positive number, then 1 negative,then 1 positive and so on. If number of negative numbers are more,extra numbers should be kept in end and vice versa. Note the order of negative and positive elements should be same in the modified array and you are not allowed to use any extra space

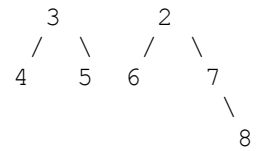
2. Given a binary tree, replace each node value by sum of its children value.

Face to Face rounds–

Round 1
1. Level order traversal and then level order traversal in spiral form. Only algo, no code

2. Given a dl representing the spiral level order traversal of a binary tree,convert it to a binary tree inplace. In Last level, nodes will be either to the right or left only. complete code in C

```
eg 1-2-3-4-5-6-7-8
o/p--
                1
              /   \
```



3. Glass pyramid problem.Measure amount of water in j'th glass of i'th row.(algo+code)

Round 2-
very few technical questions

1. Given an array which is first increasing and then decreasing,how will you search an element?(only algo)

2. Convert a n-byte integer from little endian to big endian.(code was required)

3. Find k max elements from a large file.(only algos)

Round 3

no technical questions at all

Round 4

After some personal questions, the interviewer asked some technical questions as well

1. Suppose we receive requests for a page, but we want to ensure that max no of request per sec is 'x'. If there are more than x requests,what will you do?
We want a continuous flow. How will you do that?

2. Suppose in a system, some processes are already running. Now when an user will give new task(or process), he will give a list of processes his process is dependent upon. Some of those may be running, some may not be running right now. You have to ensure that there is no contention, i.e., If a process, Pj is dependent on process Pi,
Pj should not execute along with Pi. How will you ensure that? Complete algorithm with code was required. The interviewer went on complicating the problem.
At last I used graph and 3 hashmaps to solve the problem. He was ok with it.

That's it. My last round completed and I was selected.

Amazon Interview | Set 34

July 27, 2013

First of all, a very very big thanks to whole team of geeks for geeks. It is because of them only that I was able to crack the interview process of amazon and get a job in my dream company.

No of Rounds: 1 MCQ round + 2 online test round + 4 PI

Type of Interviews: Campus Interview for freshers

MCQ round(Time) : 45 minutes 20 Objective Questions:

5 question on maths which included 3 on probability

Some c output questions easily available on geeks quiz

Questions on heap, hashing, time complexity of recursive functions
One sql query, one question on fcfs and round robin scheduling, page fault in demand paging, dining-philosopher problem,one on propositional logic, one based on Huffman code.

Online test 1 (Time): 45 Minutes
2 Questions:

1. Given three linked lists,where each linked list represents a number, add the three lists and return the resultant list.
5->1->2->NULL
9->1->NULL
7->2->2->NULL
Output :: 1->3->2->5->NULL
2. Given an array and two numbers x and y, find minimum distance between two numbers x and y. assume that x and y always exist in array and it may be that x and y are same also…

Online test 2 (Time): 45 Minutes
1. Convert a given binary tree to sum tree.

2. Given an array consisting of both positive and negative numbers, 0 is considered as positive, rearrange the elements such that positive and negative numbers are placed alternatively, constraints are that it should be in-place and order of elements should not change.

Interview Round 1(75 Minutes):
Technical Interview
Asked to give a brief idea about my project.

Question 1: Given a linked list,reverse every k nodes of the linked list.

Question 2: given a matrix of size m * n, place k students in such a way so that cheating in an exam could be minimized…. Was asked to just explain the approach, no code required.

Question 3: suppose a online chat between customer and serviceman, serviceman wants to reply to customer as soon as possible…suppose text which is to be sent as reply takes 10 sec for being typed. How can he make typing faster ?
My answer was using autoprediction feature, by which he will need to type less number of characters, so typing will become faster..
Then question was extended to how to store the words for being used in prediction…
I answered a trie data structure which allows prefix matching..
Then question was further extended to write a code to traverse all the words stored in dictionary in lexicographic order..

Interview Round 2(50-60 Minutes):
Technical Interview
First of all was asked to tell something about myself.
Then a detailed discussion about the project, conversation continued nearly for 20 minutes, he wanted me to explain him everything from the scratch.. I used genetic algorithm in my project..so he wanted to explain him the concept of genetic algorithm..
Then a coding question:: stable stock problem.
You are given prices of stock of a company at consecutive days in an array..write a code to find the maximum profit one can make by keeping a stock value for as long as possible..that value of a stock is called a stable stock value.
Example::
6 5 9 8 3
So maximum profit is 15, because stock of value 5 would be hold for 3 days. So max profit is 15.
The problem basically was a variation of finding index of next smaller element.
I solved it using the concept of largest rectangular area in a histogram where need to keep track of previous smaller will not be required.

Interview Round 3(60-75 Minutes): (Bar Raiser Round)
Technical Interview
Interviewer was very cool.. he first asked about me, did some casual talk to do away with my nervousness.
Infact, he told me that it looks like that you all have studied geeks for geeks very thoroughly so I am going to ask you a question that is not present in geeks for geeks. He challenged me it will be a question you have not heard of before. At the end of round, he showed me it was a question from top coder, but I had never heard of anything called top coder before.

Question 1: Given a string, find the longest sinusoidal sequence in it. If there are multiple such sequences of same maximum length, return the one which comes first in lexicographic order in a dictionary..
Sinusoidal means increasing then decreasing then increasing and so on.

Example ::
a r u n ::
a u n , a r n , r u n are three such sequences of length 3…. But, a r n is output since it comes first in lexicographic order.
Interviewer gave me hints that if I had to found the sequence in which all elements were increasing, then I answered LIS will give me the solution , this was the hint. So, basically, it was a variation of LIS. I answered it in O(n2) and 2n space….
Then was asked to do it in (n) space and o(n).

Question 2: Suppose a student needs to implement a bst structure to solve a problem, but instead he used a linked list…. Then give an example of input sequence, in which his implementation works… new value will always be added at beginning of a linked list.. so. Basically at each step after insertion , root of bst and head of link list should point to same node. I was asked to provide the sequence.

Interview Round 4(35 Minutes)
This round started of with some nontechnical questions.. what will I do in different situations?
They seemed to have found out every detail of terms involved in my project..so, there was a detailed discussion on project… my project involved concepts of statistics, so he asked me questions regarding stats…. This discussion went nearly for half an hour…. In the end, he told me lets see whether your project could bring you to amazon….
After the 4th round, I nearly have to wait for 4 hours before the result were announced. Finally, the interviewer said they were highly impressed by me and I was hired.
In total 7 students were selected among us.
Once again a big thanks to whole geeksforgeeks team.

Amazon Interview | Set 33

June 16, 2013

I recently attended a walk-in for Software development Engineer (SDE- 1) at Amazon, Bangalore.

Here is my experience of Amazon interview.

As I was from the same city, there was no phone interview. I have listed down all questions that I remember.

Round 1: Data Structures, Algorithms and coding (1 hour)

Interviewer just started off with questions without introduction and stuff.

1) Given a singly linked list, swap every 2 nodes, for odd number of input; retain the last node as it is.
Eg: Input: 5 13 15 18 20 11 6 7
Output: 13 5 18 15 11 20 7 6
I was asked to write the code straight-away.
Wrote the same, verified boundary cases and discussed.

2) Given a binary tree, find the number of pairs where sum of 2 nodes' values equal to k
Eg:

```
 1
2 3
4 5 7
```

Say k=7, output =2 (2+5, 3+4)
Suggested an approach where I'd use inorder traversal of this,
Then interviewer asked me to solve the simplified problem, find k in sorted array instead of tree.
Got solution for this one, to have 2 pointers at each end, and traverse accordingly.
I was asked the approach for extending same to BST.
Then, I implemented the same for BST using stack.

Round 2: Data Structures, Algorithms and coding (1 hour)

1) Given input as k sorted arrays, generate a single sorted list as output.
Eg:
Array1: 1 5 8 9 11 ….
Array2: 2 12 24 44 …..
.
.
Arrayk: 3 15 79 115 ….
Output: Array1: 1 2 3 5 8 9 11 12 15 ….
Discussed the approach, and complexity, then wrote the code for the same.

2) Given a function isGreater, compare user defined objects and then return the object that is greater than all other objects.
Twist: obj1 > obj2 and obj2 > obj3 does not mean obj1>obj3
I asked for the use case for the same, as I was not convinced with the problem.
He gave an example of games/ 1 team winning another.
Discussed the approach and then wrote the code.

3) Given an input sentence, output the non repeated words in the sentence.

4) How are maps implemented?

Interviewer then clarified my questions about Amazon.

Both first and second rounds were at similar difficulty level.

If the interview feedback was bad for any of these, the candidate was eliminated. If at least 1 of these went well and other "not sure", then too candidate is called for next rounds.

Round 3: Hiring Manager round (1 hour 40 minutes)
Discussed on my current roles and responsibilities

why do you want to join to Amazon?

What are your accomplishments in your role so far?

What are the things that you're not good at and need to improve?

Serialization of Binary tree. Given 1 traversal is it possible to re-construct the binary tree.

Write code to reconstruct the tree given any 2 traversals.
I took in-order and post-order traversal, discussed the approach and wrote recursive solution.
Was then asked the approach for iterative.

Round 4: Culture Fit Round
This surprisingly had a data structure question first.

1) Given a n (large number) lists of customers who visited n webpages on n (large number) days, design a data structure to get customers who have visited the website on exactly "k" days and should have visited at least "m" distinct pages altogether.
Was then asked to improvise the solution as much as possible

2) Details on my previous project and job profile

3) Challenging situation faced

4) Why should we hire you?

Then, he answered some of my questions.

Round 5: Coding, Algorithm and data structures (Technical round with a senior developer)

Started with questions straight away

1) Least common ancestor of a binary tree (Solution and Code)

2) Given a 2 dimensional array sorted vertically and horizontally, search for an element and return true if the element is present. (Algorithm, Code and Complexity)

Example

1	5	13	29
11	16	25	38
45	49	52	57
51	54	59	66

3) Something on count sort.

4) Print binary tree in zig-zag order..

5) Gold box problem (Approach)

There are ‘n’ gold boxes placed in a row, each having different number of gold coins.

2 players play a game, where the motive is to collect the maximum number of gold coins. Each player can see how many coins are present in each box, but can get a box from either end only, on his turn.

Design a strategy such that Player1 wins (Assuming both players play smartly)

I got the hiring call after couple of days, after my last round of interview. They said feedback was very positive and they’re happy to hire me.

Was so happy 😀😀Thank you..

Amazon Interview | Set 32

June 3, 2013

I would like to contribute for GeeksForGeeks by sharing my experience of Amazon Interview process. This was for a SDE position in Hyderabad. I have almost 2 years of work experience in Samsung.

1st Round: Written
Test was on Interview Street Platform.

Qs-1) A function printMostFrequentWords, which takes in an array of strings, was given. It is required to print a list of all the letters that occurred with the highest frequency in each line of the array, followed by the frequency.
The list of letters should be an alphabetical list of upper case letters followed by an alphabetical list of lower case letters.

Sample Test Cases:

Input #00:

When riding your bicycle backwards down a one-way street, if the wheel falls of a canoe, how many ball bearings does it take to fill

up a water buffalo?

Hello Howard.

Output #00:

e 6

al 7

a 3

Hlo 2

Qs-2) http://www.geeksforgeeks.org/construct-a-special-tree-from-given-preorder-traversal/
–Variation of this one

Qs-3) http://www.careercup.com/question?id=12998667

Third case was a bit tricky.

Qs-4) Rotate an M*N matrix by 90 degrees. There was no function given in this case. Everything should be assumed by you only.

Qs-5) Delete the Kth Node from a linked list.

I solved 4 questions with all test cases while for another 1 only 10/15 test cases passed.

2nd Round: Telephonic

Qs-1) Spiral level order traversal of a tree. (Use two stacks)

Qs-2) A person can jump 1 or 2 steps. No of ways of reaching the top of n stairs. (Try for O(1) space.)

Qs-3) Find the longest substring in a string with exactly 2 unique characters. The substring should not contain more than two different chars.

So, aaaaabbaaa is a valid substring

Also, ccaccccaccaca is a valid substring.

Need to write code for the 3rd qs.

Expected = O(n)

I answered all the 3 questions and was confident of receiving the call for onsite which I did.

F2F ROUND 1:

Qs-1) The question was to print a tree vertically. Please note it was not asked to get the sum at each vertical level. We have to print nodes at various vertical levels starting from the leftmost vertical level to the rightmost vertical level.

I suggested array of vector then a hashing. Finally I gave a solution based on DLL.

Code was written using DLL only.

Qs-2) Only approach was asked on how will you save a binary tree in a file(Not a BST)

There are no assumptions on Binary tree.

This round went well for me.

F2F ROUND 2:

Qs-1) First I was asked to design a Data structure with O(1) insertion and O(1) search. I told about hashing. Then he told me to get a random number from the current list of numbers which have been inserted into my Ds. So I maintained an array storing pointers to the hash table.(Assume no Collision, he told so).Then he said O(1) deletion also. I was stuck on this I was not able to make both deletion and getRandom in O(1).After Some Discussion he moved on.

Qs-2) He told there is a range, defined by a min val and a max val. In a given array I had to find all elements within the range. I told him its only possible in O(n).We have to look at

each element. Then he told me to assume array as sorted. Then I used Binary search for finding indexes of ceil of min and floor of max to find the elements in the range.

This round went ok for me.2nd question i wrote proper code with all edge cases, but in first I got stuck a bit.

