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# Amazon telephonic interview questions for SDE 1

Ques1. Find top 10 selling product given the count of sales of each product.

Ques2. Design a valet parking lot with basic use-case of assigning ticket to customer and retrieving the car later. Three sizes available. Use best fit and nearest distance.

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Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

### Source

<http://www.geeksforgeeks.org/amazon-telephonic-interview-questions-sde-1/>

# Count total set bits in all numbers from 1 to n

Given a positive integer n, count the total number of set bits in binary representation of all numbers from 1 to n.

Examples:

Input: n = 3  
Output: 4  
  
Input: n = 6  
Output: 9  
  
Input: n = 7  
Output: 12  
  
Input: n = 8  
Output: 13

Source: [Amazon Interview Question](http://geeksforgeeks.org/forum/topic/amazon-interview-question-for-software-engineerdeveloper-0-2-years-about-algorithms-17)

**Method 1 (Simple)**  
 A simple solution is to run a loop from 1 to n and sum the count of set bits in all numbers from 1 to n.

// A simple program to count set bits in all numbers from 1 to n.  
#include <stdio.h>  
  
// A utility function to count set bits in a number x  
unsigned int countSetBitsUtil(unsigned int x);  
  
// Returns count of set bits present in all numbers from 1 to n  
unsigned int countSetBits(unsigned int n)  
{  
 int bitCount = 0; // initialize the result  
  
 for(int i = 1; i <= n; i++)  
 bitCount += countSetBitsUtil(i);  
  
 return bitCount;  
}  
  
// A utility function to count set bits in a number x  
unsigned int countSetBitsUtil(unsigned int x)  
{  
 if (x <= 0)  
 return 0;  
 return (x %2 == 0? 0: 1) + countSetBitsUtil (x/2);  
}  
  
// Driver program to test above functions  
int main()  
{  
 int n = 4;  
 printf ("Total set bit count is %d", countSetBits(n));  
 return 0;  
}

Output:

Total set bit count is 6

Time Complexity: O(nLogn)

**Method 2 (Tricky)**  
 If the input number is of the form 2^b -1 e.g., 1,3,7,15.. etc, the number of set bits is b \* 2^(b-1). This is because for all the numbers 0 to (2^b)-1, if you complement and flip the list you end up with the same list (half the bits are on, half off).

If the number does not have all set bits, then some position m is the position of leftmost set bit. The number of set bits in that position is n – (1

1) The bits in the (m-1) positions down to the point where the leftmost bit becomes 0, and  
 2) The 2^(m-1) numbers below that point, which is the closed form above.

An easy way to look at it is to consider the number 6:

0|0 0  
0|0 1  
0|1 0  
0|1 1  
-|–  
1|0 0  
1|0 1  
1|1 0

The leftmost set bit is in position 2 (positions are considered starting from 0). If we mask that off what remains is 2 (the “1 0″ in the right part of the last row.) So the number of bits in the 2nd position (the lower left box) is 3 (that is, 2 + 1). The set bits from 0-3 (the upper right box above) is 2\*2^(2-1) = 4. The box in the lower right is the remaining bits we haven’t yet counted, and is the number of set bits for all the numbers up to 2 (the value of the last entry in the lower right box) which can be figured recursively.

// A O(Logn) complexity program to count set bits in all numbers from 1 to n  
#include <stdio.h>  
  
/\* Returns position of leftmost set bit. The rightmost  
 position is considered as 0 \*/  
unsigned int getLeftmostBit (int n)  
{  
 int m = 0;  
 while (n > 1)  
 {  
 n = n >> 1;  
 m++;  
 }  
 return m;  
}  
  
/\* Given the position of previous leftmost set bit in n (or an upper  
 bound on leftmost position) returns the new position of leftmost  
 set bit in n \*/  
unsigned int getNextLeftmostBit (int n, int m)  
{  
 unsigned int temp = 1 << m;  
 while (n < temp)  
 {  
 temp = temp >> 1;  
 m--;  
 }  
 return m;  
}  
  
// The main recursive function used by countSetBits()  
unsigned int \_countSetBits(unsigned int n, int m);  
  
// Returns count of set bits present in all numbers from 1 to n  
unsigned int countSetBits(unsigned int n)  
{  
 // Get the position of leftmost set bit in n. This will be  
 // used as an upper bound for next set bit function  
 int m = getLeftmostBit (n);  
  
 // Use the position  
 return \_countSetBits (n, m);  
}  
  
unsigned int \_countSetBits(unsigned int n, int m)  
{  
 // Base Case: if n is 0, then set bit count is 0  
 if (n == 0)  
 return 0;  
  
 /\* get position of next leftmost set bit \*/  
 m = getNextLeftmostBit(n, m);  
  
 // If n is of the form 2^x-1, i.e., if n is like 1, 3, 7, 15, 31,.. etc,   
 // then we are done.   
 // Since positions are considered starting from 0, 1 is added to m  
 if (n == ((unsigned int)1<<(m+1))-1)  
 return (unsigned int)(m+1)\*(1<<m);  
  
 // update n for next recursive call  
 n = n - (1<<m);  
 return (n+1) + countSetBits(n) + m\*(1<<(m-1));  
}  
  
// Driver program to test above functions  
int main()  
{  
 int n = 17;  
 printf ("Total set bit count is %d", countSetBits(n));  
 return 0;  
}

Total set bit count is 35

Time Complexity: O(Logn). From the first look at the implementation, time complexity looks more. But if we take a closer look, statements inside while loop of getNextLeftmostBit() are executed for all 0 bits in n. And the number of times recursion is executed is less than or equal to set bits in n. In other words, if the control goes inside while loop of getNextLeftmostBit(), then it skips those many bits in recursion.

Thanks to [agatsu](http://geeksforgeeks.org/forum/topic/amazon-interview-question-for-software-engineerdeveloper-0-2-years-about-algorithms-17#post-34987)and [IC](http://geeksforgeeks.org/forum/topic/amazon-interview-question-for-software-engineerdeveloper-0-2-years-about-algorithms-17#post-34436) for suggesting this solution.

**See** [**this**](http://www.geeksforgeeks.org/archives/16703#comment-9236)**for another solution suggested by Piyush Kapoor.**

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

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<http://www.geeksforgeeks.org/count-total-set-bits-in-all-numbers-from-1-to-n/>

# Amazon Interview | Set 1

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 doubts.

This article is compiled by **Akash Nawani**. Many Many congratulations to Akash for his selection in Amazaon. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/), [Interview Experience](http://www.geeksforgeeks.org/tag/interview-experience/)

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<http://www.geeksforgeeks.org/amazon-interview/>

# Convert a BST to a Binary Tree such that sum of all greater keys is added to every key

Given a Binary Search Tree (BST), convert it to a Binary Tree such that every key of the original BST is changed to key plus sum of all greater keys in BST.

Examples:

Input: Root of following BST  
 5  
 / \  
 2 13  
  
Output: The given BST is converted to following Binary Tree  
 18  
 / \  
 20 13

Source: [Convert a BST](http://www.geeksforgeeks.org/forum/topic/convert-a-bst)

**Solution:** Do reverse Inoorder traversal. Keep track of the sum of nodes visited so far. Let this sum be *sum*. For every node currently being visited, first add the key of this node to *sum*, i.e. *sum* = *sum* + *node->key*. Then change the key of current node to *sum*, i.e., *node->key = sum*.  
 When a BST is being traversed in reverse Inorder, for every key currently being visited, all keys that are already visited are all greater keys.

// Program to change a BST to Binary Tree such that key of a node becomes  
// original key plus sum of all greater keys in BST  
#include <stdio.h>  
#include <stdlib.h>  
  
/\* A BST node has key, left child and right child \*/  
struct node  
{  
 int key;  
 struct node\* left;  
 struct node\* right;  
};  
  
/\* Helper function that allocates a new node with the given key and  
 NULL left and right pointers.\*/  
struct node\* newNode(int key)  
{  
 struct node\* node = (struct node\*)malloc(sizeof(struct node));  
 node->key = key;  
 node->left = NULL;  
 node->right = NULL;  
 return (node);  
}  
  
// A recursive function that traverses the given BST in reverse inorder and  
// for every key, adds all greater keys to it  
void addGreaterUtil(struct node \*root, int \*sum\_ptr)  
{  
 // Base Case  
 if (root == NULL)  
 return;  
  
 // Recur for right subtree first so that sum of all greater  
 // nodes is stored at sum\_ptr  
 addGreaterUtil(root->right, sum\_ptr);  
  
 // Update the value at sum\_ptr  
 \*sum\_ptr = \*sum\_ptr + root->key;  
  
 // Update key of this node  
 root->key = \*sum\_ptr;  
  
 // Recur for left subtree so that the updated sum is added  
 // to smaller nodes  
 addGreaterUtil(root->left, sum\_ptr);  
}  
  
// A wrapper over addGreaterUtil(). It initializes sum and calls  
// addGreaterUtil() to recursivel upodate and use value of sum  
void addGreater(struct node \*root)  
{  
 int sum = 0;  
 addGreaterUtil(root, &sum);  
}  
  
// A utility function to print inorder traversal of Binary Tree  
void printInorder(struct node\* node)  
{  
 if (node == NULL)  
 return;  
 printInorder(node->left);  
 printf("%d ", node->key);  
 printInorder(node->right);  
}  
  
// Driver program to test above function  
int main()  
{  
 /\* Create following BST  
 5  
 / \  
 2 13 \*/  
 node \*root = newNode(5);  
 root->left = newNode(2);  
 root->right = newNode(13);  
  
 printf(" Inorder traversal of the given tree\n");  
 printInorder(root);  
  
 addGreater(root);  
  
 printf("\n Inorder traversal of the modified tree\n");  
 printInorder(root);  
  
 return 0;  
}

Output:

Inorder traversal of the given tree  
2 5 13  
 Inorder traversal of the modified tree  
20 18 13

Time Complexity: O(n) where n is the number of nodes in given Binary Search Tree.

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/), [BST](http://www.geeksforgeeks.org/tag/bst/)

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<http://www.geeksforgeeks.org/convert-bst-to-a-binary-tree/>

# [TopTalent.in] Google, Facebook, Amazon, Walmart & PocketGems, All Fighting For Prasoon Mishra

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/Prasoon1-1.png)Meet Prasoon, he was just your average guy who studied at IIIT-Hyderabad but today Prasoon Mishra is one of the most well know names across engineering colleges across India. Last week we got a request from one of our readers that he and his friends want us to Interview Prasoon and today here we are fulfilling their wish.

This really tells us how much people are waiting in anticipation for his interview. So, we went a step ahead, we not only would like to present his interview but we also have his resume for you to download.

So [click here](http://www.toptalent.in/jobseeker-login.php) to download his resume by logging in. Here is the much awaited interview of Prasoon Misra as he shares his thoughts about his interview experience.

**TopTalent: Firstly, how do you feel when so many world class companies are trying to woo you?**

**Prasoon:** I am greatly overwhelmed! I never imagined such a scenario, so I am delighted that so many companies considered me worthy of an offer.  It feels good to know that I did things right. And, it’s always a treat to see your hard work rewarded.

All these companies are highly reputable and they are very selective in their hiring, but a lot of engineers get hired from across the world. So, its important to keep things in perspective and not get carried away. I can join just one company, so all these offers are equivalent to just one good offer. And hence, at the end of the day, I see it as a good job opportunity.

**TopTalent: Which company are you planning to join and how did you make that decision?**

**Prasoon:** Yes, that was a very tough call. It was extremely confusing. They are all top tech companies, and each had a lot to offer in terms of the role, work and responsibility. Google, given their array of products – it’s a crime for an engineer to decline their offer. Walmart & PocketGems have quality work and good growth opportunities. Amazon also offered a very good profile. But, I chose Facebook because I feel that it is a better cultural fit for me at this stage. Even after their IPO, they are trying to preserve their startup culture, and continues to offer a lot of opportunities . That just nicked it in the end!

**TopTalent: Can you give us a brief account of what you felt was the toughest interview?**

**Prasoon:** Its hard to pin-point a single tough interview. Each company had its own style. Facebook & Pocketgems had very intense and focused rounds, revolving around coding/algo and system-design. They were looking for speed and accuracy. At Google, as can be expected, some really tough algo questions came up. I am unsure about the complete correctness of one of my solutions, even now. In another round, I was able to convince the interviewer that his solution had the same flaws as my solution. So, that was a confidence booster. Walmart though, was a bit unexpected. In a design round, my initial solution was built around a string algorithm. But, the interviewer pointed out some counter-cases. So, by relying on his hints and the counter-cases, some probabilistic techniques got incorporated into the system. At the end, the interviewer informed me that my final solution was a model in machine-learning. So, I feel that mathematical aptitude helps in more ways than just algorithm design.

**TopTalent: What kind of skill-set companies are looking for in candidates?**

**Prasoon:** Well, a strong understanding of data structures and algorithms, along with fast-and-accurate coding skills are the primary requirement. And companies pay particular attention to the quality of code -> neat, short & easy to understand.

Moreover, a good aptitude in Computer Science is also desired. The fundamentals of OS, DBMS, distributed systems, design patterns, etc, often get applied indirectly in the design rounds. In this regard, I feel that a basic understanding of common systems like search-engines, spell checkers, trends, etc, helps one greatly.

And, companies inherently dig for creativity. The above mentioned skills are just tools to come up with smart solutions.

**TopTalent: Whats your advice to students who are aiming for similar placement offers as yours?**

**Prasoon:** Do not get burdened by the hype surrounding these jobs. And after that, I think its extremely important to enjoy the subject and the process of preparation. In my opinion, there is an element of luck involved with interviews, and candidates must acknowledge it. Hence, they must not over-pressurize themselves. And, all wise proverbs about success strictly apply.

**TopTalent: What should one keep in mind while preparing a resume?**

**Prasoon:** One must understand that the resume is ones first impression. So, it’s important to be precise and accurate in terms of what one wants to convey. A lot of tips are available on the internet, and one can pay heed to them. In terms of the content, I chose to write projects that had good depth, and discard the lighter ones. I feel that this enhances the strength of the resume.

Other than these, one must prepare oneself to have a detailed discussion on everything that is mentioned in the resume.

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<http://www.geeksforgeeks.org/google-facebook-amazon-walmart-pocketgems-all-fighting-for-prasoon-mishra/>

# [TopTalent.in] Exclusive Interview with Vivek Ruparel who got into Amazon

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/vivek_dp.jpg)Vivek was quite happy when he cracked his first ever interview on campus. The thought of enjoying the college life in last year without the pain of campus interviews seemed quite pleasant.  He could crack this amazing company by being dedicated and disciplined in his interview preparation. As he recalls ‘I used to practice atleast 6 problems a day for two months before my interviews.‘ We at [TopTalent.in](http://www.toptalent.in/) spoke to Vivek  from Jadavpur University about his experience of giving an Amazon interview and what advise he had to offer for others looking to achieve something similar.

You can also [download](https://www.toptalent.in/jobseeker-registration.php) his resume to see how you can do it too.

**TopTalent: What companies did you get offer from apart from Amazon?**

As Amazon was the first company in our campus, I didn’t get a chance to sit for other companies. So its only Amazon interview that I can share with you.

**TopTalent: How do you feel on achieving this feat?**

It feels great. No better feeling than hearing your name in the final bunch of shortlisted students. If one puts his effort with full dedication, it does pay off.

**TopTalent: Can you give us a brief account of what you felt was the toughest interview?**

Since I have only gone through the Amazon interview process, so its Amazon by default. I can definitely share the toughest round I came across during my interviews. It was a question based on arrays. It was pretty tough. I was able to solve  this question and I think this question sealed my place in Amazon.