F2F ROUND 3:

Qs-1) In a binary tree, a complete path is defined as a path from root to a leaf. The sum of all nodes on that path is defined as the sum of that path. Given a number K, we have to remove (prune the tree) nodes from the tree which lie on a path having sum less than K.

Note: A node can be part of multiple paths. So we have to delete it only in case when all paths from it have sum less than K.

I was able to solve the problem and write correct working code for this.
(Hint : Think of a bottom up approach.)
Note: Values in tree can be -ve also.

Qs-2) A robot problem: No. of ways to reach from 0,0 to m,n in a m*n grid. I had to tell recursive function only. No code required.

This round went very good for me. The first question was a bit tricky but solving it raised my confidence.

F2F Round 4 with Hiring Manager:

Qs-1) This was mostly a HR Based round. A lot of questions about my previous work, my initiatives, challenges I faced and many other questions.

A simple question on matrix was also there. Fill rows and cols with ones if a 1 is present in that row or a col. Code also required.

Question based on shipment and orders etc. Eg: What all things to take care in b/w of order placed and item shipped. What all factors and things you will consider.
I was being interviewed for transportation team. So questions based on it.

Overall, the round went well

I returned to Bangalore that night.
Few days later, I got a call from HR saying I am very close and I need to appear for another round in Bangalore office.

F2f Round 5:

About half an hour Hr based discussion.
Then two Technical questions with code:

Qs-1) In a binary tree, return true if all leaves are at same level and return false if all leaves are not at the same level.

Qs-2) An array is given which is first increasing and then decreasing. Find the pivot element. Need to take care of all the edge cases.

This round went well for me. Mostly this round was on soft skills. I did well in coding questions and wrote proper code for both.

In the evening I got a call from HR that I was selected. 

Amazon Interview | Set 31

June 2, 2013

Recently I attended the Amazon walk-in and got selected for the position of SDE I.

Written test:

1. Write a code to convert tree to DDL(assume tree node contains pre, next pointers and set as null intially.)

2. WAP to encode and decode string.
aabbbbcccd <->a2b4c3d1

3. Find the sum of elements in after nth iteration for below operation on array.

```
original array  4 6 8 3 6    sum = 27
iteration1      -2 -2 5 -3    sum = -2    (a1= a2-a1)

iteration2:     0  -7  8     sum= 1

iteration3:       7  -15     sum =-8
```

Hiring Manager:

1. Find the nearest leaf node from given node in binary tree..
use post order traversal.. like LCA in binary tree
2. Find the first k largest numbers from large file size. Explain solution for

    1. When we have space to store K elements in RAM

    2. When we didn't have space to store K elements in RAM

Tech:

1. Design N-ary tree, to make sure that lock and unlock operations can be done with minimum complexity (height of tree)
a node can be locked when its ancestors or successor are not locked.
we can a unlock a node a any time.
2. a[] = {a,b,c,d,e} b[]={f,g,h} result should be = af+bg+ch+df+eg

Tech:

1. Find maximum product of subarray in given array of integers
2. Design T9 dictionary

Bar Riser:

1. Design a tree, in which a root can have unlimited children and write a code to print each level in separate level

2. Print the anagrams present in a huge file (each line in file contains one word and you didn’t have any constraints like limited memory etc..) for a give string

use trie or hashmap

Like all Amazon interviews in GFG, here interviewer more concerned about edge cases and perf perf perf perfect code.

Thanks a lot GEEKS FOR GEEKS and my dear friends Ramesh, Purush, Jhadey for helping me in preparation.

Amazon Interview | Set 30

May 11, 2013

I have attended the interview for Software Development Engineer position and got the offer from Amazon.

I spent a lot of time in GeeksforGeeks going through the precise and simple explanations of complex problems, which helped me to sharpen my mind. Really, its a great work by the geeks and I am happy that I am a part of it.

The following were the questions.

Round 1 : Write a program to solve the below problems. (Time 1.30 hrs)(Written Test)
1. Given a string in the form of a Linked List, check whether the string is palindrome or not. Don't use extra memory. Give the time complexity. The node structure is

```
Class Node {
          Char data;
          Node next;
}
```

2. Given a Binary Search tree along with the parent pointer, find the next largest node for the given node. Give the time and space complexity. The node Structure is

```
class Node {
     Int data;
     Node left;
     Node right;
     Node parent;
}
```

3. Given a sorted array which is rotated n number of times. Find out how many times the array is rotated. Time complexity should be less than O(n).

Round 2 : With Team Member
1. Tell me about yourself.

2. Explain your project.

3. Given a Binary tree, find the vertical sum.
….a. I gave a solution using hashmap. There were discussion about the problems (time and space complexity) in using hash map. Then due to its cons, he told me to use some other DS to solve the problem.
….b. Then I gave a solution using Array. There were discussion about how it can be used, time and space complexity and its pros and cons.
….c. Code using Array.

4. Given a matrix mxn, where all the rows were sorted, print the elements in the matrix in a sorted order.
….a. I gave a solution with O(mxmxn) time complexity.

….b. He wanted a solution in O(mnlog(m)) time complexity and gave a hint to use heap.
….c. Code for the same.

Round 3: With 3rd Level Manager (culture Fit)
1. Tell me about yourself.

2. Explain Your accomplishments.

3. What you are proud of yourself?

4. How you will handle the conflict with the team member?

5. Lot of behavior oriented questions.

6. Given a String, remove the duplicates in the string.
….a. Lot of variations from the same problem.
….b. Asked for a solution in different time and space complexities and the complications involved.
….c. I guess the communication skill might have been tested here.

7. Given a floating point number, write a program to convert it into a string. The number of digits after decimal point can be more than 1000.

Round 4 : With Manager
1. Can you tell me about yourself?

2. Explain the projects you worked on?

3. Given a Binary tree, connect all the leaf nodes in the form of a doubly linked list. Don't use extra space.

4. A scenario was given about two robots and its functionality. Write a program which will be running in both the robots which will perform the specified functionality.

5. Given an integer, find the next largest integer using the same digits as in the given integer. For example, if 12345 was given, the program should return 12354.

Round 5 :
1. Tell me about yourself.

2. Explain what you have done in your previous company.

3. As I have worked on a product and they told to explain the product

4. What are the developments you have done and what impact it will be having?

5. What will happen to your development, if the product Is migrated?

6. Questions on threading.

7. What is a thread safe code? Explain.

8. What is a process and thread? Differences?

9. Given a binary tree print the elements in a zig zag order.

Thanks a lot for Geeks team.

Amazon Interview | Set 29

May 5, 2013

I am very much excited for sharing my experience for Amazon, i went through 6 rounds and really enjoyed a lot for facing all of them and i feels like in each round that GEEKSFORGEEKS is the one the best site which gave me lot of ideas for solving the problems, This is THE BEST site for coding for getting good questions and also for improving our skills and creating our base SOLID.

1st round >> ONLINE test

1) Convert a BST to Double Linked List

2) Count the number words words + spaces + special chars in a given string

3) Print kth Lasgest node of the given tree.

4) Write the complete code for rotating the given matrix.

Solved three successfully with all cases but for one some cases was missing because of network issue i was facing time problem.

2nd round >> Telephonic

1) Level order traversal (Both approach recursion && Queue)

2) In O(1) – getMin, getMax, getTop,push,pop

3) Find the least positive missing number in an array.

4) Print all permutations of the given string

For all i need to write the code, and i was feeling like i was doing fast and being on expectations of the interviewer, he was so happy with me.

3rd Round >> FACE TO FACE (It was nice, it went thru 1hr)

1) Write a code for inverting the values of BST and return the new tree's root

(In place i have to do this, first i have given solu. with O(n) space with O(n) complexity)

2) Finding the element in O(m+n), in a sorted matrix which is sorted in row as well as in column.

(I said i know this, so i just told the approach and we skip that !!)

3) Project questions, infact in all rounds it was there!!

4) Rope Puzzle :: 2 ropes are there and u need to find the 45 mins(Very generic Google Puzzle)

4th Round >> FACE TO FACE (It was Amazing, it went thru 1hr 30 mins)

1) Find a median in running stream of numbers.

2) Find a k best or max values in the running stream of numbers.

3) Project Questions !! i Love that !!

4) State machine questions !! Gaming Questions (Bcoz m a game developer)

Questions on garbage Collection, Virtual machine (Bcoz i did project on it)

Anyway i love all those part.

5) One very nice question, i need to calculate the area for rain drop which will be holded for bar graph(Its basically a very real world problem, i love to do that, even i did mistakes but they guys are really awesome they helped me out to get rid of my problems)

5th Round >> FACE TO FACE (It was Damm Amazing, it went thru 1hr 15 mins)

1) I need to write recursion function for a robot which has to move from one location to other location in a grid.

In recursion i took time to write the base cases, but finally with some hints i was able to make it.

2) I need to code for k-heavy path approach and also need to write its recursion.

There also i was continue taking to the interviewer and clearing my doubts and using the hints given by him. Finally i was able to code it and do the recursion also.

Every time i need to write the recursion in mathematical form and calculate the Complexity also like we have to do normally for detecting the complexity.

I love the mathematical part and coding, its in my blood !!

3) Project Question !! Scalable problems !! Dealing with N dimension study and mathematical problems, even covering my whole resume.

Finally he was very happy and said to me that you need to think proper then code or design, rest is awesome !!

6th Round >> FACE TO FACE (It was with the Hiring Manager,i guess, it went thru 45mins)

1) He asked me about my whole projects and lots of about my resume and my challenges faced till now, it was good to explain all those.

2) He asked me to design an approach which will search all the valid combinations of a given string.

I have given some approaches like implementing TRIE, and explained the pros and cons for it and also the complexity of it.

Then i modified it and explained the Other approach which is better than the above by using HASH MAP and INDEXING with buckets if valid words.

We had lots of discussion on it. and Finally he said we are looking for guys like you.

Finally i have the offer Letter From Amazon and He asked me for Coffee Or Cold Drink. I Have taken Coffee.

NICE EXPERIENCE !! I LOVED ALL THE INTERVIEWS AND ENJOYED A LOT !!

Finally a Gold Medalist 2yr Exp. guy who is doing a very nominal job, got a Right place to work which is AMAZON !!

Amazon Interview | Set 28

May 4, 2013

Hi, I was recently interviewed for SDE1 position for Amazon, Hyderabad but was not able to make it through. Although I wasn't selected but it was a good experience and GeeksforGeeks has been very helpful.

Following were interview questions-
I had one written round and one telephonic round before 4 in-face interviews in Hyderabad.

Round 1 (Written):
There were four questions which had to be submitted in a time span of two hours. Questions were:
1. Given a character string, display the characters that appear more than once in that string.
2. Rotate a matrix 90 degrees to right
3. Convert a BST to DLL.
4. Find kth largest element in a given BST.

Round 2 (Telephonic):
1. First question was to get two numbers fro a BST whose sum was equal to k. I answered it using a preorder traversal to get a sorted array and than starting two index from both ends to find if two elements with sum as k exist or not. He than asked if it can be solved without using an array or extra space. I tried solving it by traversing from two ends of the tree in preoder and reverse preorder fashion and it took some time to code. Dry run of the code seemed to be right but I wasnt sure. Anyways the best way of not using extra space can be to convert tree to DLL (in space) and use the same technique as used on array.

2. For second question I was asked if I had heard the question before or not. Question was that a a matrix is given with its rows and columns sorted and an element is to be searched in that matrix. I had heard the question before but had not solved it and told the same to the interviewer. After thinking for a while I could get an algo by starting at the rightmost element of the first row. If element if bigger we move down or else we move right. The solution was fine but he doubted that I had solved it earlier.

3. He asked to write a program of finding the square root of a number without using library functions. I had done it before and told him the same. I used Newton-rapson method to get the solution but he wanted it through something on the lines of binary search. I almost got the solution but may be I was running out of time so he dropped the question there only and asked me to dictate the solution of 2nd problem.

Two days later I got a call that I have cleared my telephonic round and have to be present in Hyderabad for further rounds(four). Arrangements done my Amazon and I appeared for the further rounds on 27/4/2013 in their Hyderabad office.

Onsite:
Round 1 (Technical):
1. First question was to find the vertical sum of a binary tree. I told him the solution using and array/hash. Whenever we move left we decremented the index while moving right we

increment the index. The solution looked fine to him but he wasn't very comfortable with negative indexing. So he asked for another solution using doubly linked list. Initially I wasn't getting it but when he gave some hint I was bale to solve it but it took some time to cover edge cases. With the final solution he looked convinced.

2. Next question was to have Stack operations of Push, Pop, and FindMax in O(1) time. I started doing this using only one index of max variable but than I realised I needed max index at all levels so gave him a solution using two stacks. One having the element and the other having the corresponding max index. He looked convinced with the solution.

Round 2 (Technical):
1. In second round there were two interviewers and coincidentally one of them was the same guy who took my telephonic interview. First question was related on how to chose the 'related' items list whenever a product is displayed on Amazon website. the problem was to find the least related product for a given product. Initially I answered using n-ary tree but told him that we would have duplicate entries. He asked for optimized solution so I suggested using adjancy-list nut finally realized that it can be solved using graphs. They were convinced and asked to code. I solved it using a Queue so while traversing a matrix we pushed in the elements in the queue with their level of relation. They were convinced with the solution.

2. Second question was to delete an element from doubly linked list. I solved it but missed out on and edge case where the element to be deleted is not present in the list. I added that check later.

3. Third was that for a given BST invert the signs of the elements and finally have a new BST. It clicked my mind that after sign inversion it will be a mirror tree and gave the solution for the same.
Till this time feedback looked fine.

Round 3 (Technical-Managerial):
1. The next interviewer was senior guy and asked me about my work. Explained him in detail.

2. Later he asked me that for a given binary tree having three address fields i.e. left, right and bfs successor, left and right fields are filled and the successor field is to be filled. I solved it using level order traversal with a queue but he wanted solution without using extra space. I was taking time to solve it when he gave hint about keeping track of the parent. After this hint I was able to solve it with few conditions missing but with his intervention I was able to give a working code (as looked to him and me).

Round 4 (Technical-Managerial):
1. There were two interviewers. First question was tell me about yourself and your work.

2. Given a m*n matrix, we need to find the number of ways by which a bot can reach the (m-1,n-1) block if bot can move only right and down while starting from (0,0). I gave him a solution using DP. Build the recursion tree showing the final solution. He didn't ask to code but asked to finds the recurrence relation. I got stuck I don't know why. I guess this was the start of decline. he gave some hints and I was finally able to write it, still.

3. For a given binary tree and a key, prune the tree with all the paths (root to leaf) that have sum less than or equal to k. I was able to solve it with some hint. The solution looked convincing.

Four days later I got a mail stating that "*Unfortunately, we are unable to take your candidature further, at the moment. However, your credentials are extremely impressive and we wish to retain your details on our active database. We shall get back to you as soon as another similar opportunity opens up*."

Amazon Interview | Set 27

April 22, 2013

Hi, I was recently interviewed for SDE1 position for Amazon and got selected. I have 1.5 year experience in java. Geeksforgeeks helped me lot. I am very thankful to Geeksforgeeks team. Following were interview questions-

Two telephonic rounds followed by 5 F2F interviews.

Round 1 (Telephonic):

1. There is a dictionary already implemented. Write a method, which takes input String without space, to prints all subsets of the input string which is present in dictionary.

Example: Dictionary – a*
…….Input- aaabaa
…….Output- a,a,a,aa,aa,aaa,a,a,aa

2. There is a dictionary already implemented. Write a method , which takes input String without space, to replace the characters from the strings which are not present in dictionary with -

Example: Dictionary – a*
…….Input- aaabaa
…….Output- aaa_aa

Interviewer was cool. Did not code properly (lots of bugs were in code), but gave good approach for first question. For second question solution sent in a mail.

Round 2 (Telephonic):

1. Write a program to remove duplicates from array of prime numbers.

2. Write a program to return nearest elements from a binary search tree for input element.

This round was very good. Interviewer was very happy with my approach for both questions. Code did not have big bug.

Round 1 (F2F- Problem Solving and coding):
1. Tell me about yourself.
2. Write a program to find top 10 elements on an array of integers.
Don't remember much. Questions were easy. This round was very good. Interviewer was happy with solution.
3. Write a program to calculate a^b and store it in floating point representation.

Round 2 (F2F- Computer Fundamental):
1. Tell me about experience in past job.
2. OOPS concepts- Polymorphism, Inheritance, Encapsulation, Abstraction.

3. Aggregation and Composition.
4. Design patterns which you have implemented.
5. Write code to implement Singleton design pattern.
6. Design a system to implement options in Pack of cards.
7. Difference between Windows and Unix.
8. Threads, Synchronization, Deadlock.
9. Other subjects which you studied in your academics.
10. Most challenging work you ever faced.
11. Discussed about current project, role.
This round was fair enough. I was not able to discuss questions on subjects which I studied in academics.

Round 3 (F2F- Data Structures and Algorithms):
1. Tell me about yourself.
2. There is a 2d array. Write code to find the path with maximum sum. You can only traverse i+1 or j+1.if i is row number and j is column number.
I solved it using dynamic programming
3. In a binary tree find the least common ancestor for two nodes. (Write code)
4. Similar to 3rd question. Write a program to find least common ancestor in binary search tree.
This round was very good. Finished it only 40 mins.

Round 4 (F2F- Managerial round):
1. Tell me about yourself.
2. Copy Linked list with orbit pointer.
3. Write a code to find top hundred elements in a data set which cannot be loaded in RAM.
4. Typical parenthesis checking problem.
5. Most challenging work you ever faced.
6. What will do if you get task which is ambiguous.
7. At what extend you will be frustrated if you always get ambiguous problems.
8. How many members in your team in current organization. What's your role? Questions on current project.

Interviewer was very cool and friendly.

Round 5 (F2F- Bar raiser round):
1. Tell me about yourself.
2. Discussed about current project.
3. Write a program to find number of inversions in an array.
Example- Array 2, 5, 3, 1,10
Inversions (2,1) , (5,1), (3,1), (5,3)
Answer will be – 4
Gave solution of complexity o(nlogn) . Interviewer gave me hint for that.
Hint- Divide and conquer approach.
He asked me to write code which doesn't have any bug.

Amazon Interview | Set 26

April 20, 2013

Hi, I am Mayur Kale,I was recently interviewed for SDE1 position for Amazon in our campus and got selected. Geeksforgeeks helped me lot. I prepared only from Geeksforgeeks.org. I am very thankful to Geeksforgeeks team.

Onw online coding test followed by 4 rounds of F2F interviews.

Online Coding Test (2 Problems,20 MCQs, 1:30 hours) From Interviewstreet
All problems had multiple test cases for which the code was validated against.
1. from input string we have to print character which occurs maximum number of times.

Face to face: Round 1(Technical, 1 hour):
1. Given a boolean matrix mat[M][N] of size M X N, modify it such that if a matrix cell mat[i][j] is 1 (or true) then make all the cells of ith row and jth column as 1 (time complexity expected was O(M*N) and space O(1))
Solution: http://www.geeksforgeeks.org/a-boolean-matrix-question/

2. Given binary tree, if we draw a line from root then we have to print all nodes on that line.

Code for both questions was required and some other discussion happened..

Face to face: Round 2(Technical, 1 hour):
1. Given string we have insert %20 on each space and input string has enough memory to contain output string.
(time complexity expected was O(n) and space was O(1).

2.merge point of linked list.
(I told I know this question so he moved ahead..)
3.Given binary search tree in array form and we have to check whether it is fully binary tree or not..
(I gave O(n^2) solution but He was expecting O(n) solution after some discussion I managed to give answer in O(n) complexity…)
4. Given that integers are read from a data stream. We have to find k maximum elements from that stream…
(I gave solution of insertion sort,then come to heap)

code for all questions required and nice discussion was there…
He was very impressed with my answers…

Face to face: Round 3(Technical, 1 hour 20 minutes):

-He asked me to choose topic on which questions should ask..
I chose OS…
-some questions on paging and virtual memory.

-If we use 8 GB RAM for 32 bit machine what will happen?
It was nice question..
He was very impressed with answer.
-Some discussion on Networking(DHCP and DNS).
-Some discussion on Linker and Loader.
-Some discussion on JAVA.
-Some discussion on DBMS.

-one puzzle
A champagne pyramid is a pyramid made of champagne glasses , each of equal capacity say , n. The pyramid begins with one glass at the top level , two glasses at the second level , then three below that and so on up to infinite levels. A level x of the pyramid thus has x no. of champagne glasses.

A steady stream of champagne is poured down from the top level,which trickles down to the lower levels. What is the distribution of champagne in the glasses at a given level i.
(I told I know this puzzle then he moved ahead..)

-Give a Building with n floor. A person can take 1 step or 2 step to climb. Find the number of ways to reach nth floor. Code was required

Interviewer was very happy after that.

Face to face: Round 4(Technical, 1 hour 20 minutes):
It was like semi HR round.
1. Why Computer science?
2. Given an array of integers which is initially increasing and then decreasing, find the maximum value in the array.
http://www.geeksforgeeks.org/find-the-maximum-element-in-an-array-which-is-first-increasing-and-then-decreasing/
3. Modified k heavy path in binary tree problem.

In evening they told me result and I got selected in amazon. It was very nice experience for me.

Amazon Interview | Set 25

April 19, 2013

Hi, This is Pandu. About 1 month back I had attended Amazon Interview In hyderabad, it was total of 8 rounds which includes 2 telephonic and 6 face to face and the whole process was lasted about 25 days because of unavailability of all the interviewers. The whole was very painful for me as before and after attending interviews on each interviewing day, I had to spend with some tension & anxiety. I was interviewed for SDE 2 position

The following are the questions:(For all the algorithmic questions , working code is required, they would take those papers and discuss in their internal meeting after all the rounds)

Telephonic Round 1(with Lead developer):
Q1)Given a snake and ladder game, write a function that returns the minimum number of jumps to take top or destination position.
You can assume the die you throws results in always favor of you.

Telephonic Round 2(with SDE 1): (after 5 days of 1st telephonic)
Q1)Given an integer array and an integer value X, return two elements in that array such that sum of them equals to X.
– Here he asked about different ways to solve it and pros and cons of each solution.
(For Hash map solution , He was looking for getting solution in only one pass)
Q2)discussion about my project details and challenging task
Q3) suddenly you web application has become very slow on clicking particular URL. How would you debug it and solve the problem

Face to Face round 1(with SDE 1): (after 4 days of 2nd telephonic. 3 faces to face rounds were taken on same day and lasted about 5 hours)

Q1) Given a sorted array and a number write a method that returns the number of occurances of given number
Q2) You have given a dictionary of an alien language in which letters are same as English letters but their order is different.
Your task is sort the letters or give relationship b/w letters using that disctionary. note: the dictions may conatain 1 to n words.

Face to Face Round 2(with SDE 2):
Q1) In our project we are using Java Spring framework. He asked to implement spring container.
Q2) Implement LRU caching. After that asked me two different cases (1) required element is already in chase , 2) required element in not in cache and cache is full)
Had to explain those two cases by walking through your code.
Q3) You are given a faulty binary serach tree in which only 2 nodes are misplaced(swapped their positions with each other). write a method
that takes root of that BST and return the root of the corrected binary tree.

Face to Face Round 3 (With Lead Developer) : (Design question)
Q1) Given an URL you need to analyze all the images(they may be in 1000′s of number) and

return the cumulative quality of images present in that url.
lets say: you can configure image quality as very good,good, average, poor..etc, so you have to return one value among them. The given URL may conatain several othe URLs and they also conatain lot of images . you need to consider all of them. lot of questions like how to avoid visiting same url again,
how would you determine the quality of an image if you encounter an url that contains only an image..etc.
Q2) Design Elevator system. And then write an algorithm for that Design such that, the user request should be completed in logN time in a N story building with M elevators,
This round was lasted more than 2 hours.

Face to Face Round 4 (With Hiring Manager): (after 5 days of last 3 f2f rounds)
Q1)Discussion about my project details
Q2) Design Question: Design Clustered caching system for an web site like Amazon.com. In which millions of web servers deployed over the globe and only one inventory Database system
Q3) Design question: Design only Train search functionality of IRCTC

Face to Face Round 5 (With Bar Raiser): (same day following Hiring manager interview)
Q1) Discussion about my project and Challenging task
Q2) Design Question: In an online teaching system,there are n number of teachers and each one teaches only one subject to any number of students.
And a student can join to any number of teachers to learn those subjects.
And each student can give one preference throuch which he can get updates about the subject or class timings etc.
Those preferences can be through SMS or twitter/facebook or email..etc.
Design above system and draw the diagram for above.
Q3) coding and algorithm: There is a N-ary tree in the 3d Space. and you are standing on right side of that tree . Print the only
those nodes when you looked at that tree.
(which is like printing rightmost node in each level of that tree. He would not tell this, you have to conclude this by drawing a tree like that).
After writing the code for above one, he was asked me to print them in an order in which 1st one followed be last one followed by 2nd first one followed by snd last one..etc.)

Face to Face Round 6(some one who is in very high level, guess director to a technology):
(After 1 week of last interview)
Q1) Lots of discussion on my current project. Different behavioral questions were asked during the discussion.(about half n hour discussion)
Q2) Given a cube of size N. which was constructed by N^3 number of 1 unit smaller white cubes. Now you dipped that cube in a black color paint and taken out.
after that how many cubes are still in white color. Prove your answer(by writing mathematical equations)
Q3) There are N bolts each of which different size and N nuts, they are also with different sizes. and each bolt fits with exactly 1 nut.
Give an algorithm that combines those N bolts and nuts into N pairs of Matched bolt and nut.

HR told me on last interview day that I would be notified by the result within two working days as already the whole process was delayed for so many days. I had waited for almost 1

week and send them mails & called them about my candidature but did not get any response. I was almost lost hope. But, Finally after 8 days of last interview, got a call that I was offered SDE1..(I guess, They were not completely satisfied by in design part but I did better in algos, problem solving and coding part and as a result I was offered SDE 1). In the end I rejected to join at Amazon as I got another competitive offer.

Amazon Interview | Set 24

April 12, 2013

Hello Guys, I had 6 rounds(written + telephonic+ 4f2f interviews) in hyderabad centre of Amazon.

I was 90% sure that I would clear the interview but I got rejected. The only reason I felt I was rejected was that the interview process was immature. The interviewer interviewing was a guy with 1yr of work ex expecting solution in the manner he wanted, which was pretty unexpected from a technology giant like amazon.