**TopTalent: What was your preparation strategy?**

Not just going through the codes but finding the solution and implementing them on my own, no matter how long it took. That is the most important thing according to me that helped me crack this interview. Second thing was regular coding  to crack the online coding rounds. I used to practice atleast 6 problems a day for two months before my interviews. Third was the getting familiar with all data structures and algorithms.

**TopTalent: What resources did you consult? Where did you practice problems from?**

1. Geeksforgeeks is a must for Data structures and algorithms.

4. Book : Programming Interviews Exposed

**TopTalent: What kind of skills do you think helped you getting this job?**

CS fundamentals is very important . My 3rd round was completely on CS fundamentals. It lasted around for 1hr and 15 minutes. One should not ignore CS fundamentals when preparing for interviews . Data structures and algorithms is must as all know. Choosing one site and practice coding regularly is also very important.

**TopTalent: What’s your advice to students who are aiming for similar placement offers as yours?**

1. Don’t just go through the codes. First try it on your own, that’s very important. Once you have cracked a problem, write it in a paper and check for the corner cases.

2. For the coding part, once you have cracked a problem, always try to run the program at one go.

3. OS, DBMS and Networking. If you get a good hold on these subjects, it will make you stand apart from other candidates.

**TopTalent: What should one keep in mind while preparing a resume?**

My resume had only one page in it. I would suggest to keep only relevant information in the resume. Most important thing, one should be ready to answer any query on everything in his or her resume.

In case you missed, you can also [**download his resume**](https://www.toptalent.in/jobseeker-registration.php) by logging in.

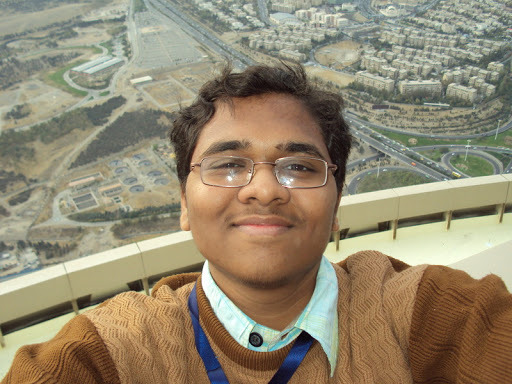
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# [TopTalent.in] Interview with Sujeet Gholap, placed in Microsoft, Google, Samsung, Goldman Sachs & Tower Research

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/Sujeet.jpg)  
 It’s not every day that you come across a person who has achieved so much in life at a very young age which others can only dream of achieving in their entire lifetime. His simplicity and positive attitude speak volumes for his recent success after facing some tough times. This is the story of Sujeet Gholap, a IIT Madras grad who received record breaking 6 offers from some of the best companies in the world namely Google, Microsoft, Samsung (US), Samsung (IN), Goldman Sachs and Tower Research. We at [TopTalent.in](http://www.toptalent.in/) had a chance to interact with Sujeet about his success, preparation, interviews and some hardships. This interview is an excellent example of how a small town boy can achieve greatness and how you can do it too.

*Also, Sujeet has agreed to share his stellar resume with our users which can help you with your resume and preparation. So, don’t forget to*[***download***](http://www.toptalent.in/jobseeker-login.php)*his resume by logging in.*

**Team TopTalent: Can you tell us a bit about your background before joining IIT Madras?**

**Sujeet:**Sure. I hail from a small town called Kallam from Osmanabad district of Maharashtra. I studied in a local school in Marathi medium till 10th standard. I always thought people from cities would do much better than me as I studied every subject in Marathi. My mom and dad teach at a local college there. I am currently pursuing my B.Tech in Computer Science and Engineering at IIT Madras. In IITJEE 2009, I secured an all India rank of 184

**Team TopTalent: Can you give us a brief account of your interview experience for these companies?**

**Sujeet:**All my interviews (except a couple) were technical interviews. Almost in each one, I had to tell what I did during my internships at Yahoo! and Facebook, what projects I have worked on. Many questions followed a similar monotone : arrays of integers, do something with them, biased coins and their tosses, trees and recursive algorithms, writing code on paper and explaining it to the interviewer, solving mathematical and logical puzzles etc. Interviews varied from very easy to very challenging. Some interviewers were impressed by JEE rank and CGPA while some did not give it even a second glance. Some interviewers were interested in the projects I did and asked detailed questions about it, while some were just interested in whether I can solve the problem they have given me.

**Team TopTalent: So, how did it feel when you landed six massive offers on that day?**

**Sujeet:**It felt nice and gave an ego boost when people referred to me as “the guy with six offers”. People I barely knew, smiling at me and congratulating me! I was on an all-time-high. Jumping around and laughing all the time. It was such a kick that the next day, although it was a normal and fine day, as it was down compared to previous day’s high, I was actually a bit gloomy!

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**Sujeet:**I was supposed to finalize on a company by afternoon and I was in the state of utter confusion. Whether to take Google, which is the dream job of most of the programmers or to take Samsung, whose software division is nascent and where my contribution and impact would be much larger, visible and maybe even play a key part in company’s direction or to take Goldman Sachs, the challenging job which I always wanted to get a taste of or to go with Tower Research, the highest paying Indian job (twice as high as the second highest) which also involves inviting challenges and lots of programming. I was realizing that it wasn’t really a good idea after all to go for so many options. I was wondering whether I would have been better off without a choice, as all these companies were such that I would have accepted the offer without giving it any thought at all had it been the only offer. I finally decided to go with Google.

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**Team TopTalent: How did you prepare for these interviews? What suggestions can you give to our users who might have similar interviews lined up?**

**Sujeet:**I was lucky that I had discussed about similar questions before, and hence was able to make it through the interviews. I was quite attentive in class which really helped me a lot. Any questions which were not algorithm intensive questions and were more or less straight knowledge based, I could just recall the answer straight from the class when the professor taught that particular topic! Being friends with the right people and forming a peer group with a common interest is something which was critical to my success. I used to solve coding challenges with Arijit who had a very good Topcoder Rank. I would think about how I would solve those problem, if I get it, I would call him up and discuss the answer and ask for more.

In terms of suggestions, I would say be an active member of topcoder, keep solving programming problems in other places too if you want like spoj, usaco. I wish I had taken these things seriously and honed my algorithmic programming skills. Be thorough with Introduction to Algorithms by CLRS and do problems on one of the above mentioned sites.

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# [TopTalent.in] Interview with Pradeep Verma from NIT Trichy who talks about his internship at Amazon

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/pradeep.jpg)Pradeep Verma calls himself just one of those Indian kids but Amazon usually doesn’t recruit every other kid out there. Pradeep did his internship at Amazon last summer and not surprisingly got a full time offer from the e-commerce giant thanks to his excellent performance. In an interview with [TopTalent.in](http://www.toptalent.in/) he talks about his internship experience and how it benefited him.

You can also download his [resume](http://www.toptalent.in/jobseeker-registration.php) to see his credentials and understand what made him standout.

**1. Can you briefly describe your background?**

I hail from Visakhapatnam, a city in Andhra Pradesh. I ended up with an AIR 6025 in IIT and an AIR 1745 in AIEEE. Now, I am pursuing my B Tech final year in Computer Science and Engineering at NIT Trichy. My dad works for the Government and my mom is a homemaker. Prior to engineering, I was not any different from other Indian kids. As I entered NIT, I quickly grabbed some interest into Computers and worked my way through to get into a Computer Club at college (called DELTA). Apart from this, I am into many other teams at college conducting and organizing events/fests. I am the Marketing Chairman for NIT Trichy’s International Cultural Festival, Festember. I pursued research on “Parallel Algorithms – Task Assignment” for some time and I am expecting to publish a paper on this topic very soon.

**2. Can you describe the complete hiring process? Did your internship help you grab this offer?**

Amazon came to our campus to hire interns. The Selection Process consisted of a written test, programming test followed by two interviews. We were tested on Data Structures, Algorithms and OOP Concepts during the interviews. I did an intern at Amazon in the summer of 2013 post which I have been offered a Pre-Placement Offer from them.

**3. What project did you work on during your internship?**

Amazon, as all of us know is a giant in e-commerce. Something very astonishing about Amazon is the scale at which they function. At some points the servers at Amazon need to handle something close to 10,000 orders per minute. So in this company, speed and complexity handling is a great challenge considering the scale at which they function.

My project was along the same lines – I had to bring down the running time of a “process” [confidential and cannot be disclosed] from 2 to 4 hours to something close to 15 minutes. I used AWS and Java Technologies to achieve the same.

**4. What were the tricky questions you encountered? How did you tackle them?**

I was questioned on Data Structures, Algorithms, OOPs and other basic concepts. I still remember one question in which they asked me to choose a favorite game and give an OOP model for the same. This is something real and application of what we read in books. This involved a lot of thinking and I liked the way they asked it. Apart during the intern I required concepts from Operating System, Threads, Basic Algos and DBMS to complete my project.

**5. How much preparation did you put in to get this opportunity?**

I should say I dint put any focused preparation for the above. I went with the flow, grabbed all opportunities to learn and innovate. I feel what companies look for is an overall well developed person. So I guess my involvement into a lot of clubs and activities, decent tech knowledge and my projects got me this opportunity.

**6. What is your advice to other aspirants looking for similar opportunity?**

Technically, get to know all basics of Algos, DS, OS, DBMS, Networks etc. I would recommend interview designed books like “Cracking the Coding Interview” by Gayle Lakmann and “DataStructures and Algorithms” by Narasimha Karumanchi. Apart one great opinion I have is, it is just not enough to be a good coder, develop in all aspects – Have a decent pointer, grab all opportunities (you have a lot of them in IITs and NITs), get social, learn some tech, do some cool projects and any company would be more than happy to have you with them.

**7. What should one keep in mind while preparing a resume?**

A resume is one page reflection of YOU. It is important to customize a resume for companies. For eg Research projects would interest Microsoft R&D profile and Coding projects would attract Facebook or Google.  And one thing I find in most resumes is people put a lot of unnecessary stuff. No one out there really bothers if you had won some Bronze medal in a quiz when you were in 6th Class at School Level.  Get to real stuff. Put yourself into a shoe of a recruiter and think what you would look for in a resume.  And it is very important to proof read your resume. Having spelling mistakes on a resume could be a blunder.

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<http://www.geeksforgeeks.org/interview-pradeep-verma-nit-trichy-talks-internship-amazon/>

# [TopTalent.in] Exclusive Interview with Vivek Ruparel who got into Amazon

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/vivek_dp.jpg)Vivek was quite happy when he cracked his first ever interview on campus. The thought of enjoying the college life in last year without the pain of campus interviews seemed quite pleasant.  He could crack this amazing company by being dedicated and disciplined in his interview preparation. As he recalls ‘I used to practice atleast 6 problems a day for two months before my interviews.‘ We at [TopTalent.in](http://www.toptalent.in/) spoke to Vivek  from Jadavpur University about his experience of giving an Amazon interview and what advise he had to offer for others looking to achieve something similar.

You can also [download](https://www.toptalent.in/jobseeker-registration.php) his resume to see how you can do it too.

**TopTalent: What companies did you get offer from apart from Amazon?**

As Amazon was the first company in our campus, I didn’t get a chance to sit for other companies. So its only Amazon interview that I can share with you.

**TopTalent: How do you feel on achieving this feat?**

It feels great. No better feeling than hearing your name in the final bunch of shortlisted students. If one puts his effort with full dedication, it does pay off.

**TopTalent: Can you give us a brief account of what you felt was the toughest interview?**

Since I have only gone through the Amazon interview process, so its Amazon by default. I can definitely share the toughest round I came across during my interviews. It was a question based on arrays. It was pretty tough. I was able to solve  this question and I think this question sealed my place in Amazon.

**TopTalent: What was your preparation strategy?**

Not just going through the codes but finding the solution and implementing them on my own, no matter how long it took. That is the most important thing according to me that helped me crack this interview. Second thing was regular coding  to crack the online coding rounds. I used to practice atleast 6 problems a day for two months before my interviews. Third was the getting familiar with all data structures and algorithms.

**TopTalent: What resources did you consult? Where did you practice problems from?**

1. Geeksforgeeks is a must for Data structures and algorithms.

4. Book : Programming Interviews Exposed

**TopTalent: What kind of skills do you think helped you getting this job?**

CS fundamentals is very important . My 3rd round was completely on CS fundamentals. It lasted around for 1hr and 15 minutes. One should not ignore CS fundamentals when preparing for interviews . Data structures and algorithms is must as all know. Choosing one site and practice coding regularly is also very important.

**TopTalent: What’s your advice to students who are aiming for similar placement offers as yours?**

1. Don’t just go through the codes. First try it on your own, that’s very important. Once you have cracked a problem, write it in a paper and check for the corner cases.

2. For the coding part, once you have cracked a problem, always try to run the program at one go.

3. OS, DBMS and Networking. If you get a good hold on these subjects, it will make you stand apart from other candidates.

**TopTalent: What should one keep in mind while preparing a resume?**

My resume had only one page in it. I would suggest to keep only relevant information in the resume. Most important thing, one should be ready to answer any query on everything in his or her resume.

In case you missed, you can also [**download his resume**](https://www.toptalent.in/jobseeker-registration.php) by logging in.

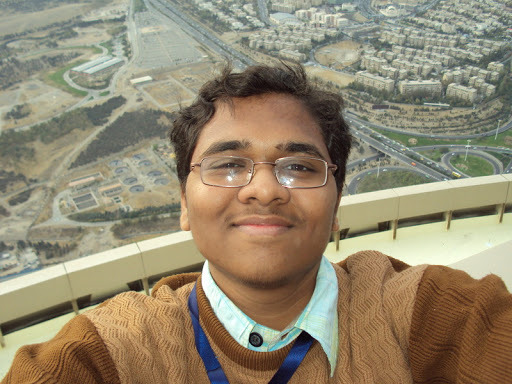
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# [TopTalent.in] Interview with Sujeet Gholap, placed in Microsoft, Google, Samsung, Goldman Sachs & Tower Research

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/Sujeet.jpg)  
 It’s not every day that you come across a person who has achieved so much in life at a very young age which others can only dream of achieving in their entire lifetime. His simplicity and positive attitude speak volumes for his recent success after facing some tough times. This is the story of Sujeet Gholap, a IIT Madras grad who received record breaking 6 offers from some of the best companies in the world namely Google, Microsoft, Samsung (US), Samsung (IN), Goldman Sachs and Tower Research. We at [TopTalent.in](http://www.toptalent.in/) had a chance to interact with Sujeet about his success, preparation, interviews and some hardships. This interview is an excellent example of how a small town boy can achieve greatness and how you can do it too.

*Also, Sujeet has agreed to share his stellar resume with our users which can help you with your resume and preparation. So, don’t forget to*[***download***](http://www.toptalent.in/jobseeker-login.php)*his resume by logging in.*

**Team TopTalent: Can you tell us a bit about your background before joining IIT Madras?**

**Sujeet:**Sure. I hail from a small town called Kallam from Osmanabad district of Maharashtra. I studied in a local school in Marathi medium till 10th standard. I always thought people from cities would do much better than me as I studied every subject in Marathi. My mom and dad teach at a local college there. I am currently pursuing my B.Tech in Computer Science and Engineering at IIT Madras. In IITJEE 2009, I secured an all India rank of 184

**Team TopTalent: Can you give us a brief account of your interview experience for these companies?**

**Sujeet:**All my interviews (except a couple) were technical interviews. Almost in each one, I had to tell what I did during my internships at Yahoo! and Facebook, what projects I have worked on. Many questions followed a similar monotone : arrays of integers, do something with them, biased coins and their tosses, trees and recursive algorithms, writing code on paper and explaining it to the interviewer, solving mathematical and logical puzzles etc. Interviews varied from very easy to very challenging. Some interviewers were impressed by JEE rank and CGPA while some did not give it even a second glance. Some interviewers were interested in the projects I did and asked detailed questions about it, while some were just interested in whether I can solve the problem they have given me.