Every round of Amazon would have basic question like what you do etc. But all that is just formality, it doesn't count since one interviewer stopped me in between and said we have less time lets talk about problem solving(Which was again not expected from technology giant)

Also, for those writing written this month, the written round would have the same questions as I have listed below. So please solve this, before going for written

Anyways, these were my questions:

Written(Interview street) – 3 Questions:

a) General code for coin denomination problem where the input was an array containing the coin denomination and the sum we want.

b) Rectangle overlap problem(Can be found in geeksforgeeks)

c) String Matching Problem(Wrote KMP)

Telephonic Interview:

a) Convert BST in place into doubly linked list

b) Given a Binary Tree is it a BST

If you miss one edge case, you are out of the interview. This is what they check and nothing else. They don't check your logic, they only see if you write proper code. So always start with brute force and write proper code.

F2f interview(1st round) – Very easy

a) Given a number is it divisible by 3 and 5

- Only catch here were the edge cases and nothing else

b) angle between hour hand and minute hand

c) Revere bits in a binary

d) Get the kth node from end of linked list

F2f inteview(round2)

a) It was basically on writing multi-threading code(Write multi-threaded code for Enqueue of Queue using linked list)

b) Asked about basic complexities in Queue, hash and tree

c) Window Problem(In an array, find the minimum of the set in a given window). There are many solutions using hash, brute force. But the dequeue answer is what he was expecting.

I gave the deque answer

Any other answer to this problem was a reject

F2F Interview(Round -3)

a) Given a doubly linked linked, delete the occurrences of duplicate element from it. (One miss of edge case and out again)

(for eg) If you write, temp->prev->next = temp->next without actually adding the condition, if(temp->prev) then temp->prev->next = temp->next

b) Given a matrix with ordered rows and columns(Rows are sorted 0′s followed by 1′s). Find the row with maximum 0?s(linear time)

I answered it

c) DataStructure with Insert O(1), Deletion O(1) Search O(1) and ReturnAnyElement O(1)

Again answered this using augment of hash and doubly linked list

d) Given a tree with negative and positive numbers, return the root with maximum sum in its sub-tree

F2f interview(round-4)

a) It was basically a design interview where I was told to some OOPS design

b) Given a stream of 0′s and 1′s(You Tube). Find the first occurrence of 1 in it. Then the question was changed to a string instead of a stream.

Finally, after giving 100% it was reject. So according to my experience, if you dont give 100% you are out or else it is ur luck that you get through amazon’s process.

Moreover, currently they have started exploring candidates by sending two interviewers which actually means that the one is new to interviewing and other is experienced. Hence, basically they are playing with interviewers.

If you want the answers for questions, please comment I will post it.

Amazon Interview | Set 23

March 24, 2013

I was recently interviewed for SDE1 position in Amazon Bangalore. 1 online coding test followed by 5 rounds of F2F onsite interviews.

Online Coding Test (4 Problems, 2 hours) From Interviewstreet
All below problems had multiple test cases for which the code was validated against.
1. Code for converting floating point decimal number to binary numbers. If the number cannot be converted, state so.
2. Given an integer array A of size n. Given an integer k < n. Construct an array B, such that B[i] = min{A[i], A[i+1], A[i+2], A[i+3], ……., A[i+k]}
Solve in time complexity better than O(nk).
Hint: use min Heaps
3. A singly liked list. Can have a loop. Detect it and find the size of list.
4. A singly link list and a number 'K', swap the Kth node from the start with the Kth node from the last. Check all the edge cases.
Sample Input: 1->2->3->4->5->6->7->8 and K = 3
Sample Output : 1->2->6->4->5->3->7->8

Sample Input: 1->2->3->4->5->6->7->8 and K = 10
Sample Output: print error "LIST IS OF LESSER SIZE".

Face to face: Round 1(Technical, 1 hour):
1. Given a K sorted array. Sort it with minimum time complexity.
O(nlogk) solution was expected. Code was required.
2. Given a file with many product name of an company. You have to find out unique name in the file. Suppose mobile,laptop,notepad,desktop,pen,mobile,pen .. etc is given we have to print laptop,notepad,desktop. Pen and mobile should be remove due to duplicity.

Code was required.I gave o(n) time complexity solution for it using 1 hash table and Doubly Link List.

Face to face: Round 2(Technical, 1 hour):
1. Given a Sorted array with one missing number. I have to find first missing number.Code was required. I gave solution with o(logn) time complexity.

2. Give a Building with n floor. A person can take 1 step or 2 step to climb. Find the number of ways to reach nth floor. Code was required

Face to face: Round 3(Technical, 1 hour 20 minutes):
1. Given an Sorted Array with duplicates I have to find first index of any duplicates. Suppose 12222333355578999 first Index of 2 in 1. Code was required.I gave O(logn) Solution.

2. Given an binary tree. Traverse it in zig-zag manner. Code was required.Solved using a 2 stack.

3. In a snake ladder game without snake and ladder . If some one is playing then we have to find probability to win the game of any player. Condition of winning is if you are on 96 and 5 comes in dice then you loose the game and If you are at 96 and 4 comes then only you will win the game. But you cant use dice more than Y time.

I gave o(XY) Solution through DP. Where X is sum.

Interviewer was very happy after that.

Face to face: Round 4(Manager, 1 hour 20 minutes):
1. Tell me about yourself.
2. Why do you wish to move out of current job?
3. Explain in detail the current project. Intention was to understand whether I had good depth of knowledge of the project and team I was working in.
4. How big is the team & what is your role?
5. Proudest project that I have worked in my current company. Details.
6. Any instances where you are not satisfied with what you did?
7. Any instances that you felt the need for improvement in some areas, which could have helped you technically and professionally. Any negative feedbacks.
9. Write the code to store Binary Search Tree in Doubly Link list. Code was required.
10. Petrol and distance problem given in Geeks for Geeks. http://www.geeksforgeeks.org/find-a-tour-that-visits-all-stations/

Face to face: Round 5(Manager, 1 hour 10 minutes):
1. Tell me about yourself. It starts with a basic intro round, where your communication skills are judged.
2. Why changing the job?
3. Explain in detail the current project. In depth information.
4. What will you do if your module is dependent on some one else and you are stuck due to him. I told him to that I will create stub (Template of desire data using edge case conditions)
5. Write the full code of finding a Name and phone in simple phone(In which abc all come on 1 using pressing speed and time duration) using sub string of name. I gave 2 solution 1 using suffix tree and 2 using hash table and KMP Algorithm. He told me to write full code of this problem using hash table and KMP Algorithm. I wrote the full and Manager was satisfied with my answer.

Three days later I was informed that I was not selected. With below mail :-

Thanks for your interest in Amazon. We appreciate you sparing time towards discussions with us. After the detailed discussions with you and internal discussions thereafter, we regret that we do not have a suitable opening at present that does justice to your aspirations and capabilities. Hence we would not be able to take it forward at this juncture.

With your permission, we will retain your details in our database and would get in touch with you, should there be a suitable opening in future.

Wish you all the best in your endeavors.

Amazon Interview | Set 22

March 4, 2013

I was recently interviewed for SDE1 position in Amazon Bangalore. 1 online coding test followed by 5 rounds of F2F onsite interviews.

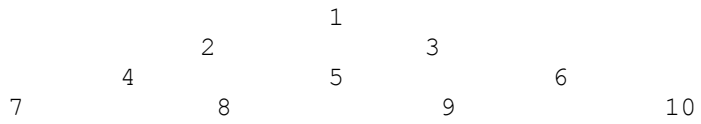
Online Coding Test (4 Problems, 2 hours) From Interviewstreet
All below problems had multiple test cases for which the code was validated against.
1. Code for converting floating point decimal number to binary numbers. If the number cannot be converted, state so.
2. Given an integer array A of size n. Given an integer k < n. Construct an array B, such that B[i] = min{A[i], A[i+1], A[i+2], A[i+3], ……., A[i+k]}
Solve in time complexity better than O(nk).
Hint: use min Heaps
3. A singly liked list. Can have a loop. Detect it and find the size of list.
4. A singly link list and a number 'K', swap the Kth node from the start with the Kth node from the last. Check all the edge cases.
Sample Input: 1->2->3->4->5->6->7->8 and K = 3
Sample Output : 1->2->6->4->5->3->7->8

Sample Input: 1->2->3->4->5->6->7->8 and K = 10
Sample Output: print error "LIST IS OF LESSER SIZE".

Face to face: Round 1(Technical, 1 hour):
1. Given a binary search tree. Find two numbers in the tree whose sum is k. If there are no such elements, state so. Assume that the tree is balanced.
O(n) solution with O(logn) space was expected. Solved using two stacks. Code was required.
2. Copy a linked list with next and random pointer. Not allowed to modify the given list at any time. Only read privilege on the given list.

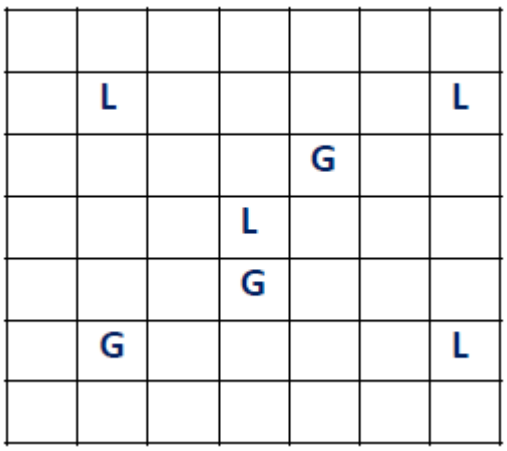
Face to face: Round 2(Technical, 1 hour):
1. Given a matrix mxn containing integers. Find a kxk submatrix which has the largest sum. Solved using prefix sum matrix.
2. Given an n-ary tree. Traverse it in zig-zag manner. Code was required.
Solved using a Queue and a dummy node for level info.

Face to face: Round 3(Technical, 1 hour 20 minutes):
1. Given N buckets each of capacity 1L numbered from 1 to N. Buckets are arranged in a form of a 2D Pyramid shown below.



No each bucket is resting on 2 buckets. I will add water in the top bucket(number 1), after filling the bucket completely access of water will spill to the left and right bucket. Need to write a function which will return water in nth bucket after I will add x L of water in bucket number 1.
float getWaterInBucket(float x, int n);

2. Given an mxn matrix. Each entry is a room. Rooms containing "L" are locked. No one can enter a locked room. Rooms with "G" are guarded rooms. Distance of a room from a Guard is defined as the minimum number of rooms that are encountered for the Guard to reach that room (Guard can move in all allowed 4 directions at max). Find the room that is farthest from all guards. Expected time was O(mn). (Hint: BFS)



Face to face: Round 4(Manager, 1 hour 20 minutes):
1. Tell me about yourself.
2. Why do you wish to move out of current job?
3. Explain in detail the current project. Intention was to understand whether I had good depth of knowledge of the project and team I was working in.(Nearly 30-40 minutes of discussion)
4. How big is the team & what is your role?
5. Proudest project that I have worked in my current company. Details.
6. Any instances where you are not satisfied with what you did?
7. Any instances that you felt the need for improvement in some areas, which could have helped you technically and professionally. Any negative feedbacks.
8. What happens when you type in a URL on browser?
9. Given a binary tree with parent pointer only. Given pointers to two nodes in the tree, find the LCS(Least Common Ancestor). Quality Code was required with proper handling of boundary cases.
10. Object oriented design of 'Snake and Ladder Game'. Was asked to propose classes, inheritance and reasoning behind it.

Face to face: Round 5(Manager, 1 hour 10 minutes):
1. Tell me about yourself. It starts with a basic intro round, where your communication skills are judged.
2. Why changing the job?
3. Explain in detail the current project. In depth information.
4. Given a binary tree. Tell if all the leaves are at the same level. Code was required with proper handling of boundary cases.
5. Discussed how the stock market works. Reached to:
Design a data structure for storing the stock prices of various stocks. Make design such that update (new entry addition) of prices can be done efficiently. Also, it should be efficient to answer the queries like, "Maximum/minimum of stock prices of stocks s1, s2, s3 in the month of November 2012 etc."

Four days later I was informed that I was selected 

Following materials I used for preparation.
1. GeeksforGeeks
2. Careercup
3. Introduction to Algorithms(Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein)
4. Algorithm Design [Jon Kleinberg, Éva Tardos]

Amazon Interview | Set 21

February 21, 2013

Recently I have gone through 10 rounds of interviews of my dream company Amazon for SDE1 and I got selected. My only resource and library for preparation was GeeksforGeeks, which is the best website for tech preparation, if you aim for big shots like Amazon, Microsoft, etc. I was not too confident to attend interviews. The interview experiences blog gave me courage and coding experience to crack all rounds. Please do follow this site for every update, and suggest your friends to follow if they try for job change and if they aim for big companies.

I am sharing my interview experience, which will help others.
Total rounds : 10
1 online written test + 4 telephonic + 5 F2F screening rounds.
In F2F rounds, for every problem complete executable code + algorithm will be expected.
In all rounds , best solution will be expected (with less complexity)

Online Written Test:
1. Find maximum frequent numbers in an array. If there are more numbers with maximum frequency, they display all numbers in ascending order. Ascending order is important.

2. Two numbers represented as linked lists. (Bigger than integers). Return a linked list which is the product of the given two linked lists.
1->2->3->Null (123)
2->3-Null (23)
O/P: 2->8->2->9->Null

1st Phone Screening (45min):
1. Find a linked list has circle in it, If it has loop, find origin of the loop.

2. In Linked list, Node has two pointers, one points to next node, other points to arbitrary node in the linked list. Write a function to return a new list which is clone of the given linked list.

3. An array is sorted and rotated by k times. Find an element in an array. (efficient and logarithmic time solution is expected)

2nd Phone Screening(45min):
1. Two strings s1,s2 are given as input. Remove characters present in s1 which are there in s2.

2. How to find number of subsets in a set.

3. Searching an element in 2D matrix which is sorted in row wise and column wise.
1 2 3 4
2 3 4 5
3 4 5 6

4 5 6 7
5 6 7 8 Find an element in it.

4. Difference between merge sort and quick sort. How do you improve quicksort (think about in selecting pivot element).

5. Give a scenario for quick sort in worst case.

6. How to store a set in memory, what ADTs do we use and what are tradeoffs for each ADT.

3rd Phone Screening(35min):
1. N-Petrol bunk problem: There are n petrol bunks located in a circle. We have a truck which runs 1 km per 1 liter (mileage 1kmpl). Two arrays are given. The distances between petrol bunks are given in one array. Other array contains the no of liters available at each petrol bunk. We have to find the starting point such that if we start at that point , you we would able to visit entire circle without running out of fuel. Initially truck has no fuel.

2. Reverse linked list in groups of size k.
I/P: 1->2->3->4->5->6->7->8->Null k = 3
O/P: 3->2->1->6->5->4->8->7->Null

4th Round(35min):
1. Algorithm to construct a tree given Pre and In order traversals.

2. Inorder successor of a tree.

3. Threaded binary tree(inorder without recursion)

F2F Round 1 (with Hiring manager 60+ min):
1. Tell me about yourself and Projects you worked.

2. About the most critical situation in the project you went through. How you did it. (he needs complete explanation of the scenario)

3. If he gives the same scenario as an interview question, how will you improve code quality and its complexity.

4. About SDLC you followed. Which one do you like and why.

5. Do you have any questions to ask (very important one- ask something about projects they work, etc. Good sign)

F2F Round 2 (with Developer 60 min):
1. Tell me about yourself.

2. Zigzag traversal of binary tree. (more optimal solution is expected from you).Complete code should be written and they will check later.

3. A robot is there in 2D space, which can move to its left direction. You are given with an array which are moves of robot, which starts from origin(0,0). Find the rectangle covered by it.
I/P: { 2,3,4,5,6,1,3,5,5} starts at (0,0)
O/P: rectangle points: (-4,4) to (4,-2)
4. Casual discussion about hiring process.

F2F Round 3 (with Developer 50min):
1. Data structure which does insertion, deleting latest item, find min, find max in O(1) time. (Gave hash, 2-D, linked list, many .. He impressed lot here)

2. Vertical sum of a tree. (Column wise sum – can find same one in geeksforgeeks)

3. Find n-th digit in the continues sorted stream of data.
I/P: {1,2,3,4,5,6,7,8,9,1,0,1,1,1,2,1,3,1,4,1,5,1,6,1,7,1,8…… infinite} n =28
O/P: 28th digit
Complexity analysis of all the above.

F2F Round 4 (with Developer 45 min):
1. Print matrix spirally.
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
O/P: 1 2 3 4 5 10 15 20 25 24 23 22 21 16 11 6 6 8 9 14 19 18 17 12 13 18

2. Write a function to check syntax of opening and closing braces whether they are proper or not.

3. Same question if you have k types of braces(‘(‘ ‘[‘ ‘{‘ ,…. K types) All are of same priority.

4. Same question if you have k types of braces(‘(‘ ‘[‘ ‘{‘ ,…. K types) All are of diff priority.

5. Print all valid combinations of k number of pairs of braces.

6. Return count of above combinations without using algorithm for printing them.

7. Memoziation –do you know about it. Explain me.

F2F Round5 (Bar Raiser round) 60min:
1. Leader ship principles followed by Amazon

2. About project.

3. Why you are leaving prev company, What will stop you there.

4. Set of strings are given in a dictionary order. The problem here is order is not as our alphabetical. It may be different. C may come before a,b, x may come before d,c. etc. You will have to find the order of characters by using given input. (topological sort – complete code is required to write)

5. Binary search tree into Sorted doubly linked list (Expected Inplace algorithm)

Things to keep in mind:
1.For every problem, give one simple solution first (may have more time complexity) and think for optimal solution.

2.Write a code in clear manner. It should be understandable without your explanation.

3.In a position to tell complexity for code you are going to write.

4.First tell the algorithm or approach and proceed with writing code.

5.Do not hesitate to ask for clarification. They will impress.

That's all from my side. Best of luck.

Thanks again for GeeksforGeeks, a lovable website for techies.

Amazon Interview | Set 20

February 18, 2013

Recently got interviewed with amazon Hyderabad for SDE1.

Written
1) Given a BST, along with left and right pointer for a node, it has forward and backward pointers, convert the tree into Doubly linked list using these extra pointers.

2) A = {5, 3, 8, 9, 16}
After one iteration A = {3-5,8-3,9-8,16-9}={-2,5,1,7}
After second iteration A = {5-(-2),1-5,7-1} sum =7+(-4)+6=9
Given an array, return sum after n iterations

3) Write a function which compress string AAACCCBBD to A3C3B2D
and other function to generate from the compressed.

First f2f)
1) Check given BT is BST

2) The cost of a stock on each day is given in an array, find the max profit that you can make by buying and selling in those days

3) In matrix A[m][n] each row is sorted and each column is sorted, write a function which checks whether a number exists in this matrix or not.

4) Given a string, find the longest sub sequence which contains only unique characters.

Second -f2f)
1) Convert a BT into SUM BT(each node values = sum of left and right node)

2) "I get thousands of emails daily", find all anagrams in each email and print the count of all anagrams in each email.
My solution was using a trie and a hash function to increase the counter at each node in the trie.
Hash function will return the given word in a sorted manner, he asked me to code which was tedious but gave a rough draft.
Initial set up cost would be big but the same trie can be used for any email by making all counters to zero.

Third f2f)
1) He talked almost for 45 min regarding my project and asked how we implement it. I was also working on web services in my current company, so they were more interested in asking questions there and want to know how well I implemented there.

2) A design question of chess int board[8][8] each value in the matrix represents a character.
1-9 number represents all whites and 11-19 represents all blacks.
Given a pawn at (x,y) print all possible moves. Assume whites are index 0 and blacks are at index 7.

Fourth f2f)
1) There is ternary tree in two dimension space(one plane). Print all elements that are visible from right side of the plane(If you see along y axis plane)
eg) In the following answer would be (1) (5) (8)
————————————(1)————————————
————————-(2)–(3)–(4)–(5)————————————
————-(6)–(7)–(8)————————————

2) Print these elements in a zig zag order, first level1 and then level n, level 2 and level n-1 and so on.

In simpler words print rightmost ending element in each level of a ternary tree.
My approach was take two queues, enqueue root in Q1 and while dequeueing enqueue its childeren in Q2, while shuffling elements from one queue to another store the last element in doubly linked list.
While printing, use this double linked list, remove from head and then tail, till it becomes empty.

Fifth f2f)
1) Find jth element in ith row of a pascal triangle

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1… and son on. pascal(4,2) should return 6.

```
pascal(int i , int j){
  if(i<0||j<0) return 0;
  if(i==0 &&j==0) return 1;
  if(i==0 && j!=0) return 0;
  return pascal(i-1,j-1)+pascal(i-1,j);
}
```

complexity is bad and I am not grouping the solution once calculated of sub problems

2) Implement your own hash function with keys as strings and values is of type Object initially I told BST with insertion deletion of order log(n), then he told me to think and answer then I told self balancing BST and he asked me to implement,

3) Evaluate a mathematical expression 2*3+(5-6/2), something like this, with operator priority.

Each f2f interview will be of 50-60 min. In each f2f round they will ask reason for change, and about your current project. You should answer perfectly regarding your current project and don't blabber something and all, they will ask good questions in the current project as well.

These questions might take up more than 15-20 min and in the rest of the time you have to answer 2 question in DS for minimum and code them as well.
If you answer you will get one more question which is an advantage
First he will explain the question and gives you sometime.
You need to explain the solution first, if he likes it, then he will asks you to write production code and takes the paper.

Each interview is not like a level in amazon, they won't share feedback neither with you nor with other interviewers.

After the interview process is done all those who took your interview will sit and judge (That's what HR told me)

All the interviewers were friendly, finally I got a call from HR saying that I was selected

Thanks to Geek4Geeks

Amazon Interview | Set 19

January 25, 2013

I recently had a set of interviews with Amazon.com and listing below the questions. The day had around 15-20 of us at their office and the whole process took close to 12 hrs.

Hope, people can reap benefit from it.

1st Round: Online Written round.
a. Determine if a matrix is a cross-matrix.
A cross-matrix is a one in which all the diagonal elements are same and not repeated anywhere else.
b. Print the level-order in reverse order, i.e. from Bottom to top.
c. One more easy question, which I don't remember now.

2nd Round: F2F- Developer
a. Kadane's Algo.
However, it was hidden behind a good problem set.
Interviewer wanted to identify whether I can recognize the same.
I did not remember it instantly but was able to prove it by solving.

b. Linked-list intersection point.
Again, had to decipher the above from a different problem set.
[A tree with only parent pointer, how to find LCA?]
Was able to easily identify the same and we quickly moved onto other things.

3rd Round : Hiring Manager
a. Design a stack which can perform findMax in O(1).
Had read the answer once in some book and duly told him have heard it.
He verified and we moved on.
b. Set of stocks for each day have been given. Need to find the days on which I buy and sell share to earn max profit, alongwith finding the max profit.
Had to write the code, which I was able to do well.
He was impressed and I felt I had a good chance.

4th Round : Developer
a. Find top k searched elements from a continuous stream of data.
I remember we needed to use Min Heap but his constraint was using a continuous stream.
Finally was able to do it with his help.
b. Some design question based upon his team's problems.
Had to use a queue and a hashmap to solve it.
He was very much interested in whether I could identify the complexities correctly.

5th Round : Manager – Different Team
a. Given a linked-list and 2 integers k & m. Reverse the linked-list till k elements and then traverse till m elements and repeat.
Write production quality code.
I am not sure what happened and why I fell off on such an easy question, but you just can do something like that in the last round.
b. An array of elements have been given. Find for each element, first max element to its right.
Was able to do it well, however lost it on complexity analysis.
c. Boundary traversal of a tree. Write the code.
Wrote the code, however he was not able to check the same as took a lot of time.

Amazon Interview | Set 18

January 22, 2013

Amazon visited our campus on 16,17 and 18 Dec.

WRITTEN ROUND(1.5 hrs)

20 MCQ + 2 CODE
MCQ- mainly Aptitude, C-output questions, OS- unix related and DBMS

CODE-
…1) Binary complement of a number.
…2) Easy question related to bets

42 out of around 200 students were shortlisted after this round..

ROUND 1:
Around 15 min discussion on my image processing project

Finding an element in rotated sorted array..

12 students were shortlisted after this round

ROUND 2:
1) Convert postfix to infix in which the result must be having minimum number of braces i.e apply braces whenever necessary.
2) Given a binary tree print the sum of elements on same axis (for all axis).
Elements on same axis are for e.g.: root, root->right->left, root->left->right
3) Design hash table with following operations you are given with a good hashing function..:
insert() –O(1)
find()-O(1)
delete()-O(1)
traverse()-O(n)..(where n is the number of elements in hash not the size of hash)
4) Given an array find a sub-array with sum=0
5)

```
for(i=0;i<n;i++)
 for(j=0;j<n;j++)
   cout<<a[i][j];

for(i=0;i<n;i++)
  for(j=0;j<n;j++)
   cout<<a[i][j];
```

out of these 2 which one will be better
I was asked to write the complete code for all the questions.

6 students were shortlisted after this round

ROUND 3:
1) Given memory in the form of chunks if one process is reading any chunk, then any other process is not allowed to write but it can read, if write lock is on, then any other process is not allowed to read or write, now process can have lock on any number of chunks (continues) and other process requesting read or write can even request for memory that does not have the same starting address as the process who has locked the continues chunk memory.

Now we have to design a DS for representing memory and then design isRead() and isWrite()which will return Boolean values true-if read/write can be performed vice versa.
2) Permutation of a string with and without repetition of characters.
3) Given an array of numbers if we start deleting numbers from end of array, then we have to tell the maximum element of the array after deletion in O(1).
I was asked to code all the questions.

4 students were shortlisted after this round.

ROUND 4:
1) Around half hour discussion on my intern project which was with an e-commerce company.
2) Given a linked list with one extra arbit pointer we I was asked to make copy of linked list..

http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/

he asked me to write the full code for method 1 in the above link.

In the end 3 students were hired and I was one of them..

I am very thankful to geeksforgeeks It really helped me a lot for my preparation. Keep up the good work guys

Amazon Interview | Set 17

January 15, 2013

Online Written round :
5 programming questions. You have to answer within 2 hours.
1. Swap two nodes in a linked list
2. Find kth smallest element in a binary search tree
3. Longest increasing subsequence in an array
4. One DP program

Face to face interviews:

1st round :
1. Find whether given tree is BST or not
2. Boundary traversal of a tree
3. Print the border nodes of the tree

2nd round:
1. There are n number of points in a two dimensional plane. Find two nearest points
2. There are n number of points in a two dimensional plane . Given a point find k nearest points to it.

3rd round:
1. Given a matrix with random numbers in it , If a location has 1, make all the elements of that row and column as 1
2. Given a matrix, find whether you can form the given number in

4th round:
1. Write a program to list all the possible words from the given set of data in the same order. (eg : given word : nokiamobile O/P : nokia mobile : given word : samsung O/P : 1. SAMSUNG 2.SAM SUNG(considering sam as a word))
2. Given two trees , find whether they are from same set of dataset or not.
3. Thread pool implementation.