**Team TopTalent: So, how did it feel when you landed six massive offers on that day?**

**Sujeet:**It felt nice and gave an ego boost when people referred to me as “the guy with six offers”. People I barely knew, smiling at me and congratulating me! I was on an all-time-high. Jumping around and laughing all the time. It was such a kick that the next day, although it was a normal and fine day, as it was down compared to previous day’s high, I was actually a bit gloomy!

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**Sujeet:**I was supposed to finalize on a company by afternoon and I was in the state of utter confusion. Whether to take Google, which is the dream job of most of the programmers or to take Samsung, whose software division is nascent and where my contribution and impact would be much larger, visible and maybe even play a key part in company’s direction or to take Goldman Sachs, the challenging job which I always wanted to get a taste of or to go with Tower Research, the highest paying Indian job (twice as high as the second highest) which also involves inviting challenges and lots of programming. I was realizing that it wasn’t really a good idea after all to go for so many options. I was wondering whether I would have been better off without a choice, as all these companies were such that I would have accepted the offer without giving it any thought at all had it been the only offer. I finally decided to go with Google.

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**Sujeet:**I was lucky that I had discussed about similar questions before, and hence was able to make it through the interviews. I was quite attentive in class which really helped me a lot. Any questions which were not algorithm intensive questions and were more or less straight knowledge based, I could just recall the answer straight from the class when the professor taught that particular topic! Being friends with the right people and forming a peer group with a common interest is something which was critical to my success. I used to solve coding challenges with Arijit who had a very good Topcoder Rank. I would think about how I would solve those problem, if I get it, I would call him up and discuss the answer and ask for more.

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# Amazon Interview | Set 6

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.

Thanks to **Vivek** for sharing Amazon Interview Questions. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks

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# Amazon Interview | Set 2

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!!**

This article is compiled by **Jinendra Baid**. Many Many congratulations to Jinendra for his selection in Amazaon. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 28

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*.”

This article is compiled by Rohit. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/), [Interview Experience](http://www.geeksforgeeks.org/tag/interview-experience/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-3/>

# Amazon Interview | Set 3

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……. 

This article is compiled by **Vinay Khetan**. We will be soon publishing Vinay’s Yahoo and Microsoft interviews as separate posts. Vinay was selected in Microsoft. Many Many congratulations to Vinay for his selection.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/), [Interview Experience](http://www.geeksforgeeks.org/tag/interview-experience/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-set-3/>

# Amazon Interview | Set 4

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.

This article is compiled by **Naveen Kumar Singh**. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-4-2/>

# Amazon Interview | Set 5

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](http://geeksforgeeks.org/forum/topic/amazon-chennai-interview-in-hyderabad)

Thanks to muzicisgod for sharing Amazon Interview Questions. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-4-3/>

# Amazon Interview | Set 9

**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!**

Thanks to **Hitesh** for sharing Amazon Interview experience. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-8-2/>

# Amazon Interview | Set 8

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. 

This was probably the most difficult of all the interviews I have ever had.

Hope it helps some of you ..

Thanks to **ganglu** for sharing Amazon Interview experience. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-8/>

# Amazon Interview | Set 9 (Answers)

This post is about answers to the questions asked in [Amazon Interview | Set 9](http://www.geeksforgeeks.org/archives/27276). It contains links to some of the solutions available on the geeksforgeeks. I have also written my answers which I replied in the interview. I hope it would help the readers.

**Online Programming Round: (5 methods, 2 hours)**

**3)**  <http://www.geeksforgeeks.org/archives/10379>

**5)**    <http://www.geeksforgeeks.org/archives/12832>

**Telephonic Interview 1:**

**1)**    <http://www.geeksforgeeks.org/archives/24272>

**2)**    <http://www.geeksforgeeks.org/archives/18752>

**3)**   <http://www.geeksforgeeks.org/archives/2398>

**Telephonic Interview 2:**

**3)**    Find the distance of every other point from P. Then use of max-heap of size K. <http://www.geeksforgeeks.org/archives/2392>

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

**2)**    I gave the following solution (with the help of the interviewer):

1. For every set, find out the number of sets it has intersection with. Also maintain those set indices.

2. Remove the set which has maximum number of intersection. And update the remaining numbers.

3. Repeat step 2 till we have any set which has intersection with any other set. At the end, we will have the solution. (Still not sure about optimality).

We can relate the solution with graphs: Remove some nodes so that remaining all the nodes are isolated nodes.

Searching: To make searching efficient, we can build trie data structure using bits for every set. So that we can find the intersections fasters.

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

**1)**    I tried for some time. Then the interviewer gave me the formula. The number is 1+ceil((N-W)/S) in all the cases.

For second part of question, simple solution is to find min in every window. But we can optimize so that we can utilize previous results/previous min.

*Bit optimal:* I created a min-heap of W elements. But the heap contained indices of the array elements, not the values inside the array itself. The indices were stored in heap as per their values in the array. Then for a new window, search the heap linearly (heap was in form of array), replace the old indices (which are no longer in the new window) with the new indices, and adjust that index in the heap. After adjusting all the new indices, we will have new min for the new window at the root. (Not sure whether the complexity brought in to the solution is worth!)

**Face-to-face Interview 3:**

**2)**     I gave a solution based on trie data structure using characters of the string. But he suggested to build trie based on the string itself. However, I was not able to think in that way.

**3)**    Linear search. Binary search.

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

**2)**     I said, we can organize an online coding competition. People would register and we will have the details. He replied, it’s too expensive. Then I said, we can postpone the competition!

**All the Best!**

Thanks to **Hitesh** for sharing his answers. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/), [Interview Experience](http://www.geeksforgeeks.org/tag/interview-experience/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-set-9-answers/>

# Amazon Interview | Set 10

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.

Thanks to **Vinay** for sharing Amazon Interview experience. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-10/>

# Amazon Interview | Set 11

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 

This article is compiled by **Supreeth**. Many Many congratulations to Supreeth. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-11/>

# Amazon Interview | Set 12

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

1  
 2 3  
 4 5 6  
 7 8 9 10

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.

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<http://www.geeksforgeeks.org/amazon-interview-set-12/>

# Amazon Interview | Set 15

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.

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<http://www.geeksforgeeks.org/amazon-interview-set-13-2/>

# Amazon Interview | Set 13

**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.

This article is compiled by **Ramendra**. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-13/>

# Amazon Interview | Set 14

**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.

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<http://www.geeksforgeeks.org/amazon-interview-set-14-2/>

# Amazon Interview | Set 16

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.

This article is compiled by **Ayush**. Many Many congratulations to Ayush for his selection in Amazon. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-16/>

# Amazon Interview | Set 17

**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.

This article is compiled by **Yogesh**. Many Many congratulations to Yogesh for his selection. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-17/>

# Amazon Interview | Set 18

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

This article is compiled by **Sahil**. Many Many congratulations to Sahil for his selection. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-18/>

# Amazon Interview | Set 19

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.

Before this round, I had good hope of getting selected, but no one can give such a bad last interview and get selected and hence after 2 weeks got a rejection mail.

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<http://www.geeksforgeeks.org/amazon-interview-set-19/>

# Amazon Interview | Set 20

**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  
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   
This article is compiled by Bharath jhadey. Many Many congratulations to Bharath for his selection. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.  
   
   
 

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<http://www.geeksforgeeks.org/amazon-interview-set-20/>

# Amazon Interview | Set 21

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.

This article is compiled by **Ranganath**. Many Many congratulations to Ranganath for his selection. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-21/>

# Amazon Interview | Set 22

**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 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”.

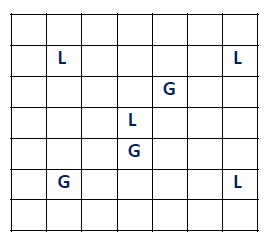
**Face to face: Round 1(Technical, 1 hour):**  
 **1.** Given a binary search tree. Find two numbers in the tree whose sum is k. If there are no such elements, state so. Assume that the tree is balanced.  
 O(n) solution with O(logn) space was expected. Solved using two stacks. Code was required.  
 **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.

1   
 2 3   
 4 5 6   
 7 8 9 10

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)  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/MicroSoftInterview.png)

**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]

This article is compiled by **Shredder Woods**. Many Many congratulations to Shredder for his selection. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-22/>

# Amazon Interview | Set 23

**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.

I am still not able to find the correct reason behind it. And Now I am frustrated.

This article is compiled by anonymous user. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-23/>

# Amazon Interview | Set 24

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.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-24/>

# Amazon Interview | Set 25

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.

This article is compiled by Pandu. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-25/>

# Amazon Interview | Set 26

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.

This article is compiled by **Mayur Kale**. Many Many congratulations to him. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-26/>

# Amazon Interview | Set 27

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.

This article is compiled by **Neha Gupta**. Many Many congratulations to Neha. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-27/>

# Amazon Interview | Set 29

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 !!

Heartly Thanks To GeeksForGeeks Community And Their Coding Stuff Which is available in Site !!

This article is compiled by Pushpendra Mishra. Many Many congratulations to Pushpendra. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-29/>

# Amazon Interview | Set 30

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.

This article is compiled by Muthukumar Subramaniam. Many Many congratulations to Muthukumar. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-30/>

# Amazon Interview | Set 31

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.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help.

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<http://www.geeksforgeeks.org/amazon-interview-set-31/>

# Amazon Interview | Set 32

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.   
 I would like to thank GeeksForGeeks Team for being a great help for me.

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<http://www.geeksforgeeks.org/amazon-interview-set-32/>

# Amazon Interview | Set 33

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..

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<http://www.geeksforgeeks.org/amazon-interview-set-33-2/>

# Amazon Interview | Set 34

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](http://geeksquiz.com/)

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.

This article is compiled by Arun Jain. Many Many congratulations to Arun. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 35

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 2  
 / \ / \  
 4 5 6 7  
 \  
 8

**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.

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# Amazon Interview | Set 36

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. 

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# Amazon Interview | Set 37

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

(1)  
 / \  
 (2) (3)  
 \ /  
 (4,5)  
node 4 and 5 are overlapping  
Tree 2  
 (1) (4)  
 / \ \  
 (2) (3) => Rotated one (2) (3)  
 / \ /  
 (4) (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 

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# Amazon Interview | Set 38 (SDE-I)

**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)

o(0,0)  
 / \  
 o(-1,-1) o(1,-1)  
 / \ / \  
o(-2,-2) o(-1,-2) o(0,-2) o(1,-2)

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.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-set-38/>

# Amazon Interview | Set 39 (SDE)

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 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 .

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

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  
6) Complexity?  
  
f(i) = 2\*f(i+1) + 3\*f(i+2)  
For (int i=0; i   
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   
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.

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<http://www.geeksforgeeks.org/amazon-interview-set-40-campus-round-1/>

# Amazon Interview | Set 41 (On–campus)

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.

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# Amazon Interview | Set 42 (On-Campus)

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.

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# Amazon Interview | Set 43 (On-Campus)

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 :P)

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.

This article is contributed by Karthick Raja R. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 44 (For Internship)

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….:)

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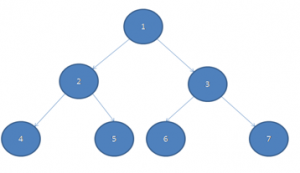
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<http://www.geeksforgeeks.org/amazon-interview-set-44-for-internship/>

# Amazon Interview | Set 45 (For Internship)

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.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/Tree.png)  
 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. 

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<http://www.geeksforgeeks.org/amazon-interview-set-45-internship/>

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

**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

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.

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

**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?

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<http://www.geeksforgeeks.org/amazon-interview-set-47-off-campus-for-sde-1/>

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

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.

This article is compiled by Kumar Vivek Ranjan. Many many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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

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.

Many many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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

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).

5  
 1 7  
 4 3 8 2  
 1

{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.

Many many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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

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

5  
 / \  
 3 7  
 / \ / \  
 1 4 6 8  
 / \ \  
 2 9 10

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.   :

Many many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 52 (For Internship)

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.

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# Amazon Interview | Set 53 (For SDE-1)

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]   
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.

1  
 / \  
 2 6  
 / \ / \  
 3 7 8  
 / /   
 4 12   
 / \ \   
5 9 13  
 \ \  
 10 14  
 \  
 11

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

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# Amazon Interview | Set 54 (For Internship)

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.

A  
 / \  
 B C  
 / \  
 D E

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.

Many Many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 54 (On Campus for SDE)

Hi All, I got the following question for the On-Campus placement process. Hopefully it’ll help you too.

**Screening Test**

Q1. Left View of a tree

Q2. Add three numbers represented as linked lists  
 example  
 n1: 1->2->3  
 n2: 4->5  
 n3: 6->7->8->9  
 sum: 6->9->5->7

**Round 1 (F2F Interview)**

Connect same level nodes without level order traversal. (Code)

Given an array where all numbers but one occurs in pairs, suggest all ways to find the unique number. What if the array was sorted? (Code)

**Round 2 (F2F Interview)**

Print cousins of a given node (Not sibling)

Given a 20 GB file and 2GB RAM, how to parse it and detect where to break it, concepts of memory management

Implement 3 stacks in array, all approaches and code

Deepest left leaf of a binary tree

**Round 3 (F2F Interview)**

Longest path in a tree with just one bend. May or may not start with from the root. (Complete code)

Code for deadlock and how to resolve.

OOPS concepts, polymorphism

**Round 4 (Telephonic Interview)**

Check if a tree is a subtree of another. (Code)

Convert a given number to Roman numbers.

Thanks a lot to the GeeksforGeeks team again. Appreciate the hard work you guys have put. Also a big thanks to all the contributors.

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<http://www.geeksforgeeks.org/amazon-interview-set-54-on-campus-for-sde/>

# Amazon Interview | Set 55 (On-Campus)

**Online Test on InterviewStreet:**  
 18 MCQs (Normal C loop questions, networking, dbms, os, analytical)  
 2 Coding questions  
 1. Check if an undirected graph is a tree or not.  
 2. Given an array of integers, print the 2 elements with least absolute difference.

**Interview Rounds:-**  
 **Round 1:**  
 Tell me about yourself.  
 1. Given a matrix(not necessarily square) in which the elements in a row, as well in a column are sorted. Find a given integer in the matrix.  
 Tell the approach. And then code.  
 2. Given a position where a knight is placed on an nXn chessboard. Find the maximum number of knights that can be placed on the board, so that no 2 knights attack each other.  
 Remember that you need to just give the number of knights, not all their positions. I first could arrange ceil(n\*n/3) knights. Then he asked me find a better solution. Finally I got to ceil(n\*n/2). Then he asked me to code it. Then he asked me to remove the ceil condition(check for even and odd separately).  
 He asked me if I had some question for him. I asked – Amazon strives to be the most costumer centric company on earth. What, as a programmer/developer, do you do to achieve this, because generally, the customer’s problems are an issue for high level managers and planners.

**Round 2:**  
 Started with some questions from my Intern project.  
 1. Given a Binary Tree, replace the data of each node by the sum of data of all its descendent nodes.(Leaf nodes will have 0)  
 2. Given a sorted array of positive integers, find the least missing positive integer. First I gave an O(n) solution. Then he asked me to optimize it. Finally I gave an O(log n) solution.  
 3. Given a stream of numbers, find k random numbers from them. I explained him Reservoir Sampling approach. He asked why this approach works. What is the probability of each number being selected? What is the probability of any number being selected if stream has less than k numbers(its 1).  
 He asked me if I had some question. I said I had one, but I already asked it to previos interviewer. He asked me if I got a satisfactory answer to it. I said the answer was very much satisfactory.