Amazon Interview | Set 16

December 18, 2012

I recently appeared for amazon which came to our campus. Here is my experience.

Shortlisting Round.
There were 20 MCQ and 2 programming questions. Each correct answer carried 1 mark and -0.25 for a wrong answer. Programming questions were:

a. Given a number with the number of digits in the range of 10-50, find the next higher permutation of the number. If such a number doesn't exist, return -1.

b. Given an array of strings, you need to find the longest running sequence of a character among all possible permutations of the strings in the array.
INPUT:
ab
ba
aac
OUTPUT:
a,3

Then there were 4 rounds of interview.

T1
a. Given link list segregate odd elements first and even elements afterwards.

b. Given a BST of memory sizes. Find best fit for a memory block of size M.

T2.
a. Given 2 sorted arrays of size m and n+m(with n elements) , merge
them into the latter..
b. Given a character array find the first element that repeats itself.

T3.
a. Given a binary tree connect all nodes in a level through link list.

b. Some question related to share market which boiled down to find maximum difference between two elements such that second element appears after the first one.

c. What is thrashing ?

d. Real world application of heaps?

e. Minimum spanning tree and topological sort .

T4.
Around half an hour HR then
Given a function node* inplacemergesort(node* n1, node* n2) which takes 2 linked lists as input and performs in-place merge sort and returns the final list. How will you test it and make sure it does what it claims.

I was hired .
The interviewers were very friendly, patient and looked for optimal solution to each question .

I am very thankful to geeksforgeeks for such a great site and the way its maintained.It really helped me a lot for my preparation. Keep up the good work guys

Thanks.

Amazon Interview | Set 15

December 18, 2012

For the position SDE I.

I had an online test through interviewstreet and following were the questions:
http://www.geeksforgeeks.org/archives/9999

http://www.geeksforgeeks.org/archives/8615

http://geeksforgeeks.org/forum/topic/microsoft-interview-question-for-software-engineerdeveloper-about-arrays-10

http://www.geeksforgeeks.org/archives/1155

F2F Interview :
1. Generate all valid permutations using '(' and ')'. Valid permutation is the general definition of valid sequence of the opening and closing brackets.

I told him a solution where we would generate a combination using a recursive solution and prune the cases where a valid combination is no longer possible. The solution was fine and not that difficult. But the interviewer was very interested in knowing if I can calculate the complexity of the solution. He gave me some hints but it was just not striking me. I told him my approximate answer. We moved on.

2. Create an ancestor matrix for a tree.

The solution would seem simple. But since the matrix is N*N, the interviewer wanted some tricks to reduce the complexity of the write operation on the matrix.

I told him a solution where you can initialize the matrix with all zeros and only write 1 for the ancestor cell using a modifies recursive solution and linkedlist.
He was fine with the solution

F2F 2:

1. Find the maximum weight node in a tree if each node is the sum of the weights all the nodes under it. Obviously tree nodes can have negative weights.

2. Kadane's algo

F2F 3:

1. Find the diameter of a tree.

2. Link every node of a level to the the next node at the same level

```
eg:
Tree is:
                    1
                2       3
            4     5  6     7
would become:
                    1
```

```
        2-->3
4--->5--->6--->7
```

3. Find the first subarray which has a zero sum in an array

F2F 4:
Detailed discussion on projects I did in college and about my interests.

Amazon Interview | Set 14

December 17, 2012

Team : Transportation
Location :Hyderabad

Round 1 (Online Test)
Q1. Find the kth largest value in a BST

Q2. Swap the alternate nodes in a singly linked list(not the data);

Q3. Minimum no of coins required to get the given sum. Coins are given in a sorted array.

Q4. A file contains data as follows(Student name, marks in 3 subjects)

Shrikanth 20 50 60

Kiran 30 80 90

Find the student who has maximum average score

Q5. Find out given two trees are isomorphic or not

Round 2 (Telephonic Round)

Q1. Print the level order of binary tree such that each level should print in a different line

Q2. Push() and Pop() methods of stack are given. Write a function to get the minimum of stack in O(1) time

Project related questions

Round 3 (F2F with Dev Manager)

Q1. Connect nodes at same level in a binary tree(may not be a complete binary tree) without using recursion

Q2. Sort the linked list which contains only 1,2,3 numbers in a single pass

Round 4 (F2F with developers)

Q1. Design a snake and ladder game

Q2. Given a linked list contains even and odd numbers. separate the list into two lists contains odd/even numbers.

Q3. Given a 2D matrix which contains 0′s and 1′s. Given two points of matrix whose value is 1. Find the path(with only 1′s) between the given points

Round 5 (F2F with Senior Manager)

Project related questions

Challenging tasks done so far

Q1. Given a large file which contains m rows and n columns. Given a column no, sort the column in such a way that corresponding rows also sorted

Round 6 (F2F with Developers)

Q1. Print all pairs(sets) of prime numbers (p,q) such that p*q <= n, where n is given number

Q2. Given a binary tree, if parent is 0, then left child is 0 and right child is 1. if parent is 1, then left child is 1 and right child is 0. Root of the tree is 0. Find the kth node value which is present at Nth level

Q3. Longest monotonically increasing sequence in O(NlogN)

I couldn’t make it. Hope it helps someone else.

Amazon Interview | Set 13

December 12, 2012

Round 1 (Telephonic)
Q1. For a given number, find the next greatest number which is just greater than previous one and made up of same digits.

Q2. Find immediate ancestor of a given Node

Q3. Clone the linked list having an extra random pointer in nodes which is pointing random node in the list.

Round 2 (F2F)
Q1 In a binary tree, a random pointer is given in each node. If this pointer pointing other than any successor of the node then set it as NULL. Otherwise let it remain untouched. Write code.

Q2. You will be given the number of pairs of parenthesis. Find out the total possible valid unique combinations and there should not be any duplicity. Write code

Round 3 (F2F)
Project and some questions related to it.
Q1 Given an in-order traversal of a special binary tree having property that the node is always greater than its left and right child. Construct the tree and write code.

Q2 Find top 10 trending words inserted by users in sites like twitter. Only algorithm.

Q3 write an efficient code to find the first occurrence of 1 in a sorted binary array. (2 minutes only)

Round 4 (Telephonic)
Q1. Remove duplicated from a string in O(n) without using hash.

Q2. Find the first occurrence of 1 in a sorted infinite binary tree.

Round 5 (F2F)
Amazon has many visitors to its site. And it tracks what pages the customers visited, etc and other stuff.
Make an efficient data structure for storing 3 days of information of all those customers who have visited site exactly two different days and searched more than 3 unique pages of the site in those 2 days.

So whoever visited site exactly two days out of these three days and visited more then 3 unique pages should be in the contact list.

After final round got a regret mail after 3 days that I was Not selected.

Amazon Interview | Set 12

December 4, 2012

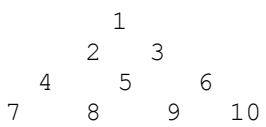
I am very thankful to geeksforgeeks team for such a great site. I got offer from Amazon.

Written Test
It was online test on interviewstreet.
20 MCQs- basics of C & C++, OS and some aptitude question

There were 4 technical rounds each for 40-60 minutes, no HR round.
1st Round
Given two numbers and a binary tree, all elements in binary tree are distinct, write code to determine the shortest distance between the two nodes. (unit distance between two adjacent nodes). Nodes don't have parent pointer.

2nd Round
1. http://www.geeksforgeeks.org/archives/3758

2. There are some glasses with equal volume 1 litre. The glasses kept as follows



You can put water to only top glass. If you put more than 1 litre water to 1st glass, water overflow and fill equally both 2nd and 3rd glass. Glass 5 will get water from both 2nd glass and 3rd glass and so on..
If you have X litre of water and you put that water in top glass, so tell me how much water contained by jth glass in ith row.
Example. If you will put 2 litre on top.
1st – 1 litre

2nd – 1/2 litre
3rd - 1/2 litre

3rd Round
1. http://www.geeksforgeeks.org/archives/3042

2. Liked list is given as below (with elements as 1, 2 and 3), sort this in one pass.
3->2->2->1->2->3->1

4th Round
1. An expression is given.
[] can enclosed [], {} and ()
{} can enclosed {}, ()
() can enclosed only ()
Check that brackets in the expression are valid or not according to enclosing condition and opening closing condition.
Follow UP:
Two arrays are given.
One array contains symbols and second one contains expressions. Symbol array contains opening symbol at even index and closing symbols at odd index just after opening symbol. Index is starting from 0. Opening symbol at index i can only contain symbols from i to 2n-1, If there n pairs of symbols.
Now check that expression in the expression array is valid or not.

2. There are m sorted arrays of each size n. You have another array B of size m*n. Fill the array B from the m arrays in sorted order.Give the optimal solution.

I liked the way interviewers were interacting. They were very supportive and friendly as well.

Amazon Interview | Set 11

November 25, 2012

I would like to thank geeksforgeeks team for the excellent website. I got placed in amazon because of your website. I would like to share my experience and the interview questions.

1 round was online written technical test
There were 20 MCQ and 2 programming questions. Each correct answer carried 1 mark and -0.25 for a wrong answer. Programming questions were:

—Write a program to find the difference between the sum of nodes at odd height and the sum of nodes at even height

—Given an array of integers representing coin values and the sum required. find the number of coins required to get the sum

4 technical rounds
Various programming questions related to data structures were asked. Each round was an elimination round. Questions asked were

—Write a program to traverse the tree in spiral form in O(n) time.(Hint:use two stacks)

—Program to implement atoi function

—Program to swap the kth node from end and kth node from front

—Program to find loops in linked list

—Find the maximum length palindrome in a string

—Difference between process and thread

—Advantages and disadvantages of thread and process

—Test cases for checking binary tree

—Test case for atoi function

—Test cases for finding loops in the single linked list

Each technical round was for 60-90 minute duration. There was no HR round

Amazon Interview | Set 10

November 16, 2012
Recently I got interviewed at Amazon Hyderabad. I just wanted to share my experience. Hope someone gets little help from this.

1. Telephonic

a. In Binary Tree node, extra pointer ->next is given in the structure of node. Make linked list at each level.

I did it with using Queue made of doubly linked list. Time complexity O(n), space O(n). I was asked to write code as well on collabedit site.

b. Equilibrium point in array, equiPoint = ith index where Sum(Left array) = Sum(right Array).

Did it O(n) time complextity and O(1) space. I was asked to code it as well.

2. Telephoinc

a. Find each pair in BST, which adds up to given number k.

Explained different methods for it and he asked me to code for one.

I did it as follow.

```
void findPairs(node *start, int k)
{
      if(start == NULL)
         return;
      findPair(start->left, k);
      if(k – start->data > start->data)
      {
          if(search(start->right, k – start->data)) // this search is normal BST search.
              printf("(%d, %d), ", start->data, k – start->data);
          findpair(start->right, k);
      }
 }
```

b. There were few other simple questions. I don't remember know.

1. Onsite: with Hiring Manager.

a. About Project, cross questioning, etc.

b. Two files containing large number, one in each. You have only fopen(), int read(fp), fclose(), fwrite(). Add these two numbers and write in third file with the help of given functions only.

Explained him the logic and he was okay with it.

c. Write sql query for getting direct and indirect reportees of a given employee. Lets say Employee table(empId, ManagerId).

wrote it and he verified it and it was okay. Recursive query, CTE.

d. Oops concepts, asked to explain Static keyword with all possible example.

Explained, variable, methods, classes one by one with Static keyword.

2. Onsite: with Developer.

a. Print encoding for an Array.

Rules: consider BST made from given array. Let say number x is present in the BST and to reach x, If you go right print 1, if left then 0.

Now you are given an index i in the array A (so x = A[i]) and print the encoding without constructing BST to reach x

and without space with least time complexity.

I was not able to do it on the spot but after this interview, I got some free time and solved it and handed over papers to the interviewers. I liked this problem. It was little interesting.

b. Find triplets in array so that a+b+c = k, k is given number along with array.

c. Then moved to finding all possible pair set in an array. Mind the term SET. Take care of duplicates as well.

Reduce time complexity as much as you can.

3. Onsite: with Developer.

a. Given array, find all possible sets of elements which add up to a given integer K.

I coded it with just 4-5 lines in just couple of secs. It took little time to make him understand the solution.

I was given an input of 6 numbers in an array and asked to run my solution till the end. It was recursive and he asked me to keep on writing, writing, writing, till he got that okay, it will work fine.

b. I was asked couple of questions which I already knew and I told him and we moved on to next questions. I don't remember what he asked.

c. If tree is BST or not. Coded it.

4. Onsite: with One Manager and Senior SE.

a. Discussion on my current Project. Quite a good discussion. It took quite a good time.

They asked me what more enhancements I can think of for features, I made in my project.

I explained few different things that I could think on the spot and they liked it.

b. Linked list with a "mad" pointer along with "next" pointer in it, mad can point any where(can be null as well). Return clone of given such linked list.

I already knew the best approach for this. Then he asked me to think something else. I mentioned Hash. He was okay with it and we moved on.

c. Replace the elements in an array with the next following greater number of it from right side of the element.

I told him I already know this and I asked if he wants me to explain the algo. He said so and I explained. Then we moved on.

d. Reverse each K nodes in linked list.

e.g. 1->2->3->4->5->6->7-_ given

output 3->2->1->6->5->4->7-_

e. Two strings S and S1. Remove all chars from S which are present in S1.

Explained them all possible methods for this what I could think of(with space, without space). Finally, they were looking for BitMap solution. I explained that as well before one mentioned it.

f. Design a Chess game.
Gave different classes and their relations, some procedures, then cross questioning and I was able to give all answers which he mentioned quite reasonable.
They were okay with the design.

In the whole interview process I was asked like 8-10 questions which I already knew and I mentioned the interviewers same. I was told why you read so much.

Overall, it was quite a good experience for me. I liked the way interviewers were interacting. They were very supportive and friendly as well.
Unfortunately, I was not selected. I have no idea what they were looking for.

Amazon Interview | Set 9

November 14, 2012

How did it start?

I completed and submitted the 4 programs at the link:
https://amazon.interviewstreet.com/challenges/dashboard/#problems

Later on I came to know that the recruitment through this link is over. So I contacted a few of HR persons at Amazon, and I got a new link for online programming test.

Online Programming Round: (5 methods, 2 hours)

1) A sentence is given which contains lowercase English letters and spaces. It may contain multiple spaces. Get first letter of every word and return the result as a string. The result should not contain any space. Complete the following method:

static String getFirstLetterWord(String text) { }

2) Given an array. Iterate it for the given number of times. And then return the summation of the resultant elements.

Ex: Array is { 1,2,5,6}, N=2

After 1st iteration: {2-1, 5-2, 6-5}={1,3,1}

After 2nd : {3-1, 1-3}={2,-2}

Sum is 2 + (-2) = 0

If only one element remains in the array, the element remains the same after applying the iteration. Complete the method.

static int iterateSequence(Vector<Integer> a, int N) { }

3) Find Nth largest element in the BST. Complete the method.

staticintnLargeBST(Node root, int N) {}

Given that

```
class Node
{
    Node left, right;
    int data;
    Node(intnewData)
    {
        left = right = null;
        data = newData;
    }
}
```

4) Swap adjacent nodes in the linked list. Change the links, not the data. Complete the method.

Ex:1, 2, 3, 4

o/P: 2, 1, 4, 3

ex: 1,2,3,4,5

op: 2, 1, 4, 3, 5

```
class Node {
  Node next;
  int val;
}

static Node swapAdjacentNodes(Node head) {}
```

5) Find length of the Longest-Increasing-Subsequence.

e.g.1.
i/p: 1, 2, 3
o/p: 3
explanation: the sequence is increasing

e.g.2
i/p: 4,5,6,7,8,1,2,1,2,3,5,4,6,7,8,9,0,6,7
o/p: 8
xp: 1,2,3,4,6,7,8,9

e.g.3
i/p: 1,2,9,4,5,10,7,8
o/p: 6
xp: 1,2,4,5,7,8

e.g.4
i/p: 20, 3,22, 5,50, 34, 49, 91,110
o/p:6
xp: 20,22,34,49,91,110
OR
3,5,34,49,91,110

Complete the method.

static int lengthLIS(Vector<Integer> sequence) {}

Telephonic Interview 1:

1) A M x N matrix, filled with 0s and followed by 1s. Find the row which contains minimum number of 0s. E.g.

0 0000 1

0 0 1 111

0 00 1 11

The answer is 2nd row. (Row index: 1)

2) Find whether given two strings are anagrams of each other.

3) Given an array of size N, move the first d elements to its last.

e.g. {1, 2, 3, 4, 5}, d=2

- output: {3, 4, 5, 1, 2}

Telephonic Interview 2:

1) Given a BST, find the node which contains the value which is equal to (or lowest greater than) the input value.

2) Kadane's algorithm for 1 dimensional array.

3) Given a point P and other N points in two dimensional space, find K points out of the N points which are nearer to P.

Face-to-face Interview 1: (Hyderabad, Date: November 08, 2012)

1) Given a Singly Linked List which contains integers, bring odd values in the beginning and even values at the end. The relative order of odd values, and that of even values should be maintained as it is.

e.g. 34, 45, 78, 10, 33, 5

- o/p: 45, 33, 5, 34, 78, 10

2) Given N sets of integers, remove some sets so that the remaining all sets are disjoint with one another. Find the optimal solution so that the number of sets remaining at the end is maximum.

Face-to-face Interview 2 (with a manager):

1) Given an array of size N, a window of size W slides over it by increment of slide S. If the window reaches to the end, we should stop there. Find a formula in form of N, S, W so that we can find the number of valid windows. Write a program to find minimum in every window and print it. Optimize it.

e.g. {1,2,3,4,5}, W=2, S=1
first window: {1,2} min=1
second window(increment by S=1): {2,3}, min=2

…

last window: {4,5}, min=4
The array might not be sorted. I have taken sorted array for simplicity.

Face-to-face Interview 3:

1) Trim the Given BST by given min and max values. It means remove the nodes which have values less than min or greater than max. Write iterative and recursive – both the solutions.

2) Given an array of strings, find the string which is made up of maximum number of other strings contained in the same array.

e.g. “rat”, ”cat”, “abc”, “xyz”, “abcxyz”, “ratcatabc”, “xyzcatratabc”
Answer: “xyzcatratabc”
“abcxyz” contains 2 other strings,
“ratcatabc” contains 3 other strings,
“xyzcatratabc” contains 4 other strings

3) Find integer value of sqrt(N). Do not use any library functions or any mathematical solution.

Face-to-face Interview 4 (with the manager of the unit of opening):

1) Given a 2-dimensional array of integers, find the value 1 in the array, and set all those rows, and columns to 1, which contains one of the values as 1.

2) Suppose you are working in companies like naukri.com. You need to collect email Ids and contact numbers of all the Software Engineers aged between 25 to 40, in India. How will you do that?

3) Suppose a person of the age of your grandfather works on computer. He knows little about the computer. And he complains that it was working fine, but for last 2 days, it has become very slow. How will you solve it? What could be the reasons?

4) Design an IVR system for a Restaurant in which customers can book their tables for lunch and/or dinner. Advance booking for 2 or 7 days/as you wish. After the request from user, respond to him that you will confirm the request within 5 minutes. Check availability and send SMS confirming the same. If the SMS is delivered then assume that the customer is genuine. If the SMS is not delivered properly, discard the user request, as it is not genuine.
i) How can you take names and email Ids of the customers during the process?
ii) What can you do for repeat customers? How will you identify the repeat customers?
iii) If there is request for a team size greater than the table size, what will you do? E.g. request for 10 persons when table sizes are 6, 4 and 2.

All the Best!

Amazon Interview | Set 8

November 2, 2012

I recently interviewed with amazon for the position of SDE1 in their TRMS team. The interview procedure was unimaginable rigorous.

Here are the details

Round 0: Written Round

Interviewstreet Test – 2 questions to be done in 2 hours

Q1: Calculate the expression (2+3)*5 .. The question just said this .. I guess we had to make our own assumptions to solve the problem

Q2: Two trees can be called isomorphic if they have similar structure and the only difference amongst them can be is, that their child nodes may or may not be swaped..

for example

——4

—-2—6

–1–3–5–7

and

——4

—-6—2

–1–3–7–5

are isomorphic .. the trees are similar and a few nodes have their left and right child swapped…

Given two trees determine if they are isomorphic…

The interviewstreet people marked the solution to my first question wrong even when it worked fine.. When I told the HR about the situation, she got it checked with some of the amazon guys and they were ok with it.

I cleared the written test.

Telephonic Interview 1

Q1: Find the Kth largest integer in a Binary Search Tree. When I told her the solution like the one given on geeks for geeks, she asked me to do it using recursion.

Q2: Given an array of positive integers, find the max no that can be formed by any permutation of the arrangement. I told her a logic. She then asked me to write just the comparison function to choose one number to put before the other.

When I gave the interviewer straight answers, she twisted the question more.. Probably they wanted to see how i think and approach a problem.

Telephonic Interview 2

Q1: A binary search tree is given with its two nodes interchanged. I had to find both the nodes.

Q2: Identify all the pythagorian triplets in the given array.

I cleared this round. The HR told me I had to come over to Bangalore for in-person interviews. (all the travel arrangements were made by amazon itself)

Personal Interview 1

Q1: Find the sum of continuous subarray within a one-dimensional array of numbers which has the largest sum .. I didnt know a solution (kadane's algorithm), but somehow I was able to work it out in the interviews ..the interviewer liked my way of approaching and did help a little

Q2: How can you best implement queues using stacks. What would be the time complexity?

was able to do this one quickly.

Personal Interview 2

Q1: Find non-unique characters in a given string. I told her one O(n^2) [brute force], one O(n logn) [sort and then compare adjacent elements], and one O(n) [store the character count in an array] approach. She then asked me to do it in O(n) without using array.

Clueless, she finally told me she wanted me to use BIT Vector. I wasnt well converse with Bit Vectors and I told her so.. She still asked me think more. Finally she told me a solution using the same which was impossible to think in the interview alone, especially when one didnt know what BIT Vectors were. She agreed when I stated the point and accepted my previous O(n) solution and we proceeded to the next question.

Q2: Given an array of integers, populate another array with the product of the elements of the first array except for the current index element.

Here when I gave her a O(n) solution [find product and divide it with current element to get the number for this index position], she asked me to do it without the divide operator. Gave her a O(n^2) solution. But I couldn't think better. Finally just when she began to tell me an O(n) approach, I remembered the geeksforgeeks solution to the problem and gave it to her. Probably she didn't consider it. (don't know for sure)

Personal Interview 3

This interview was with the hiring manager at Amazon. He first asked me a couple of HR questions like Why Amazon? Why should we hire you? Projects, internships etc ..? How would you handle a disagreement with your team mates? Etcetc …

Then he asked me a programming question.

Q: He drew a circle on the board and marked a few points on it. Named them X1, X2, X3 ..

Then he said these are gas stations, and you have to find the correct gas station from where a car should begin to loop in the circle such that it never runs out of gas before completing a round. He then sat on the table.

(Sorry, but I will have to describe it in detail to tell you how it was put out to me.. and off-course to bring in more clarity to the question itself..)

Unclear about what I had to do exactly and what information was available, I asked him back a few questions.

Why will car run out of gas after fuelling from lets say the first gas station?

He said each gas station has limited amount of gas (lets say X1) and after fueling from this station it can run out of gas even before reaching the next station (anything could happen, it may be able to cross the next gas station but run out later before completing the round..). So I have to find a gas station the car should start the loop from such that it never runs out of gas before completing the loop.

So can the car refuel at the next available gas station, if its able to make up to it?

Yes

Do we have the information about the amount of gas required to reach from one petrol pump to another?

Yes

I made an assumption that the car tank was huge enough to fill as much gas as possible.

And then I drew two arrays, one holding the amount of gas each station had, and other the amount of gas needed to go from this station to the next station..

Fuel Available: X1, X2, X3, X4, X5

Fuel Required to reach next station: Y1, Y2, Y3, Y4, Y5

He said ok, and asked me to go ahead.

I then took the difference (Y1-X1), (Y2-X2) ..and stored it in an array.. and then suddenly it hit me that this became a simple problem of finding the maximum sum of a continuous subarray within an array (circular). He liked my approach and asked me to program it. Did it and showed him a dry run of the code I had written. He was ok with it.

(I felt good after the interview because in there I didn't stumble at all ..)

Personal Interview 4

Q1: We have a huge file with braces '()' [just one type..] Find if they are balanced .. (stacks wouldn't work here because you will probably run out of memory storing the stack ..) When I gave him another solution, he asked me to do it using parallel processes. I told him to

elaborate more.. (to be honest I wasn't familiar with parallel processes) .. Finally I told him so ..and he asked me to think about it still ..

We discussed it for about 20 minutes. Not reaching anywhere he moved on to ask me the next question.

Q2: Find the smallest substring which contains all the characters of the main string. Again I dint have a solution to this. I gave him a O(n^2) approach. He asked me to think further because the way I was approaching it was the way to go about it and I can make use of the last sub-solution obtained to improve my complexity. Couldn't think of anything, we finally moved on to the third question.

Q3: given the numerator and denominator of a fraction, find the quotient and the remainder without using divide and mod ('/', '%')operators. This was simple. I did it. He then asked to write the invariant of my solution which was denominator*quotient + remainder = numerator.

He then asked me to think about the cases when either or both of numerator and denominator were negative. We were almost out of time so he didn't give me time to think and concluded the interview. He wanted me write an invariant that was true regardless of the input. Now that I think of it, I should have said |denominator|*quotient + remainder = |numerator|

Flew back home in the night.

2 Days later the HR informed me that I didn't make it in. 

Amazon Interview | Set 7

September 18, 2012

Hi my name is Anandhakumar. P. I am a 2012 pass out from college of engineering guindy. I recently underwent offcampus interview with Amazon, Chennai, India for the post of SDE. I love geeksforgeeks and i will call it as the best site to prepare for coding interviews. Here goes my interview experience. Hope this is useful to someone and someone gets benefitted by it.

Written test [1 hr 15 min duration]
Three questions were asked.

1) Check whether a tree is balanced.

2) Reverse k nodes in a linked list.
eg 1->2->3->4->5->6->7->8->9->10->11 [k=3]
answer must be [3->2->1->6->5->4->9->8->7->11->10]

3) arr1 – 4, 5, 6, _, _, _
arr2 – 1, 2, 3
arr1 has enough free space to hold elements of arr2. Merge array 2 with arr1 in a sorted manner.
Cleared this round. I felt it easy as i was preparing for it for more than 2 months and geeksforgeeks helped me greatly.