**Round 3 (CS Round):**  
 He asked me if I am comfortable with writing SQL queries. I prefered not to.  
 1. What is an interface? Why it is used? Give an example. What is an abstract class? Why it is used? Give example. Why 2 different concepts of interface and abstract class?  
 2. Do you know about singleton class? What is it? Implement a simple singleton class. I made some mistakes in making attributes static etc. He guided me and finally I corrected all bugs.  
 3. Given a binary tree, where each node has an extra next pointer. Fill the next pointers so that each node’s next pointer points to its next sibling node. First I gave a solution where I would require a map, where each map key will be a level number, and value will be pointer to the last currently accessed node of that level. Then he asked me to do it without space. Finally I gave him a solution without space. I gave a non-recursive approach, and he asked me to code it.

**Round 4(Senior SDE 3 from Seattle Office):**  
 He told me about himself, his team, his work and his team’s work.  
 1. Tell me about one of your challenging project/internship/class assignment.  
 2. Give a situation from your life where you were given a negative feedback, and how did you tackle the situation.  
 3. Explained me a cache situation, where, keys will be in cache, and each key will point to a string. It was LRU cache condition, and I had to implement the LRU cache. Then write a function to retrieve a string, given its key, from this cache. Retrievel should be O(1) (if you give O(n) retrival, he will ask you to make it O(1) ).

Finally got an offer !!  

While you are answering a question, clarify any doubts that come to you mind. Dont take any assumptions by yourself at all.  
 Keep on speaking your approach as you think. Keep speaking, if possible, even when you write code. They want to test if you really know the approach, and not just copying code. All rounds were technical and elimination. The last round has the highest weightage in their procedure. Write clean code, ask for some time if you want.

Thanks a lot to the GeeksForGeeks team for helping with interview preparations! 

Many Many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 56 (Off-Campus)

The most important thing about Amazon interviews is that you need to produce Flawless, Most Optimal solution in the First try itself. Take your time to think, but when you code make sure you Cover every edge case before handing your solution to the interviewer.

**Online Round (90 mins)**

20 MCQ questions spanning Aptitude, basic C/C++ skills  
 2 Coding Questions  
 -> Vertical Sum in binary tree  
 -> Add 2 link lists

**Phone Screen ( PS1 ) ( 45 mins)**  
 Basic questions about OS. Virtual memory, multi-threading, etc.  
 -> Next Greater number for every element. ( Algo + Code )  
 -> Reverse link list ( Algo )  
 -> LCA in Binary Tree ( Algo + Code )

**F2F Interview 1: (45 mins)**  
 -> LCA of K given nodes in a n-ary tree .( Algo + Code )  
 -> Sliding window minimum . ( Algo + Code )  
 Discussion about Internship project .

**F2F Interview 2: ( 60 mins)**  
 Discussion about Internship project .High level Design was to be produced  
 -> Given a boolean 2-D matrix, find the number of unique rows in it.( Algo + Code )  
 I gave 3 diffrent solutions.One of them used Hashing .The interviewer then went into GREAT details of hashing .  
 After a lot of discussion about various Types of hash implementation,pros/cons,uses , he gave me a Scenario for which i needed to build a good hash function.

**F2F Interview 3(Stess Interview) ( 60 mins)**  
 Discussion about Internship project .  
 -> Given a Binary tree and a arbirary node of that tree , find all the nodes at a Distance of K from that Node .Nodes DON’T have parent pointers.( Algo + Code )  
 -> Implement 2 stacks in an array .( Algo + Code ) .  
 Follow up question ->What do we do if we want to change the size of array dynamically.  
 -> Implement 3 stacks in an array .( Algo )  
 -> Implement K stacks in an array .( Algo )

**F2F Interview 4 ( 60 mins )**  
 -> Lot of OS questions . Mutex,semaphore,Deadlock ,Virtual memory , Scheduling algos .  
 Then he gave me a Code, and asked to make it Thread Safe .  
 I had used SQL in my intership project, so was asked basic DBMS questions and SQL queries.  
 SQL query to find maximum in a column, without using aggregate MAX function .

-> Given a binary tree, where every node value is a Digit from 1-9 .Find the sum of all the numbers which are formed from root to leaf paths . (Algo + Code )

6  
 / \  
 3 5  
 / \ \  
 2 5 4   
 / \  
 7 4  
 There are 4 leafs, hence 4 root to leaf paths:  
 Path Number  
 6->3->2 632  
 6->3->5->7 6357  
 6->3->5->4 6354  
 6->5>4 654   
Answer = 632 + 6375 + 6354 + 654 = 13997

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# Amazon Interview | Set 57 (Off-Campus for SDE-1)

Hi geeks, I recently hired for amazon. I just want to share my Interview experience with You all.

Totally 1 Written + 5 F2F

**Written round:**  
 Q1: Convert a sorted integer Array to balanced binary search tree. This is very simple one and I could do it in O(n) time and O(1)extra space.

Q2: Write a Program to reverse every k nodes of singly linked list without using extra space. Constraint: k>=2

**F2F round 1:**  
 Q1: Find the largest element in the sorted rotated integer array in o(log n) time.

Q2: Find Height of a Binary Tree. This is very easy question, so I did quickly.then he move on to next one.

Q3: Find your own method to balance an unbalanced binary tree.(you must not use existing methods like AVL, red black or b trees).  
 Hint: There is no restriction on placing nodes. You can remove any node from any place and put it in any place.  
 I devised an algorithm which will make use of two lists. One list contains nodes far away from the root and this is sorted in decreasing order of levels and left to right if nodes are in same level. Other list contains nodes which are not fully filled. This is sorted increasing order of levels and left to right if nodes are in same level .  
 Remove the first node (listed in list1) and insert as a child of first node in list2.add this node also in list 2. Do this operation until the height of the tree becomes log(n). Interviewer was impressed with this and finished the interview.

**F2F round 2:**  
 Q1: There is a file which contains N words. There may be M anagrams in that file, K words on each anagrams. K>=1, M>=1, N>=1. You need to write an algorithm which will create one list for each anagram with k words and group all M lists with one data structure (This is the main area.we need to think a data structure which will minimize the space and time complexity of word Finding appropriate List and Inserting word).  
 I could do the insertion in O(1) time by keeping track of tail pointer in each list. But finding the appropriate list needs o(n) in case of linked list, o(log(n)) in case of binary search tree. Using hash table, you can do this in o(1), but writing a hash function is difficult and inefficient in terms of time. Then I suggested Trie data structure.with this, we can reduce the time complexity well. But space complexity will be more. I told all the ideas to interviewer. They were much satisfied with this. And moved to next question(without writing code J)

Q2: Find min and max element of an unsorted integer array.  
 Very simple question you can do two pass on the array and find it, but number of comparisons will be o(2n). He asked me to reduce it.  
 I gave an algorithm which will do the same in O((n/2)\*3) which is fairly less than o(2n). They were impressed on my solution and asked weather I have any question .

**F2F round 3: (CS fundamentals and system programming)**  
 Questions were in C++ patterns, Network Programming, Linux, since I did project on networking, Linux I could perform well in this round.

**F2F round 4: (Hiring manager round):**  
 Interviewer was keen on testing cultural fit. Nearly 10 to 15 questions on my previous project,  
 Why amazon?  
 Why you want to leave previous company?  
 What initiative you took in prevous company?  
 How will you manage conflict with your manager?  
 How will you demonstrate ur product to customer?

**F2F round 5: (bar raiser)**  
 This also had cultural fit questions and then a data structure question.  
 Qn: Find the distance between two nodes in a binary tree, no parent pointers are given. I could solve this in post order traversal in o(n) time complexity. He asked me to code in home and send it via mail.

Geeks for geeks is my Wikipedia for interview preparations. Thanks to geeks for geeks.

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# Amazon Interview | Set 58 (On-campus for Software Development Engineer)

I’m in E&CE and I’m sharing my interview experience with Amazon on IIT campus to help you prepare for your interviews. There was online test for 300 students. 25 were selected for interviews. There were 4 back-to-back rounds on the same day. My interview process lasted for around 5 hours and finally I got hired. 

**Round 1:**  
 1. Given 1 billion integers. Find 100 maximum integers. Memory available is insufficient to store 1 billion integers.

2. Given array of N integers ranging from 0 to N-1. Output maximum repeating integer. Use only O(1) memory.

**Round 2:**  
 1. An array of integers is given such that it is first ascending and then descending. Find index of some given integer in that array. Ex. 2,4,6,8,7,5,4,3. Input: 4. Output: 2, 7. Write code on paper.

2. Two sorted arrays are given. Find median when both arrays are merged and sorted. Write pseudo code on paper. Take care of boundary conditions.

**Round 3:**  
 Basic OS, DB concepts.

1. You are given some integers. Propose a data structure to implement “add”, “delete”, “fetch” and “fetch any” operations. All four operations must complete in constant time.

2. There is a B-tree with two type of nodes A and B. Return nth A or nth B while doing inorder traversal in O(1) time. And write pseudo code on paper.

**Round 4 with manager:**  
 There is very huge text file consisting several rows and columns of integers. Memory available is not sufficient to store whole text file. One column can be stored in memory. Sort whole file corresponding to given column keeping all rows unchanged. You cannot make new text file. Write neat code on paper.

**Solution:**  
 **Round 1:**  
 1. Make min heap of first 100 elements. For each remaining elements, if it is greater than root (min) node then remove root node, add that element then heapify. Time = 1 billion \* log(100)

2. Simple. For i = 0 to N-1, A[A[i]%N] += N. Return i with max A[i]. O(n) time.

**Round 2:**  
 1. Find pivot point. O(log n) Binary search in both left and right arrays. O(log n)

2. Compare median of both arrays. Accordingly select right half or left half array. Repeat. O(log n)

**Round 3:**  
 1. Make a hash table and a linked list. When you add an element add it in both hash table and linked list. But in hash table along value caralso store pointer to the same value in linked list. To delete an element find it in hash table, use stored pointer to delete the same element from linked list also. For fetch any operation return head node of linked list. Memory = 2\*N

2. Preprocess in O(n) time: Make two vectors for A and B. Traverse in-order. When you get A add its pointer in vector of A. Same for B.

**Round 4:**  
 Read whole column. Heap sort (saves memory). Now you know old indices and new indices. Shift entire rows from old index to new index. Keep one row in temp storage to avoid overwriting.

**Some tips that may help you:**  
 1. Always be confident for whatever you are saying.  
 2. Listen carefully. Ask doubts until the question is perfectly clear to you.  
 3. Think out loud. Start with obvious approach and then improve upon it.  
 4. They will test your way of approach, thinking process. Don’t give up. Interviewer may give you hint if you are stuck.  
 5. Direct them to ask you about your strong topics.

Many Many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 59 (Off-campus for SDE-1)

I recently went through the Amazon interview process for the post of SDE-1. It was an amazing experience for me.

**Online Round (2 hours):**  
 Q1- Program to rotate a matrix by 90 degree clockwise.

Q2- Program to convert a binary search tree into doubly linked list.

Q3- Program to find a node which is just greater than a given node in a tree.

Q4 –Given a sentence. Find all the characters which are repeated more than 1 time and print them in lexicographical order.

**F2F interview 1(45 minutes):**  
 Q- Given a MXN matrix. To find the number of ways to reach the mth row and nth column cell from 0,0 cell. Find the same if some of the cells are marked as not reachable.  
 First implemented using recursion then through dynamic programming.

Q- Given a linked list like a1-a2-a3-a4-b1-b2-b3-b4. Convert it into a1-b1-a2-b2-a3-b3-a4-b4.

**F2F Interview 2(50 minutes):**  
 Q- Given a sorted array of 0 and 1. Find the first occurrence of 1. Production working code was required. I provided him O(logn) solution. He asked me how it is O(logn). Then I explained him and generated the formula for same. He was convinced finally.

Q- Implement the cache using LRU technique. Production working code was required.

**F2F Interview 3(1.5 hours):**  
 Discussion on my current project. He asked every minute details of my project and made me feel like he knows better than me about my project   
 Then he asked me to implement a data structure for showing the currently visited items by a customer on any website. You will find the same on Amazon website at bottom left side.  
 Program to sort m sorted arrays. I told him that I knew this. So we moved ahead.  
 Data structure to push, pop and find min element in O(1) time.

**F2F Interview 4(45 minutes):**  
 Q- To delete all the nodes from a binary tree that lie on a path whose sum from root to leaf is less than a given value K. Twist was that the node values can be any integer. It may be a negative number.  
 He asked me to find the time complexity and space complexity.  
 I did it using recursion with O(n) time complexity and O(1) space complexity. He said that there is some space being used by my program that I am not taking into consideration. I got his point. Since I was doing it using recursion, So some internal stack space was being used and that would be O(logn)i.e height of tree. That was bit tricky.

Q- Given two sorted arrays. Find the median of the combined array.  
 One thing that you need to keep in mind is that you need to provide them the optimized solution with respect to time and space and don’t forget to consider the corner cases.

After 4 days I got a confirmation call from Amazon 

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# Amazon Interview | Set 60 (For Internship)

Believe me or not before I faced an Amazon interview round I was never sure whether all those gratitude that people usually present to GeeksforGeeks were actually worth. But it is always easier to connect the dots looking backwards and now I can say with assurance that this website really deserves all the applause.

I was recently interviewed for an internship position at Amazon and had to go through a total of 3 rounds i.e. one online followed by two telephonic rounds.

**Online Round**  
 As usual the online round had two coding questions and 20 MCQs. This was a pretty easy round and it’s duration was 90 minutes. The round consisted of questions from various domains like Algorithm, Data Structure, Operating System and Aptitude.

A few days after appearing in this round, I was informed that I have been qualified for the next round.

**First Telephonic Round**  
 I had just three days to prepare for this round and truly speaking, it was my first experience of appearing in any such interview.

This round lasted for almost 60 minutes. It began with my general introduction followed by a brief discussion on my projects. After this, the interviewer asked me four questions.

**Question 1:**  
 Given an array of numbers find all such triplets that satisfy the given condition.

**Condition:**a[i] < a[j] < a[k] where I < j < k.

At first go I thought that it was a pretty easy question but slowly the mist started to clear and I realized how tough it was. The interviewer wanted me to solve it in linear time i.e. O(N)

**Question 2:**  
 Given two trees check if they are mirror images of each other or not.  
 This was a straight forward question and it took me less than 10 minutes to code it.  
 Now the interviewer wanted to test my understanding of operating systems and asked two fairly direct questions, to which I gave my answer based on my understanding (not bookish definition as I did not remember any of those  ).

**Question 3 & 4:**  
 What is semaphore and what do you mean by a deadlock.

After two days I got a call from the HR informing me I have been selected for the next round. Now it was the time for the last and the decisive round.

**Second Telephonic Round**

For this round I had slightly more time than the last, due to the fact that the weekend fell in between.The interviewer was very very cool and helping this time, something which I kept at the last in my list of probable things that can happen during an interview. Duration of this round was around 90 minutes.

This time I had to face three technical questions and one general question on Amazon.

**Question 1:**  
 Given a BST, replace each node with the sum of the values of all the nodes that are greater than that node. Only constraint being that I was not allowed to use any global or static variable.  
 Although I panicked a bit and made few mistakes, I got through.

**Question 2:**  
 Given an array of numbers find the maximum count of duplets and triplets such that there sum is a multiple of three. Number that has appeared once can’t be included anywhere else.  
 I solved this question using a property of modulus.

**Question 3:**  
 Given the stock prices of 10 days find the best possible buy sell pair.  
 For this question I started with a O(N2) solution but then finally managed to reduce it to O(N) solution with constant space complexity.