1st face-to-face interview [1 hr 15 min]
Short description about myself
[2 min alone. Just told my name and my most important project for which i won ipad 2]

1) An array of size n is given. The array contains digits from 0 to 9. I had to generate the maximum number using the digits in the array such that it is divisible by 2, 3 and 5
eg: 1 array = 18760, output must be: 8160
eg: 2 array = 7776, output must be: "no number can be formed"
[discussion went for more than 35 minutes. Every time i gave a solution, he was adding the constraints and finally i did it. he was ok with it.]

2) least common ancestor in a binary tree [Note : not binary search tree] [30+ minutes]
I explained him with several methods and finally he was ok with and asked me to write the code for and i did it. he checked my code for different test cases and finally he was ok with it ..

Not even 5 minutes break i was asked to get ready for next face to face interview .

2nd face to face interview [1 hr 20 min]
Short description about myself [2 min alone. just told mmy name and my most important project for which i won ipad 2. dont tell too much. they just wanted to know a little about u . inshort ur name and college.]

1) zig zag traversal of a binary tree. [35+ min].
Man i have studied this in geeksforgeeks and wrote him the code using recursion, which was working perfectly. But he told me to use reduce the complexity by using any data structures. I told him a logic using a stack and a queue. Another logic using 2 stacks . But he wanted me to use only one data structures. I tried using a single queue and he to helped me a little and finally he was ok with it .

2) A n*n matrix is given which is containing elements in which each row alone is sorted. column is not sorted. I have to convert it into a single dimensional array which will hold all the elements of the array in a sorted manner.
I told him many logics . actually he kept on adding constraints with whatever logic i told him. Finally he gave me a hint and asked to use minheap property and finally he was ok with it. I solved this question using lots of help with him. man i was in interview for continuously more than 3 hours.

I am waiting for my result for next round. I will update if i go through the next rounds. Overall it was a great experience with amazon and people in amazon are very smart minded.

Hope this is helpful to someone!

Amazon Interview | Set 6

September 16, 2012

Following are my interview details for senior software engineer in 2010. Thought of sharing it, if it helps anybody

Telephonic Interview 1
1) Write your own power function in C/C++. Time complexity of your code, optimizations.
2) Given two strings, write a function to remove all characters in one string which are present in other string

Telephonic Interview 2
1) Construct a tree from ancestor matrix. The main thing he wanted to check was use of binary search.
2) Find the k maximum selling items at amazon site at the end of day. Given a file which has count all sold items. Use of min heap was expected.

Face to Face 1
1) Given a Binary Search Tree, in-place convert it to DLL.
2) Find the next greater element for every element in array.

Face to Face 2
1) Median of two sorted arrays.
2) Given an XML file, how will you store it in memory. Use of tree was expected.
There were some more questions that I don't remember.

Face to Face 3
1) Given a Binary Tree, check if every node is sum of all of its children.
2) Given any Binary Tree, convert it to a tree where every node is sum of all of its children.
3) Given an array, find three numbers a, b and c such that a^2 + b^2 = c^2

That is all I remember now.

Amazon Interview | Set 5

September 10, 2012

I've attended the Amazon interview in Hyderabad, This was kindle team, I got rejected but I'd like to share the experience, thought of giving back something to geeksforgeeks, which was a great reference for me.

Written test
Very straight forward
1. Given a linked list, sort without extra space.
I wrote merge sort

2. Methods to serialize & deserialize a tree ,must complete the below 2 monthods. File serialize (node *root) & node * deserialize(File f)

Cleared the written test, I was told this after 1:30 Hrs.

First round
1. Find diameter of a tree, I've seen the question here, But i didn't recollect.. So solved my self..in some primitive way which made me write code with difficulty.

2. Find a lowest common Ancestor, The variation was the tree was just a Binary Tree, Not BST, It was interesting to solve as i know only BST variation.

Second round
1. Given an array randomize it,
2. Write all possible permutations of a array of size z.
3. Given a 2-D array of 0s and 1s, find islands in it. An Island is 1s together. E.g (below there is U shaped island)
0100001
0100001
0100001
0100001
0111111

4. Write a method to check if a tree is BST or not. I wrote some stupid mistake in this code, probably that gave away my interview.

Third round
1. So many HR like questions. Why Amazon, Why u want to leave, Why u dont want to stay, what did you do to stay back, biggest challenge, worst mistake, etc etc.. blabbered something.

2. Write a method that will test a function which merges 2 sorted linked lists.

3. Design a system, which can convert books from one format to another

Fourth Round
Only one design question: Design a email client.

After 4 days and lot of anticipation, I got a mail saying I got rejected, Was wondering what they exactly look for.

Source: Amazon Chennai Interview in Hyderabad

Amazon Interview | Set 4

September 6, 2012

Please find the details of my Amazon interviews below.

Date of Interviews: 1 Sept 2012

No of Rounds: 4

Type of Interviews: Walk-in for 1 yr experienced

Round 1:

Question 1:- Given a 2D array containing only 0/1′s and each row is in sorted order. Find the row which contains maximum number of 1s.
I was asked to code. Algo which I told was I will search position of first 1 in 1st row using binary search. And mark it. Now note that position check in 2nd row. If there is 1 for that position already found in 1st row, then binary search from 0 to that position else move to row number 3. Similarly continue further.

Round 2:-

Question 1:- Given a Binary tree and two nodes. Need to find the minimum ancestor, no parent nodes given.
Each time when I told answer, they modified question little bit or removed some extra storage which I was taking.

Question 2:- Given a Binary tree and two nodes. Need to find smallest path between them

Round 3:-

Question 1:- Given an array of infinite size containing 0/1 only and in sorted order, find position of first one.

My answer: first check whether 1 is present at 100th position or not if there, do binary search between 0 and 100 else check 1 is there at 200th position, and similarly continue further.

Question 2:- Given life time of different elephants find period when maximum number of elephants lived. ex [5, 10], [6, 15], [2, 7] etc. year in which max no elephants exists.

Other questions were regarding Operating system like virtual memory etc.

Round 4:-
It was HR round. Questions related to project. Questions like why I should Hire you etc were asked.

Result is still on wait.

Amazon Interview | Set 3

August 27, 2012

Please find the details of my Amazon interviews below.

Date of Interviews: 26th July 2012

No of Rounds: 1 online exam + 4 PI

Type of Interviews: Campus Interview for freshers

Online test(Time): 90 Minutes

20 Objective Questions: Aptitude and basic C objective problems.

2 Subjective Questions:
I. Given a linked list containing character in each node, segregate its nodes in such a way that all nodes containing a vowel are moved to the end of the linked list. We will have to maintain the order.
II. Parenthesis checker.

Interview Round 1(50 mins)

Question 1: You are given two linked lists whose nodes contain a digit as data member. Both lists represent a number. You have to add them and return the resultant list.
Input: 9->9->3->4->5 and 8->9->1 (represent 99345 and 891)
Output: 1->0->0->2->3->6
My Solution: Reverse the linked lists. Create the new sum list which is reversed. Finally reverse the resultant list.

Question 2: Interviewer asked to solve the above question without changing the original lists.
My Solution: Count number of nodes in both lists. If equal then simply add two lists recursively. If not then advance a temp ptr which is a pointer to head of larger list by diff of nodes and then add the list pointed by temp and list 2. Make sure to keep track of carry. Add recursively. Propagate the carry in remaining elements of larger list. Was asked to code. Coded it.

Interview Round 2(60 mins)

Question 1: Delete nth node from end of a linked list in a single scan.

Question 2: In a linked list, in addition to the next ptr, a random ptr is also present. Clone the linked list.
Did it in O(n) but by modifying the linked list and then restoring it. Was asked to do it without making any modifications in the original list. Did that in O(n^2)

Question 3: Two nodes of a BST are given. Print the path from 1st node to the 2nd node. You are also provided the parent pointers in addition to normal left and right pointers.

Interview Round 3(1 hour)

Question 1: An array of n integers is there in which the range of elements is n, i.e., the difference between maximum and minimum number is n. Find the repeating numbers.

Question 2: An extension of Question 1. Was asked to find number of times each number is repeated.

Question 3: There are n frames of m data element each. The data element in each frame is arranged in increasing order. You are provided m*n space in which you have to arrange all data in increasing order.

My 1st solution was to use merge sort. He modified the question as only O(n) space is there and you need to send data in increasing order as fast as you can.
My 2nd solution was to use min heap and construct it with the 1st element of all n frames. Min heap also contains extra field which signifies the frame number of data elements. This data structure can do the needful.

Interview Round 4(1 hour)

Question 1: Replace each element of an array with its greatest next integer in O(n).
I couldn't do it. I tried but it didn't click. Not expected when you are in your last round.

Question 2: Reverse every k nodes of a linked list.

Well did that but was not finally selected……. 

Amazon Interview | Set 2

August 26, 2012

Please find the details of my amazon interviews below.

Date of Interviews: 26th July 2012

No of Rounds: 1 online exam + 4 PI

Type of Interviews: Campus Interview for freshers

Online test(Time): 90 Minutes

20 Objective Questions: Aptitude and basic C objective problems.

2 Subjective Questions:

I. Given a linked list containing character in each node, segregate its nodes in such a way that all nodes containing a vowel are moved to the end of the linked list. We will have to maintain the order.

II. Parenthesis checker.

Interview Round 1(30-40 Minutes):

Technical Interview

Question 1: You are given a linked list and a parameter k. You will have to swap values in a certain fashion, swap value of node 1 with node k, then node (k+1) with node 2k and go on doing this in the similar fashion

Question 2: For the above question, do it without swapping the values. If you want a swap to occur between two nodes, then you will have to move the nodes itself.

Interview Round 2(50-60 Minutes):

Technical Interview

Question 1: You are given many slabs each with a length and a breadth. A slab i can be put on slab j if both dimensions of i are less than that of j. In this similar manner, you can keep on putting slabs on each other. Find the maximum stack possible which you can create out of the given slabs.

Question 2: The above question was raised to 3 dimensions.

Question 3: The above question was then raised to k dimensions.

Questions : Then there were many questions asked on compilers and dynamic memory allocation.

Interview Round 3(50-60 Minutes):

Technical Interview

Question 1: You are given pairs of numbers. In a pair the first number is smaller with respect to the second number. Suppose you have two sets (a, b) and (c, d), the second set can follow the first set if b<c.So you can form a long chain in the similar fashion. Find the longest chain which can be formed.

Question 2: Find the longest increasing subsequence in O(nlogn). Proof and full code was required.

Question 3: You are given a linked list and an integer k. Reverse every consecutive k nodes of the given linked list.

Question 4: You are given an array. For every element you have to replace it with the closest number on the right side which is greater than the element itself.

Interview Round 4:

The team was highly impressed so they cancelled my 4th round for others who appeared for the 4th round, it was atleast an hour long.

HIRED!!

Amazon Interview | Set 1

August 24, 2012

Please find the details of my amazon interviews below.

Date of Interviews: 22nd August 2012

No of Rounds: 1 Written + 4 PI

Type of Interviews: Campus Interview for freshers

Written Test (Time): 90 Minutes

20 Objective Questions: Aptitude and basic C objective problems.

2 Subjective Questions:

I. To find if there is any root to leaf path with specified sum in a binary tree.

II. Some question based on sorting.

Interview Round 1(60-70 Minutes):

Technical Interview

Question 1: Check if a character link list is palindrome or not.

Question 2: A sorted array has been rotated r times to the left. Find r in least possible time.

Question 3: Clone a singly link list whose nodes contain, apart from next pointers, an extra pointer to any random node. The random pointer of a node N could be after N, before N or the node N itself.

Interview Round 2(50-60 Minutes):

Technical Interview

Question 1: There is a big file of words which is dynamically changing. We are continuously adding some words into it. How would you keep track of top 10 trending words at each moment?

Question 2: Write code for minHeapify() operation.

Question 3: Design a data structure for the following operations:

I. Enqueue

II. Dequeue

III. Delete a given number(if it is present in the queue, else do nothing)

IV. isNumberPresent

All these operations should take O(1) time.

Question 4: Write a function that returns the length of the longest leaf-to-leaf path in a binary tree.

Interview Round 3(60-70 Minutes):

Technical Interview

Question 1: There is a binary tree of size N. All nodes are numbered between 1-N(inclusive). There is a N*N integer matrix Arr[N][N], all elements are initialized to zero. So for all the nodes A and B, put Arr[A][B] = 1 if A is an ancestor of B (**NOT** just the immediate ancestor).

Question 2: Find an element in a sorted rotated integer array.

Question 3: There is a N*N integer matrix Arr[N][N]. From the row r and column c, we can go to any of the following three indices:

I. Arr[r+1][c-1] (valid only if c-1>=0)

II. Arr[r+1][c]

III. Arr[r+1][c+1] (valid only if c+1<=N-1)

So if we start at any column index on row 0, what is the largest sum of any of the paths till row N-1.

Interview Round 4(40-50 Minutes):

Bar Raiser Round

Interviewer asked HR Questions Initially, then a sort of puzzle.

Two robots land with their parachutes on an infinite one-dimensional number line. They both release their parachutes as soon as they land and start moving. They are allowed only to make use of the following functions.

I. moveLeft() // robot moves to left by 1 unit in 1 unit time

II. moveRight() // robot moves to right by 1 unit in 1 unit time

III. noOperation() // robot does not move and takes 1 unit time

IV. onTopOfParachute() // returns true if the robot is standing on top of either of the parachute, else false

V. didWeMeet() // returns true if the robot meets to the other robot, else false

Write a function in order to make the robots meet each other. Robots will be executing the same copy of this function.

HIRED!! 😀

Tips / Advice:

I. Each time you write a code, check for the edge cases.

II. Do not assume anything. Keep asking questions if there are any doubt