I was also asked few questions on Amazon like what are domains in which Amazon deals.

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<http://www.geeksforgeeks.org/amazon-interview-set-60-internship/>

# Amazon Interview | Set 61 (For Internship)

Hello geeks, Last month I appeared for the **Internship Interview of Amazon**.  
 What my personal experience says is that never try to jump to the right solution straight-away, instead take your time and **think progressively** about the possible solution to the given problem.  
 **Check for boundary test-cases** carefully and also don’t remain completely blank during your conversation with interviewer but keep on telling him about the **tentative solutions** that are coming to your mind.

My entire process consists of **3 rounds:**

1. Online Round.  
 2. 1st Telephonic Interview  
 3. 2nd Telephonic Interview

**Round 1:**  
 It was an online round consisting of 20 Multiple Choice Questions (from C language, Operating Systems, Data Structures and Algorithms and Software Development Concepts) and 2 Coding Questions:

1. Given 2 linked lists constructed another linked list containing the sum of those 2 linked lists. e.g Given :  1 -> 2 -> 3 and 4 -> 5 -> 6 Ans: 5 -> 7 -> 9

2. Find the Vertical sum of the given Binary Tree.

**Round 2 (Telephonic):**  
 The duration of telephonic Conversation was about 60 minutes and the Interviewer asked me 2 coding questions:

1. Given an array of +ve as well as -ve numbers, find out whether it is possible or not to convert it to 0 by adding/subtracting operations on all the elements.

e.g arr[]={1,2,3}  
 YES (1+2-3)

arr[]={3,6,2}  
 3+6-2 != 0  
 3-6-2 !=0  
 -3-6-2 !=0  
 -3-6+2 !=0  
 -3+6-2 !=0  
 -3+6+2 !=0  
 3-6+2 !=0  
 3+6+2 !=0

Hence ans= NO

2. Given a binary Tree where the structure of each node contains an extra “next” pointer (initially all NULL), modify the binary tree such that all the nodes at the same level gets connected by utilizing these given extra pointers.

The interviewer also asked me to write the code for the same.

**Round 2 (Telephonic):**  
 The duration of telephonic Conversation was about 90 minutes and the Interviewer asked me 2 coding questions:

1. Write a code to find the **Diameter** of the given a binary tree  
 Firstly I gave the solution which has complexity O(n^2) then he asked me to optimize it so finally I did it in O(n).

2. Given a number design the algorithm to find the next greater number which contains exactly same digits. e.g. n= 123 next greater with same digits = 132  
 The number can be very large so its better to consider it as a sequence of characters.

I was also asked to write the code for the same.

I had a very great time preparing for the interview and got to learn a lot of new concepts.  
 I am really very thankful to **GeeksForGeeks** for being the primary source of my preparation and believe me guys this website is just **awesome**.

And ya forgot to mention I finally got the confirmed offer for Internship at Amazon  

Many Many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 62 (For SDE-1)

I recently went through the Amazon interview process for the post of SDE-1.

**Round 1 (Written)**  
 1. Given an array, output an array where every index conains nearest greatest element to that element on right side.  
 2. Program to convert sorted array to Binary Search Tree  
 3. Find first non-repeating character in String  
 ex: geeksforgeeks: f  
 geeksforgeeksFirst:o

**Round 2 (F2F)**  
 1. Given linked list as a-x-b-y-c-z  
 output it as a-b-c-z-y-x  
 that is reverse alternate element and append to end of list

2. Output nearest number greater than given number such that output is palindrome  
 ex: 121:131  
 900:909  
 99:101

**Round 3 (F2F)**  
 1. Vertical Sum in Tree( I told him I know the solution, he proceeded further)  
 2. Given stream of Strings find top 5 words with maximum frequency or count  
 3. Given 2 nodes in Binary Tree find distance between them

**Round 4 (F2F with hiring manager)**  
 1. Projects done so far, HR questions  
 2. Design Linkedin and find till 2nd level connections and path between 2 connection  
 for ex: if A is friend of B which is friend of C  
 print between A and C A-B-C  
 3. Programming language: Java  
 About synchronisation, serialization, transient and volatile keyword, Singleton Class

**Round 5 (Bar Raiser)**  
 1. Count Inversion in array that is if i a[j]  
 Told the solution nlogn of divide and conquer. He asked another solution, then told by inserting in BST and whenever node goes to left side then adding 1 and number of children on right side . We have to keep track of count of right subtree in every node

**Round 6 (F2F)**  
 1. HR questions (Why leaving company, projects, SWOT)  
 2. Program to check for mirror tree  
 3. Data Structure so that push, pop, getmin, getmax O(1) (using 3 stacks)  
 4. Data Structure so that push, pop, pop min, pop max  
 Told Solution till O(logn) by using min heap, max heap with pointers to doubly linked list nodes

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# Amazon Interview | Set 63 (For SDE-1)

I have a total experience of two years. I am sharing my interview experience with Amazon. This is for SDE1 Amazon.

A very big thanks to whole team of geeks for geeks. It is because of them only that I was able to make Amazon and get a job in my dream company. Otherwise it was impossible for me.

Online round: (1hr, working code required)

* Given coin array and a sum K, find min. number of required coin to make sum K. (DP Question)
* Two rectangles are given in two D space. Find if these are overlapping or not
* KMP for pattern searching

After two days I got the call to come Amazon Bangalore ofc to attend next rounds:

1st Round:

* First occurrence of duplicate char  in a char array.
* Merge two sorted array of n and n+m size
* Zig-zag traversal of tree

2nd Round (Hiring Manager, full explanation in white board):

* Tell me about one of your best project, deep drive J
* Count the words in a file (simple one)
* Design parking system.

3rd Round: (one or two DS ques I forgot)

* Reverse every k-element in  a linked list
* Check if two tree are mirror tree
* Find longest palindrome in a string
* Find sum K from an unsorted array which have both –ive & +ive numbers.
* Full explanation about tries (search, insert, traversal, delet)
* Full browser working
* Lock variable and their implementation (OS)
* What is hashing, if any hash function mapping tow inputs to one output then how to handle that scenario at the time of retrieval, you can’t change hash function.

After one week I got the call from HR for my BR round.

4th Round (BR Round, full on white board):

* Cultural fit questions: tell me about yourself, why you are looking for change, what innovative you did in last two year (I had already preparation for all these type of questions) J
* Lots of discussion happened about my current project.
* Given two string remove the characters of one string from another string  
   o   Another variation he asked: Given two string remove the characters of one string(**having duplicate characters**) from another string
* o   One more variation he asked: Given two string remove the characters of one string(**having duplicate characters**) from another string **from right to left.**
* Given one string, print all the anagrams of this string from a given file which contains lots of strings.  
   o   Another variation of this he asked: Given **group of string,** print all the anagrams of all given string from the file of strings.
* After that he asked one more culture fit question

*He was very happy after seeing my explanationsJ* *J*

Many Many congratulations to the author. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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# Amazon Interview | Set 64 (Off-Campus for SDE)

I am sharing my off campus SDE interview experience with Amazon.

**Online round: (1hr)**

1. Given coin array and a sum K, find min. number of required coin to make sum K.
2. Two rectangles are given in two D space. Find if these are overlapping or not
3. KMP for pattern searching

After two days I got the call to come Amazon office for F2F interviews:

**1st Round:**

1. Program to construct binary tree from its inorder and preorder traversal. (algo+code)
2. Reverse every k-element in a linked list(algo+code)

**2nd Round:**

1. Tell me about one of your best project in detail.
2. Design Restaurant reservation system.

**3rd Round:**

1. Given a binary search tree of n nodes, find all the pair of  nodes whose sum is equal to a given number k in O(n) time and constant space.(algo+code)
2. Given a function “f” in which 0 occurs with probability 0.4 and 1 occurs with probability 0.6. Using function “f” deduce a new function “f1” such that both 0 and 1 occurs with probability 0.5
3. Given a matrtix, find the maximum sum subarray in it.(algo+code)

After one week I got the call from HR for my BR round.

**4th Round (BR Round):**

1. Tell me about yourself.
2. Why are you looking for change?
3. How will you handle conflict with your manager?
4. What is the most challenging work done by you  in your current company?
5. Lots of discussion happened about current company’s project.
6. Given a number N, find the smallest 3 digits number  such that product of its digits is equal to N. ( algo+ optimal code)

In all the rounds, the most optimal production quality working code was required and if you get stuck, then they will give you HINTS but don’t consider this in your favor!

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# Amazon Interview | Set 65 (Off-Campus for SDE-2)

My experience for Amazon’s Software Development Engineer-2

**1st Round (Face-to-Face)**  
 **1.** Design ATM  
 **2.** Design Car Service center  
 —- Deep dive into design and focus on specific modue called ‘Service’  
 —- Supervisor should be able to allot a Best Engineer to Service customer request, How do you code to get best engineer to fix the car service request.

**2nd Round (Face-to-Face)**  
 **1.** Write a program to get all list of nodes without siblings in Binary tree  
 **2.** How do you implement ‘Car service center’ application to achieve Reliability, Scalable and Consistent in distributed environment.

**3rd Round (Face-to-Face)**  
 **1.** Some behavioural Questions  
 **2.** Core java Q: Why do we need equals method ? Can we check equality using hashcode method. Difference b/w them ?.  
 **3.** Get all nodes K distance away from leaf nodes. I could able to tell him my idea, but I couldn’t able to come up with program with in given time.

**4th Round (Face-to-Face)**  
 **1.** Specific questions on current working project.  
 **2.** Implement my own Connection pooling  
 **3.** Given a linked list, write a function to reverse every k nodes. Initially I told him solution with help of Stack , then he asked without using extra space, With his clue, I could able to tell him using recursive logic to solve it.  
 Inputs: 1->2->3->4->5->6->7->8->NULL and k = 3  
 Output: 3->2->1->6->5->4->8->7->NULL.

**5th Round (Face-to-Face)**  
 **1.** Given a string, find the longest substring which is palindrome. For example, if the given string is “forgeeksskeegfor”, the output should be “geeksskeeg”. I have seen this question , but never thought about solution.  
 Same question i got in interview, I was very happy to get solution, interview asked me optimize further. I could fix 1 improvement and he suggested 1 improvement.  
 **2.** Identify all possble entities/domain objects in Cricket. Went little deep.  
 **3.** Given Channel, Program and TRP ratings, How do you consume those at server side,  
 and what do you do to retrieve specific data like 1Get all programs in given channel where TRP is > 10′.  
 **4.** Some behavioral Questions

Overall it was great experience, Myself satisfied with my performance in all rounds expect 3rd round :(.

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# Amazon Interview | Set 66 (For SDE)

**A F2F**  
 1. Min stack problem (algo+code)

2. filling next pointer in tree but in zig-zag order (algo+code)

**B Hiring manager**  
 1. A big file (some TB’s) containing custid, page and time stamp, find out the repreating customer( the one who visits after 24 hrs)(algo)

2. In a paragraphs tell the frequency of the words(algo)

3. A sequence of array, print the kth largest number(algo+code)

**C F2F**  
 1. Left view of a tree (algo+code)

2. Swap two node pointers in a singly linked list(algo+code)

**D F2F**  
 1. Given some sets of people who fight against each other. They are represented as graph. if a link exists between A and B, the it means that A and B are fighting against each other. Likewise there are some more links. The question was to divide the nodes into groups such that no person in a group fight with another member in that group. (More of bipartite graph) find the groups (algo)

2. A singly linked list, find the kth element from the last. The question was further modified to not to process a node more than once. (algo)

**E Bar raiser**  
 1. Questions on projects, what is it, what did you do (deep diving)

2. Situation that has to miss deadline

3. Any situation encountered with performance issues

4. Any situation where you need to convince your team mates

5. Any situation where you can see there are some improvements required and proposed

6. There is a large file( 1TB) containing braces. Question is to check for their balance. I said will use a counter, will increment on an open brace and decrement on an close brace. If counter goes negative or counter is non zero at the end of the file, braces are not balanced. Otherwise balanced. Followup question was to make this process parallel (meaning to see if this problem can be solved through parallelism, like dividing the the problem into sub problem….) Remember the file is very large.

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# Amazon Interview | Set 67 (For SDE-1)

1) Round 1 telephone interview – implement division without using division operator in log(n) time.  
 solution: use bitwise shifting

2) Round 2 telephone interview – write a program to buy and sell stocks to maximize profit, can only do 1 action per day i.e. buy or sell.  
 solution: I used 2 pointers to keep track of best buy and sell rates. I implemented it in O(n) time. He was happy with the solution.

After a few days I got a call from the recruiter saying the team was very happy with my interviews and wanted to meet with me in person.

I had to actually reschedule my on-site interview as I couldn’t locate the office since it was not locatable on Google maps!!

I got in the office in Toronto. I was given a visitor pass and escorted to a meeting area where the interviews took place.

3) F2F(HR round)  
 This was easy, the interviewer asked basic questions about my background and what made me choose computer science. I talked about my favorite project and she answered some my questions.

4) F2F(Director) he wanted me to do BFS search. Given a level, child index return the child node for a binary tree. I gave him a inorder search instead, he was okay with the solution.

5) F2F(SDE) this is when things started to get tough. He wanted me to design a library reservation system. He wanted me to explain him a design and draw some diagrams and then implement the classes.  
 We didn’t have enough time to do all of it. He wanted to know what data structure I would use to perform searches for books. I choose LinkedHashMap because it allows O(1) lookup and O(1) insertion.

6) F2F(SDE) He wanted me to build a boggle game. This is where I got a little mixed up with some java and C# syntax and he was not too impressed. I tried to write the algorithm using 2 for loops and he gave me some hints as to how to implement it.

7) F2F(SDE) Given a list of words, find anagrams. This was easy enough to implement. He asked runtime in the end.

The interviewers communicated with you all the time, its not like you go in an exam and quietly write what you have memorized. There is lots of pressure and lots of explaining to do as you write the code.  
 All in all it was a great experience. The guys were cool and fun to interview with.

Geeksforgeeks was a tremendous help towards the interview.

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# Amazon Interview | Set 68 (For SDE-1)

I went through the Amazon interview process for SDE-1, I didn’t make it past the 3rd F2F round.

**Online Round:**  
 1. Find if a given string contains duplicates  
 2. Given a BST, find the maximum N elements of the tree  
 3. Given a BST, convert it into Doubly Linked List  
 4. Rotate a 2-D Matrix by 90 degrees

**Telephonic Interview:**  
 1. Given an array of integers (+ve and -ve), give a contiguous set of numbers that add to 1  
 Eg. 4 3 5 -3 -1 2 -3 10 2  
 Ans: 5 -3 -1 2 -3

2. Check if a given tree is a BST or not

3. In a 2-D Matrix with the following properties:  
     i. Contains only 1s and 0s  
     ii. Every Row is sorted  
 Find the row with maximum zeroes.

**F2F:**  
 **Round 1:**

1. Print all the cycles in a directed graph

2. Given an unsorted array, assign every element to its immediate larger number after the current number, assign to -1 if no such number exists  
 Eg. 3 1 2 5 9 4 8 should be converted to  
 5 2 5 9 -1 8 -1

**Round 2:**  
 1. In a 2 D array where every row and column are sorted, give the nth smallest element

2. In a Binary tree, every element must contain the sum of its sub-trees  
 Follow up question: how would you solve this if you can ONLY increment the value of a node  
 Eg. If a node’s value is 20 and its sub-tree sum is 10, the node’s value can’t be set to 10 because you can only increment

3. Given n, find the smallest number for which product of the digits is n, if no such number exists, print -1  
 Note: Digits can only be split as single digits, i.e., 132 can’t considered as 1 \* 32 or 13 \* 2, it would only be 1 \* 3 \* 2  
 Eg. Answer for 36 would be 49

**Round 3:**  
 1. Convert a Binary tree into another binary tree whose in-order traversal gives a sorted list  
 This has to be done in-place

Eg.

1  
 2 3  
 4 5 6 7  
  
should be converted into  
  
 4  
 2 6  
 1 3 5 7

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# Amazon Interview | Set 69 (For SDE-1)

**Online Coding Round:**

1. Find if a given string contains duplicates
2. Given a BST, find the maximum N elements of the tree
3. Given a BST, convert it into Doubly Linked List
4. Rotate a 2-D Matrix by 90 degrees

**Telephonic Interview 1:**

1. Sliding Window Problem: Given a larger integer buffer/array (say size, x), now given a window size (say, n) and a number (say, k). Windows starts from the 1st element and keeps shifting right by one element. The objective is to find the minimum k numbers present in each window.
2. Given a binary tree, each node having an integer data, the objective is to create a new Doubly Linked List using this binary such that each node in DLL has vertical sum of nodes in binary tree. The order of nodes in DLL shall be left to right as that of binary tree’s vertical nodes i.e., leftmost vertical sum shall be 1st node in DLL and the rightmost vertical sum shall be the last node in DLL.

**Telephonic Interview 2:**

1. Given the root of the binary tree and a pointer to any random node in that tree, the objective is to print all the nodes at ‘k’ distance from the given random node.

**Face to Face:**

***Note*:** Time and space complexity were discussed in each of the following questions. And for each question I was asked to optimize the algorithm and later write the working code for it.Also in each round the current project was discussed.

**Round 1:**

1. Given a matrix (m\*n), source (0, 0) & destination (m-1, n-1) (i.e. last cell), Find out total number of ways to reach the destination from the source.
2. Given a binary tree, defining a term “complete path sum” as, sum of values of nodes lying in a path from root to the leaf; Now given a value ‘k’, we have to find the k-heavy path and prune the binary tree i.e. prune/delete nodes for which complete path sum is smaller than k.

**Round 2 (Manager’s Round):**

A thorough discussion on an issue: If I am an owner of company which is selling some product. So, how shall I store my data in Database such that when any analyst comes and asks for any information then I could provide him most precise values. It mainly consisted which data should be stored and how it should be stored.

1. Given two sorted arrays, create a final sorted array. Later, the problem was extended saying that, now we have ‘m’ number of sorted arrays each of size ‘n’, now efficiently create a final array. A lot of discussion was done on complexity of the approach (both time and space).

**Round 3:**

1. Given a binary tree, where cost of travelling to the left child is ‘1’ and same for the right child is ‘2’. Now, given the root of the tree and a value ‘k’, find the total number of nodes that are at a distance/cost of ‘k’ from the root.
2. Given an unsorted integer (positive values only) array of size ‘n’, we can form a group of two or three, the group should be such that the sum of all elements in that group is a multiple of 3. Find the maximum number of groups that can be generated in this way.
3. Given an integer array, find minimum number of jumps to reach the end of the array.  
    <http://www.geeksforgeeks.org/minimum-number-of-jumps-to-reach-end-of-a-given-array/>

**Round 4:**

1. Given a BST, convert it into a Doubly Linked List in place. *NOTE*: We don’t have to create a new data structure i.e. we have to modify the links/pointers in given BST.
2. Question was framed this way: Given street of houses (a row of houses), each house having some amount of money kept inside; now there is a thief who is going to steal this money but he has a constraint/rule that he cannot steal/rob two adjacent houses. Find the maximum money he can rob.

*NOTE*: I didn’t face any HR round, all though in each rounds I was asked about the reason for the change.

In all it was a great experience, and interviewers were really cool and gave a plenty of time to think and code, sometimes suggested/hinted if I got stuck.

GeeksforGeeks has been extremely helpful for me in preparing.

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# Amazon Interview | Set 70 (On-Campus For Internship)

**Online Round Coding Question:**

Q1. Given a float number 7.64, convert it into the string WITHOUT using any inbuilt function/library.  
 for eg:  
 input  
 float no.: 7.64  
 output  
 string: 7.64

Q2. Given the inorder and preorder traversals of a Binary Tree, output the postorder traversal of it.  
 for eg:  
 input:  
 Inorder: 7, 8, 4, 1, 6, 2, 5  
 Preorder: 1, 4, 7, 8, 2, 6, 4  
 output:  
 Postorder: 8, 7, 4, 6, 5, 2, 1

**Round 1 written:**  
 Q1. Given a string find the length of longest substring which has none of its character repeated?  
 for eg:  
 i/p string:  
 abcabcbb  
 length of longest substring with no repeating charcters: 3 (abc)

Q2. Given a link list with right pointers and each element of the list has a down link contains another link list with down pointers as:

5 -> 7 -> 9 -> 18  
 | | | |  
10 6 14 20  
 | | | |  
11 8 19 22  
 | | |  
12 13 24  
 |   
15

each right and down list are sorted.  
 Write a function flatten() which flattens this link list to a single link list with all the elements in sorted order as:  
 5->6->7->8->9->10->11->12->13->14->15->18->19->20->22->24  
   
 **PI Round 1:**  
 The interview started with discussions and questioning about the internship project and other projects mentioned in my Resume.  
 After the discussions about projects interviewer asked a question on string the question was:

Q1. A string of length n and an integer m was given, give an algo. to rotate the string counter clockwise by m. I was asked to give all the check conditions for input m.  
 Then the interviewer asked me to write a code for the same with a strict guideline that there should not be any mistake in the code ;).

Q2. After this he asked me about heap, min and max heap, insertion and deletion in a heap. He asked me to prove that the time complexity of inserting n elements in a heap.  
 At-least he asked about the uses of heap data structure and other data structure which are implemented using heap.

**PI Round 2:**  
 Q1) What is the difference b/w abstract and interface class?  
 Q2) Write a program to create single thread and print “Hello World”, stating all the arguments of createThread function?  
 Q3) What is a deadlock and what are the condition necessary for the deadlock to occur?  
 Q4) What is a cache memory and how it is implemented?  
 Q5) Explain LRU, FIFO and other page replacement algorithms?  
 Q6) Write a code to implement LRU cache and then implement full cache memory?

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# Amazon Interview | Set 71 (For SDE-2)

Recruitment Drive – Delhi (22 March 2014)  
 Position SDE-2

**1st Round – Coding and Algo (50 Minutes)**

1. Find In order predecessor in BST.  
 2. Find Nodes which are at “K” distance from given node.

Interview asked to explain logic and write full code with all boundary conditions.

**2nd Round – Design Round (50 Mins)**

1. Asked about abstract classes and abstract class there uses and where they have to used.

Asked me to design online cab booking system for amazon. Then asked me to design High Level diagram for it.

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**3rd Round – Coding and Algo Round ( 1 Hour)**

1. Asked to explain how to check Binary tree is BST? then asked me to write whole code of it.

2. Then asked me about assembly line problem. <http://www.geeksforgeeks.org/dynamic-programming-set-34-assembly-line-scheduling/>

3. Then asked me to solve Knapsack Problem <http://www.geeksforgeeks.org/dynamic-programming-set-10-0-1-knapsack-problem/>

**4th Round – Manager Round (45 Min)**

Asked me about my experience with current company and details of my project  
 Then asked about singleton pattern.

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<http://www.geeksforgeeks.org/amazon-interview-set-71-sde-2/>

# Amazon Interview | Set 72 (Off campus for SDE-1)

Amazon Interview (Off campus for SDE-1)  
 Experience: 8 months   
 Interview Process – 2 (telephonic) + 3 (f2f – Bangalore) + 1 bar raiser (telephonic)

**Telephonic 1 (25 minutes only)**  
 Q1. Two strings s1 and s2 are given; find a minimal length substring in s1 which does not contain s2 as a substring. (Do include all edge cases)  
 Q2. Swap all nodes of a linked list with their next nodes.

**Telephonic 2 (65 -70 minutes)**  
 Q1. An integer array of size n is A[] given, find the three numbers s.t. A[i] > A[j] > A[k] and I Q2. An array of integers is given, trim the array such that 2\*min > max. min and max are the minimum and maximum elements of the array. You can remove elements either from start or from end of the array if above condition does not meet. No of removals should be minimum. (algo + code)  
 For example a, b, c, d, e f are the elements of array, c is the min num and e is max no  
 condition 2\*c > e is true then we are done but if false then remove either from start i.e. a,b,c or from end i.e. e, f such that new min or max would satisfy the condition and removals should be minimum.  
 Q3. A sorted array of integers and a number K is given, find the closet number to K. (algo only)

**F2F 1 (60 minutes)**  
 Brief introduction about my self and my work experience in current company  
 Q1. Equilibrium Point in an integer array (sum of left side elements should be equal to sum of right hand side elements)  
 Q2. Extend above for multiplication (multiplication of left side elements equal to multiplication of right side elements)  
 (special case of Zero and some discussion on arithmetic exception and range bound errors)

**F2F 2 (60 – 65 minutes)**  
 Some general introductory questions; why are looking for a change and work experience.  
 Q1. For a given number K, print all pairs of valid parenthesis combination and return the total count of such combinations.  
 Q2. There are n balls kept on a table and connected in random fashion but there is no cycle (no back edge). Write the code to select a ball such that after lifting the whole structure from that ball height will be minimum. (algo+code+ mathematical proof of correctness)  
 Q3. Difference b/w http and https.  
 Q4. Suppose you are handling Amazon website and you have 10 MB size home page. Optimize the homepage for a customer who has 100 kbps internet connection.  
 Further he asked for the customer who has 100 mbps internet connection.

**F2F 3 (with Hiring manager, 80-90 minutes)**  
 Lots of discussion about current project. He will ask you everything from bottom level to your contribution.  
 Q1. Implement memcpy (\*src,\*target) function.  
 Q2. Reverse contents of a linked list.  
 Q3. I code in java so lots of question on oops and java like swing and awt difference , vector and array list difference , interface and abstract classes.  
 Q4. Client and server code in chat window, background process in server and network, networking layers.  
 Q5. Process and threads and code for thread safe situation (take an example and explain)

**Bar raiser (Telephonic one hr)**  
 Hr Question like biggest challenge so far, projects, why are you looking for a change, why amazon, biggest mistake.  
 Q1. Given flat files (for an entire year, 1 per day) of train schedules (arrival and departure times at a given station) find Min platforms required to accommodate the trains in that station.(algo only)  
 Q2. I want to write a ransom note. But I don’t want to write it by hand, I’m going to cut letters out of a magazine. How can I tell if the magazine has enough of the right words to spell out the note I want to write? Let’s assume we have a way to digitize the text of the magazine. (algo only )  
 I asked him about Amazon kindle and Amazon instant video. Show him that you know lot about amazon.  
 Advice for Amazon: except from all data structure, read Trie data structure very well and how to process big data.

Next day I got call from HR tht I am Hired  

Thanks a lot to geeksforgeeks team.

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# Amazon Interview | Set 73 (For SDE-1)

I have been interviewed for SDE1 by amazon. Here are the questions.

**1st Round – Online Coding**  
 1. Contiguous elements in an array whose sum is k.  
 2. Convert sorted array to binary search tree.

**2nd Round – Telephonic**  
 1. Implement stack with Push, Pop, GetMin and GetMax in constant time. Algo + Code  
 2. Given a matrix, sorted both horizontally and vertically, algo and code for finding an element in it. Algo  
 3. Given a stream of characters, convert it to a sentence with valid words. Assume you have a function IsWord which returns true if the passed string is a word. He asked me to write code and mail him. Algo + Code  
 Ex: Iamgoodboy – I am good boy

**3rd Round – Telephonic**  
 1. Given an array of characters, find the longest continuous non-repeating sequence of characters. Algo + Code  
 Ex: aabcdefdghiajk – efdghiajk  
 I have given a hash based solution, so he asked me to write a custom hashfunction and how to handle collisions.  
 2. Find the next largest palindrome number of the given number. Algo + Code  
 Ex: 120 -121, 123 – 131

**4th Round – InHouse technical round**  
 1. Find the mirror image of a binary tree. Algo + Code  
 2. Given a string, find the largest repetitive sequence. Algo + Code  
 Ex: abcdefbcd – bcd, banana – ana

**5th Round – InHouse technical round**  
 1. Given a string, remove ‘a’, ‘bc’ from the string and print the  
 result. Algo + Code  
 Ex: asdbc – sd  
 2. You will be receiving an infinite sequence of numbers continuously  
 and at any particular moment find the 10 largest ten numbers received  
 till now. Algo

**6th Round – Bar raiser round**  
 1. Given a graph, find the nodes which are at less than k distance  
 from the given node.  
 Continuation: find all the nodes which are less than k distance from m  
 nodes. Algo + Code  
 2. Implement a queue using an array. All base conditions. Code  
 3. Given a very big array of millions of integers, find sum of all the elements.  
 Parallel processing and threads is the answer. Threads concept,  
 synchronisation and so many of it.  
 4. OS concepts – virtual memory, paging, process states, paging algos.  
 5. In detailed explanation of projects done till date.

**7th Round – Manager Round**  
 Asked dilemma situation. Any process development work, work experience and all.

geeksforgeeks helped me to refresh all kinds of topics. Thank you.

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# Amazon Interview | Set 74

**Phone Interview:**  
 1) Given a 2D matrix where every row is sorted, give the index of row which has maximum number of one’s  
 2) Given a Binary tree, print its every level in a new line.

**Face to Face Interview (Round 1):**  
 1) you have an array which has a set of positive and negative numbers, print all the subset sum which is equal to 0.

eg 2, 1, -1, 0, 2, -1, -1  
o/p: 1, -1  
 1, -1, 0  
 0  
 2, -1, -1

2) How do you check whether a binary tree is a binary search tree.

**Face to Face Interview (Round 2):**  
 1) you have a billion numbers how do get kth top elements  
 2) given a number n, print all pairs of valid parenthesis

eg: n=2 -> (()), ()()  
 n=3 -> ()()(), (())(),()(()), ((()))

I did not clear after this round, I hope this helps others.

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# Amazon Interview | Set 75 (For SDE-1)

I am currently in my 8th semester . I recently attended the off campus drive for SDE1 at Amazon. Here’s my journey.

**Round 1:- (Written)**  
 This was a written round . It was hosted on interview street.  
 It was a 90 minutes test with 20 mcq and 2 codes  
 1> Return the longest palindromic substring in a string  
 2> Count the number of 2’s in all number from 0 to n .  
 Mcq’s were based on ds algo,operating system and maths.

After two days I got a call from the hr that I have cleared the written and a phonescreen is to be scheduled.

**Round 2:- (Phone screen 1)**  
 This was supposed to be a 1 hour round. The interviewer shared a collabedit link.

1> Divide an array into 2 subarrays such that the absolute difference of their sum is minimum. It was then extended to divide into two subsequences .

2> Convert a sorted array to a balanced binary search tree.

3> Convert a linkedlist with positive and negative integers into a list with first all negative integers, then positive. order amongst negative and positive numbers to be maintained .

Generally if first phonescreen is convincing the next step is direct face to face interview , else one has to go through another phonescreen . I had one phonescreen only . After a month i was called for inhouse interviews . All arrangements were made by them .

**Round 3 :- (Face to Face 1)**  
 1> Define a BST. Now check if a binary tree is a BST  
 2> Given an array of size n, and an integer k. find minimum number in every subarray of size k  
 3> Given n non-negative integers representing an elevation map where the width of each bar is 1, compute how much water it is able to trap after raining  
 4> Given an array find all triplets whose sum is equal to a given number k

**Round 4 :- (Face to Face 2)**  
 1> Find the diameter of a tree.  
 2> Print the diameter of a binary tree . (U have only left and right pointers)  
 3> Assembly scheduling problem (Dynamic Programming paradigm)

**Round 5 :- (Face to Face 3)**  
 1> How to check if two sets are disjoint ?  
 2> How to implement hashing for a set .  
 3> Given n sets , give the minimal number of sets which must be removed so that the remaining sets are all disjoint (Variation of set packing problem)  
 The interviewer was interested in some greedy heuristic as he knew its an np complete problem and no solution can be better than exponential  
 4> You are given a matrix of 1’s and 0’s . The property is that  
 every row of matrix is sorted in descending order . Return row with maximum number of 0’s

**Round 6 :- (With senior manager)**  
 Interview started with detailed discussion of projects.  
 1> Implement lastindexofastring(String s1,String s2) . If s2 is present multiple times return the last index of s2 in s1 , else return -1.  
 2> Given a paragraph of text, write a program to find the first shortest sub-segment that contains each of the given k words at least once. A segment is said to be shorter than other if it contains less number of words.

The interviewer then asked me if i had done something on multithreading . As i was not very confident so i said no and he dint go further .  
 He then asked me what is my biggest regret in my student life in college .

Amazon hr’s were extremely helpful. After 3 days I got a confirmation call that I was hired. Geeksforgeeks has been instrumental in helping a lot of people to land up in good companies. Keep up the good work 

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<http://www.geeksforgeeks.org/amazon-interview-set-75-sde-1/>

# Amazon Interview | Set 76 (For SDE-1)

Hello Guys, I was recently interviewed by Amazon for SDE-1 position. Following is my interview experience.

**Round-1 (Written on InterviewStreet)**  
 1. Rotate a N\*M matrix 90 degrees clockwise  
 2. Given a string find the repeated characters and print them in lexicographical order. e.g i/p string- “ABCCAD” o/p-“AC”  
 3. Given a binary tree, find the k-th largest element  
 4. Convert Binary tree to DLL

**Round 2 (Telephonic)**  
 1. Given an MxN array, in which the rows are sorted. Need to sort the complete array

**Round 3 (F2F)**  
 1. Spiral Level order traversal of Binary tree  
 2. Given a huge file 100 million integers. He further divided the file  
 to 100 files with 1 million integers each. Each file is sorted. Find the efficient way to find smallest ‘m’ integers. Note ‘m’ is very less in comparison to a million  
 3. Given sorted & rotated array find the index of given integer

**Round 4 (F2F)**  
 1. Given a Binary Tree and a sum k.Print all the paths with sum = k. Path can or cannot start with root  
 2. Reverse k elements of linked list  
 3. Given a 2D array find the maximum sum rectangle  
 4. Given a list of n mp3 songs. Play them randomly. No song should repeat until all the others are played.

**Round 5 (F2F with Development Manager)**  
 1. Tell me about yourself and the projects done in previous company. A discussion on those projects followed.  
 2. Why do you want to leave your previous company  
 3. Given a binary tree

1  
 / \  
 2 3  
 / \ / \  
 4 5 6  
 / \ / \ / \  
 7 8 9 10   
 Needed to connect the nodes vertically  
 1  
 / | \  
 2 | 3  
 / | \ | / | \  
 4 | 5 | 6  
 / \ | / \ | / \  
 7 8 9 10   
Assume each tree node has an additional pointer   
(struct node\* vertical)

**Round 6 (F2F)**  
 1. Given stock price of Amazon for some consecutive days. Need to find the maximum span of each day’s stock price. Span is the amount of days before the given day where the stock price is less than that of given day

E.g i/p = {2,4,6,9,5,1}  
 o/p= { -1,1,2,3,2,-1}

2. Given a Binary tree each node should contain the sum of left and right subtrees. Leaf nodes will become 0 in the resulting tree.

**Round 7 (F2F with Project Development Manager)**  
 1. Tell me something about yourself  
 2. Tell me about your previous company and projects  
 3. Why do you want to leave the previous company in such a small time.

Finally got the offer after few days   
 Tips:- Be clear to the interviewer, the are quite helpful. Try to discuss the various approaches that come up in your mind if you are struck somewhere.  
 All the best.!!

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# Amazon Interview | Set 77 (Off-Campus For SDE-1)

Amazon SDE1 Off campus (1.5yrs experienced)

**Written Round**

1. Given an array in which elements are first increasing and then decreasing. find the maximum element in the array.

2. Given an array of unsorted elements, find the minimum difference between any 2 elements in the array.

**1st f2f**

Discussion about my projects (nearly 20 mins)

1. 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. (extended to negative numbers)

2.Write a function to print the level order traversal of a binary tree in spiral form.

**2nd f2f**  
 Small discussion about my projects

1.Write a function to find the next smallest palindrome number of the given number. for example: if given number is 12345, then the next smallest palindrome is 12421.

2.Given 2 strings str1 and str2. What is the efficient way to navigate from str1 to str2? The constraints are i) a string can be changed to another string by changing only one character. ii) all the intermediate strings must be present in dictionary. If not possible, return “not possible to navigate from str1 to str2″. (pre-processing is allowed and enough memory is available). for example: str1 = feel and str2 = pelt, then the navigation is feel -> fell -> felt -> pelt (Hint: Graph)

**3rd f2f**

Discussion about my projects (nearly 20 mins)

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. It is not allowed to modify the lists. Also, not allowed to use explicit extra space.

2. Given a matrix of characters and a string, find whether the string can be obtained from the matrix. From each character in the matrix, we can move up/down/right/left. for example, if the matrix[3][4] is

o f a s  
  
l l q w  
  
z o w k

and the string is follow, then the function should return true.

**4th f2f Hiring Manager**

Deep discussion about my current project (nearly 45 mins)

(application architecture, challenges faced and a lot of technical discussion)

1. Write a program to check whether the given binary tree is BST.

**5th f2f Bar Raiser**

Deep discussion about my current project (challenges faced, etc) nearly 20 mins

Deep discussion on REST api authentications (Hash key vs Encryption & Decryption) nearly 20 mins

1. Given an input string, write a function that returns the compressed string for the input string in INPLACE. (no extra memory) (length of compressed string

For example, if the input string is “aaabcdeeee”, then the function should return “a3b1c1d1e4?.

GeeksforGeeks helped me a lot in improving my skills in DS and Algorithms.

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# Amazon Interview | Set 78

The first round was an online test hosted on Interviewstreet.com. Around 350 students appeared in the online test. The duration was 90 minutes. It consisted of 20 MCQs based primarily on Predicting The Output, OS, CN and Data Structures.

These questions were pretty basic and easily solvable.

Apart from that, there were 2 coding questions.

1. Given a string, find the first element which is non -repetitive i.e that element must not be present anywhere else in the string.

Eg : Input : teeterson   
 Output : r, as it is the first element which   
 is non repetitive.

2. Given a string of digits,find the next smallest number using the same digits.If its not possible to get such a number print -1;

Eg : Input : "123" Output : "132"  
 Input : "12453" Output : "123534"  
 Input : "987" Output : "-1"

After a week, the results came out and 25 students were shortlisted.

**Personal Interviews:**

**Technical Interview 1 :**

1. Given an array of 1s followed by 0s,find the number of 0s.

Eg : Input : 111100 Output =2  
 Input : 1 Output =0

I solved it by using Binary Search to find the first and last occurrence of 0 in the array and subtracting the results.

2. Given an array of positive and negative numbers, find the pair of elements whose sum is closest to 0.

Eg : Input : 3 5 -9 -4 17 11   
 Output 3 , -4

The brute force solution would be O(n^2) by comparing each pair of elements.As expected, he asked me to optimize my solution.  
 So I sorted the array using merge sort. (I know its not in-place but it did not strike me at the time)  
 Then used two indexes at the beginning and end of the the array and incremented/decremented the indexes as needed.

3. Given a Binary Tree , print all the root to leaf paths.

I started by telling him my approach and the logic behind the recursive solution that I had in mind. Then he asked me to write test cases for the function that I had written.

6 students were selected after this round.

**Technical Interview 2**

1. Given a binary tree convert it to a double linked list.

2. Given an array of integers , replace each element with the product of the remaining elements.

Eg : Input - 1 2 3 4   
 Output : 24 12 8 6

First, i gave the obvious solution. I computed the product of the whole array and then divided it by each element to get the resultant array.

But he asked me to do it without using the division operation. After some cross questioning I gave the following solution.  
 Store the product of the left side elements for each integer in an array L[].

For eg : Here , L[]= {1 , 1 , 2 , 6 }  
  
Do the same for the right side elements.  
  
Here R[] = { 24 , 12 , 4 , 1}   
  
The multiply R[i] and L[i] to get the resultant array.  
Complexity : O(n)

Finally 2 people were selected.  
 Result: Selected for a 6 month long internship as SDE-T (Testing)

GeeksForGeeks has been instrumental in my preparation for the interviews and I am really glad that I discovered this website at the right time.

PS : Could you guys tell me if the SDE-T position is inferior to the SDE-1 position or are they of the same level?

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# Amazon Interview | Set 79 (For SDE-1)

I have 8 months of experience and I recently appeared for interview of Amazon for role of SDE-I.

**Written Round:**  
 Q1: Convert a binary tree to DLL.  
 Q2: Given a random node address in Singly linked list. Delete that node.  
 You need to write full code in language of any choice with all the edge cases covered.

**Interview 1:**  
 Q1 : Given a sorted array and a number and element K. find K nearest elements to the number in sorted array.

Q2: MsExcel columns has a pattern like  
 A B C … Z  
 AA AB AC…. AZ BA BB … ZZ  
 AAA AAB  
 A has code 1  
 Z has code 26  
 AA has code 27  
 AAA has code 626  
 given a number return a column name as string

**Interview 2:**  
 Q1: Given 4 youtube servers which are processing user requests.  
 i> At any given time If someone requests for currently running videos, then return the number of videos running at a time.  
 ii> Which server will actually get the request ?  
 iii> How the servers will communicate with each other ?  
 iv> Other methods to do this task to reduce overhead on servers?  
 v> How many videos running given a time constraint ?

Q2: Given a binary tree and each node has an extra next pointer apart from left and right. Connect all the nodes using next pointer in Zig-Zag Manner.

**Interview 3:**  
 Q1: Discussion about project in current company.

Q2: Given a shared memory between multiple threads, how will you ensure safe access to memory in different scenarios like reading and writing? If at thr point of wrtitng there are mutiple read requests from threads how pending requests can be managed.

Q3: Given an array that has positive numbers and negative numbers and zero in it. You need to seperate the negative numbers and positive numbers in such a way that negative numbers lies to left of zero and positive numbers to the right and the original order of elements should be maintained

**Interview 4:**  
 Q1: Discussion about current project in company.  
 Q2: Why you want to leave your current company ?  
 Q3: Why Amazon ?  
 Q4: Which phone you have  
 Q5: Which one will you buy next  
 Q6: given a function with signature

bool isFactorialDivisible( int x, int y)  
 Return true if x! is divisible by y  
 else return false

After 3 days I got the confirmation call.

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# Amazon Interview | Set 80

**Online Written**  
 1. Cant remember the question exactly, but it was bit easy and was easily solvable using the substring function for the string.

2. Need to find whether two rectangles overlap or not

3. Need to find the matching percentage , if we are given two paragraphs

**Telephonic**  
 1. Need to find the least common ancestor for given two nodes

2. Implement Min stack problem with other optimizations

Fully functional code and covering all boundary conditions was required

**Face to face 1 (Hiring manager)**  
 1. Top K words from the file containing millions of words. Proper code for the scenario.

2. Why do you want to change the company

3. What is your manager review for you in your current company

4. What all projects you worked on and detail

5. Some other non tec questions

**Face to face 2**  
 1. Given a number n where n means 0,1,2,3….n-1. Compute the no of BST which can be formed using this range as input in any order

2. Given a string input : aaabbccdeeabb output should be : a3b2c2de2ab2  
 Challenge here is that we need to do it in place, without any other string or data structure

For both the problems full code with all the boundary conditions was required

**Face to face 3**  
 1. Rotate a 2D matrix by 90 degree, but here the matrix is stored in 1D form

2. Given a linked list which contains representation of any number, like for 1234, the representation will be 1->2->3->4. Now we need to add 1 to the number, so that the output is 1->2->3->5

3. Then he asked me 1-2 questions for which I immediately responded the solution, through that he got the idea that I already know the solution

4. Moved to the white board, he draw a matrix, each contains only 0 ad 1 but in sorted manner. I need to return the row which is having the max no of zeros. Then he asked me optimized solution for finding the first ‘1’ in the array

5. Then he explained me a production line problem, Many factors were involved in that, robotic arm need to draw some lines with various colors on some wall. We need to minimize the cost of drawing those lines, Code was not required in that situation, as the problem set was very big, but we discussed the complexity plus solving procedure for each of the factors of the problem. Every minute detail of how will I solve the problem.

Basically problem itself was composed of many different types of sub problems, keeping mind open at that time is very important.

Then after few days, I mailed the HR regarding the result, she told me one round is still pending, will update soon and after 1-2 week, they sent the mail for halting the process, didn’t get any solid reason, as it was totally unexpected, all my rounds went well.

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<http://www.geeksforgeeks.org/amazon-interview-set-80/>

# Amazon Interview | Set 81 (For SDE-I)

Hello Geeks, I had interview in amazon few days before. I’m sharing you my experience. It was for SDE-I Profile for Hyderabad(India) location.

**Round 1: Online Coding(Interviewstreet)**  
 Q1. Print the nth largest node of the given BST. In this question you will have to write a function.

Q2. Convert the BST into sorted doubly linked list. In this question also you will have to write a function.

Q3 & Q4 was simple algorithm based.

**Round 2: Telephonic Interview-I**  
 Q1. Given Matrix, and co-ordinates of sub-matrix of given matrix find sum.

Eg 1 2 3  
 4 5 6  
 7 8 9  
   
 Coordinates for submatrix 1,1 and 2,2  
 Sum= 28

Q2. Given a linked list reverse every n chunks.  
 EG: 1 -> 2 -> 3 -> 4 -> 5 -> 6…n = 3

Output: 3 -> 2 -> 1 -> 6 -> 5 -> 4…

later they extended this Question…If there is only one node and give many conditions.

**Round 3: Telephonic Round-II**  
 Q1. Design a data structure for insertion, deletion & get minimum element in O(1)time complexity? Implement the same.

Q2. Given a Binary Search Tree and two nodes find parent node which is parent of both nodes in a given binary search tree. Later the they extended it to simple binary tree.

**Round 4: F2F-I**  
 Q1. Is given n-ary tree is Sum tree or not? implement function…

Q2. find Nth largest element in an array

**Round 5: F2F-II**  
 Q1. Vertical traversal Order of tree(implement it).

Q2. Lots of discussion on project.

**Round 6: F2F-III**  
 Q1. Given a circular array and a pointer find the given element in the array.

Q2. Lots of discussion on current company & company’s work.

**Round 7: F2F-IV**  
 Explain:  
 1. Customer Producer problem,  
 2. Semaphore  
 3. Deadlock how to solve it.

Q: Favorite Sorting Algorithm.why,where to use it? and various question on the sorting algorithm which I answered.

Every time they ask for time complexity for code. Ask to optimize my solution.

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# Amazon Interview | Set 82 (For SDE-2)

**Round 1 (F2F):**  
 1) Find the merge point between two lists.  
 2) Given a sorted array find the number of BSTs you can form.

**Round 2 (F2F):**  
 1) Discussion projects i have worked on.  
 2) Given millions of files process them sequentially in multiple stages and make sure it has good scalabilty, error handling, elegantly handles changes to the system. etc.

**Round 3 (F2F):**  
 1) Given a matrix with each cell containing each number of candies, and a constraint that you can move only right or down, from the top left corner to the bottom right corner, find the path that gets you maximum candies.  
 2) Convert a Binary tree to its mirror in-place.

**Round 4 (Telephonic + online coding):**  
 Given a continuous stream of strings, maintain strings such that duplicate are eliminated on the fly. The interviewer wanted working code. So coded the solution during the interview and emailed it to him 10 mins after.  
 So if you get “Ted”, “John”, “Mark”, “Ted”, “David”, at the moment in  
 time, the list should contain John, Mark, David.

**Round 5 (Hiring manager in US, telephonic + online coding):**  
 1) Discussion on current projects.  
 2) Why Amazon  
 3) BFS vs DFS  
 4) Given a function to getFriends that gets a list of profiles of friends of a particular friend, implement a function to get the shortest path between two given profiles.

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# Amazon Interview | Set 83

**Written (50 Minutes)**

* 20 aptitude and general cs objective questions
* Code : Find minimum # elements to be removed from int array so that max element is <= 2x of min element
* Code : For given array a of size n we create a set of a[i] , a[a[i]] , a[a[a[i]]] ….. i varies from 0 to n-1 , find the max size of such set.

**Face to Face 1**

* Design MP3 player which would play only unique songs in random order from given list of songs
* Code : Print left and right most elements at all levels of a binary tree.
* Max elements in sliding window of size k over int array of size n.

**Face to Face 2**

* Code : Find min element at given level in binary tree
* How would you combine lots of big sorted files residing on disk ( file size >>> memory )
* What happens when you enter URL in browser.
* Design multiple stacks in a Single one big int array as efficient as possible ( real world example multiple process function stacks creation and deletion in memory of linux os )

**Face to Face 3**

* Discussion on challenging work projects.
* Design in-memory file system.

**Last round Telephonic**

* Toughest work project experience.
* A robot standing at top left corner of a grid, it can only move in right or bottom direction , determine total number of possible paths are their to reach bottom right corner.
* Code : Prune binary tree so that only nodes which are part of K-Heavy path remains, K-Heavy path means total of all elements in a path from root to leaf is > K.

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<http://www.geeksforgeeks.org/amazon-interview-set-83/>

# Amazon Interview | Set 84

I attended a hiring event for Amazon in world trade center in bangalore.

**First round was coding test (Written round) :**  
 1. Given a string of parenthesis, write a function if it is balanced.  
 2. Convert BST to a Doubly linked list.  
 3. Find the number of occurrences of words in a paragraph.

**First Round :**  
 1. Asked Why Amazon?  
 2. Asked some questions on resume.  
 After some friendly talk, jumped on technical but easy questions :  
 1. Implement BFS.  
 2. Difference between Dijkstra and BFS.  
 3. Given a linked list, find out if the list is circular, also find the point from where the cycle start.  
 4. Given an array, find the max sum over a sub array.  
 5. If you have two eggs, how many max steps you need to find the floor, from which the eggs break.  
 And some more easy questions.

It was already 5, so they decided to have further rounds later.

10 days later I had attended interviews :

**First Round :**  
 1. Asked about heaps, given an array, tell if it is min heap, if not, apply operation min-heapify.  
 2. Is a heap a complete binary tree?  
 3. Asked What is hashmap.  
      a. What happens when two numbers map to same key?  
      b. how does chaining work?  
      c. What to do when you have a bad hashing function, and only we can modify the structure of hashmap not hashing function?  
      d. What do to when you your hashmap is filled completely (as in all the linked list are filled up to their capacity)  
 4. What is quicksort? Implement for a linked list and tell complexity.

**Second Round :**  
 1. What is quicksort?  
      a. What is complexity when all elements are sorted and how can you improve it? (Randomization)  
      b. Will randomization work when elements are same?  
      c. What algorithms sort equal elements in O(n) time ?  
      d. using the information, how can you improve quick-sort? Think about it, its good. Don’t want to spoil it for you by writing answer here.  
      e. implement this modification.

2. Given two river banks (visualization : two parallel lines), one bank has numbers written (1….n) in sorted order. On the other bank the numbers (1…n) are arranged randomly. A bridge can be formed from the ith point from bank 1 to ith point in bank 2. Find the max number of non-intersecting bridges you can form?

3. Given 1…n , and given some statements like i hates j, then find some arrangement of n numbers such that if i hates j then in the arrangement i comes before j. Say 1 hates 2, then 123456789 is acceptable but 213456789 is not.

4. Asked about internet. What happens when you type a URL on your browser?

**Third Round (Hiring Manager):**  
 1. Why do you want to leave current company?  
 2. Why do you think amazon is the right place for you?  
 3. Implement a calculator which takes a maths expression and evaluates it and prints the result.  
 4. Given statements like A is connected to B. D is connected to E. And transitive connections are allowed. Write a code which takes input such connected statements and and two numbers i and j and returns true if i and j are connected (can be transitively), and false if not connected.

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<http://www.geeksforgeeks.org/amazon-interview-set-84/>

# Amazon Interview | Set 85

**1st Telephonic round**

After few project and introduction related question.

1. Write a program to find an element in sorted and rotated array.
2. Write a program to print all path whose sum is equal to a given number path must start from the root node and it may or may not end at the leaf.

**2nd Telephonic round**

After 3-4 days

Some c/c++ question what is malloc how does it work and memory layout and allocation related questions

1. Write a program to find longest repeating substring In a given string running code were required covering all base cases.
2. U have given 10 files and you have given a string suggest data structure which ll facilitate efficient search of string in the file if string appears more than ones in that case u have to print line number and file in which they appear.

After 15 days I got cal that I have cleared the telephonic round and my F-2-F interview is going to take place in Hyderabad

**F-2-F round 1**

After introduction and project related questions

1. Write a program to print a tree in vertical order asked more than one approach to do this problem and modified problem many times.
2. Write a program to convert a tree to doubly link list in post-order fashion only change of pointer are allowed that is left pointer can work as previous and right pointer s as next.

This interview went well J

**F-2-F round 2(Bar raiser)**

Few question related to OS what is deadlock, Race-condition, Semaphore and many more, few question Related to DBMS what is Normalization define all normal forms(I directly told him I don’t remember I read it in 5th semester )

1. Why amazon??
2. Why do u want to leave company XYZ.
3. Your biggest challenge till the date.
4. Many project related question.

Data structure

1. U have given 10 files each having 1 million integer in sorted order, physical memory have size of 3 million suggest method to extract 1 million integer in sorted form efficiently.
2. Write a program to convert a decimal number into binary your code should work on both big endian and small endian machine. U have given a variable which tell u whether machine is big endian or small endian

DBMS and few bar raiser question made this round average L

**F-2-F round 3**

1. You have given an n-ary tree write a program to check whether this tree is sum tree or not.
2. Given an array write a program to find kth smallest element in the array. He was hardly interested in the solution he just want to know how many ways u can solve it solved using 5-6 method at the end he was satisfied with the answers.

**F-2-F round 4**

Longest one….this interview went on for 1 hour and 30 minutes but was interesting one(interviewer looked lyk a frustrated guy…some tyms I felt that he is going to punch me  :P)

1. You have given M array each of size n all array are sorted separately write a program to make a big sorted array of size m\*n . during discussion he told me to prove many lemma like height of tree is log(n)( for n elements) sum of n natural number is (n\*n+1)/2 and many more. He modified problem many times don’t use extra space do it in space etc. discussion went on for almost 1 hour but at the end he was happy with the solutions(I suggested 2 method and further optimization in them.
2. U have given an binary matrix which is sorted row wise and column wise write a program to search a row in the matrix having maximum number of zeroes.

Finally this interview also went well he was happy with my performance

After 2-3 days I got mail from the HR that I m rejected LL reason was bar raiser … 1 advise to all don’t take BR round lightly it does not matter how well u performed in other round if u didn’t do well in BR round then there is no way u can make it. An average round tech interview is fine but average BR round means rejected.

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<http://www.geeksforgeeks.org/amazon-interview-set-85/>

# Amazon Interview | Set 87 (For SDE)

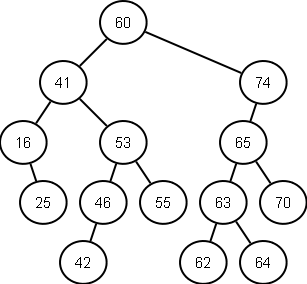
I recently cleared the Amazon SDE position. Through out my prepration GeeksforGeeks played great role, this is the only site which i referred/followed more than 90% of the time during preparation phase.

Please find my experience with amazon below.  
 **1 Written test**  
 1) Given a array of number find the next greater no in the right of each element

Example- Input 12 15 22 09 07 02 18 23 27  
 Output 15 22 27 18 18 18 23 27 -1

**2)** Given a link list and input int K, reverse the link list in K size slots

Example Input 12--> 13--> 3--> 20--> 55--> 87--> 20--> 77--> 90 Lets k =3  
Output 3--> 13->12--> 87--> 55--> 20--> 90--> 77--> 20

**3)** Given tree and input int K, Print the nodes that are k distance way from leaf.  
 Input is below tree and k = 3  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/image.png)

Output- 41, 53, 65, 74

**2. First F2F round (DS and Algo)**  
 Two interviewer was there in panel, Only one was asking question other was only observing, He was noting down all the conversation happening between us and noticing approach and solution provided by me. This was common in all the interview rounds.

**1)** Given a infinite string of O’s and 1’s respectively. You need to find the transition point from 0 to 1.  
 I gave the native solution in O(n). He told to optimize more. Direct binary search can’t be applied on it because string was infinite and length of string was not given.  
 I told that i will divide the string in 10 size slots it will reduce complexity. Still he told to optimize more. I told i will increase the slot size in power of 2 like 2,4,8,16,32. he was satisfied with that.  
 He again complicate it by adding that now my string contain 0, 1, 2 in sorted order. You need to find transition point from 0 to 1 and 1 to 2. i provided the approach.  
 After that told this time i want to make it generic. String can contain 0 to n(input) number find all the transition point. I solved it, he was satisfy with approach and told me write code for it.

**2)** Find common elements out of two sorted array

**3. Second F2F(DS and Algo)**

**1)** It was bit difficult for me to crack, She stated asking from java cloning, which was my weak area. Given a class which contain string Name and reference to person friend, clearly shown below.

Class A {  
 A(String str, Person P { //Constructor  
 this. name = str;  
 this.friend= P ;  
 }  
 // override  
 Clone() {  
 // code for this function was expected from me  
 // which can produce the deep copy  
 }  
}

Suppose A–>B–>C–>D means A is friend of B, who is friend of C and so on..  
 Calling once the Clone method will clone the whole friend list like  
 A’–>B’–>C’–>D’ (there A’ is the clone of A).  
 Cracking this was really tough for me, because i was not familiar with these question.

**2)** How to find the last nth element from singly link list, its was very easy for me.  
 Solved in 2 min and wrote the code quickly.

**3)** Given a sorted array of number , value K and value X, find the K nearest number to the value  
 Example: Input 12 16 22 30 35 39 42 45 48 50 53 55 56 K = 4 X = 35  
 Output 22 30 39 42  
 Interviewer was running out of time because 1st question took huge time. So she told to tell only the approach, code was not expected.

**4. Third F2F (Bar raiser)**

Interviewer was of friendly nature. He was very senior and very cool guy. Started with my project question and then some behavioral question and in last one technical question

1. What is your current project, What value you added in your project till now.
2. What challenges you faced while working in project and how did you overcome.
3. What was the important learning for you in last project.
4. If you have the option to go 3 year back in life, then what would you like to change in life, means which skills and steps/decision you want to gain or change.
5. What you did in past on which you feel proud.. blaa blaa….
6. Given a tree, how will you find the vertical sum of nodes

* refer this link to understand more about question
* I gave the solution using Hash map, but he was not satisfy with answer. He told to gave other solution because Hash map will increase the space complexity. I used array solution which was increase time complexity, then i used circular link list and finally solve it using doubly link list. He was satisfy with solution. Told me to code for it.

**5. Forth f2f round(OOPS, design pattern and OS fundamental)**

1. Started with my project details, my project was in android mobile, so he told me to design a “Contact application”. Class diagram and their relationship was expected from me. What all design pattern you can use in that.
2. Explain inheritance and Base class is given you need to stop exposing the base class methods without touching the base class at all. It was really tricky.    question i liked it.
3. What is deadlock and How to detect deadlock in system.
4. Concept of Database normalization and various types of it.
5. He also started asking some networking question. Like TCP/IP, socket connection.
6. How the chat between 2 user work internally, internally how the packets flows between layer. And suppose user A send “Hi” message to user B and user B just shutdown the system. What will happen in that case.

**6. Fifth f2f (Hiring manager)**

1. Why you want to join Amazon.
2. What did you know about Amazon.
3. Current project explanation.
4. What new code you implemented and how much impact it put on other.
5. Given a tree, write the In-order traversal. I wrote in 2 min using recursion.

* Next addition was, can you write it using iteration tried and wrote some buggy code.
* He started checking and told the bug and told me to correct it. Even-through i solved the same question at my home, Still it was not clicking my mind. I started correcting it but failed. After that interviewer gave one hint. I used the hint and solved the whole code again. He was running out of time so took the code sheet and told i will check it later in free time.
* Refer this link for actual solution and proper understanding of last question

**Message for all :-**  
 Amazon expect accurate and precise code with less complexity. So discuss first with your interviewer the approach. Don’t jump into code.  
 Even if you don’t know the right answer, keep on discussing various possibilities to solve the question and try crack that problem with different angle. Practice more and more verity of questions.

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<http://www.geeksforgeeks.org/amazon-interview-set-86-sde/>

# Amazon Interview | Set 86

This is an account of my recent interview experience with Amazon. My process started off at one their hiring drives. It was a tiresome process that comprised a written round followed by six rounds of interview, spanning around 37 days.

Following is an account of my experience:

**Round 1 (Written round):**  
 1. Given two linked lists each of which represent a number, write a function that returns a linked list that represents the sum.

2. Given a sorted array of numbers. Construct a balanced binary tree with the numbers in the Array as keys.

3. Given a sorted Array of numbers that has been rotated by a few positions, write a function to search an element in the Array.

**Round 2 (F2F):**  
 1. Given a binary tree in which the node structure has an additional field called “next” which of pointer to tree node type, fill up this field of each node to point to the next node at the same level (NULL if last node).

2. Sort an almost sorted Array. An almost sorted Array being an Array in which a number is at the most k positions away from its position in the sorted Array.

3. You are given a 2D grid in which each cell is either empty, contains an entry “D” which stands for Door, or an entry “W” which stands for wall (Obstacle). You can move in any of the four directions from each empty position in the grid. Of course you cannot move into a cell that has “W” in it. You need to fill each empty cell with a number that represents the distance of the closest door to that cell. (They asked me only for the Algo as there wasn’t much time).

**Round 3 (F2F):**  
 1. Given a 2D (Rectangular) grid of points. You need to find the shortest path from a given source point to a destination point. You can only move up or right. Now among these points, there a few special points from which you can directly jump to the diagonally opposite point (Top-Right diagonal). You are granted a function which when invoked on the point returns 1 if it is a special point and 0 if it is not.

2. You are given a sequence of black and white horses, and a set of k stables numbered 1 to k. You have to accommodate the horses into the stables in such a way that the following conditions are satisfied:

a. You fill the horses into the stables preserving the order of horses. For instance, you cannot put for horse 1 into stable 2 and horse 2 into stable 1. You have to preserve the ordering of horses.

b. No stable should be empty and No horse should be left unaccommodated.

c. Take the product (number of white horses \* number of black horses) for each stable and take the sum of all these products. This value should be the minimum among all possible accommodation arrangements.

**Round 4 (F2F with Hiring Manager):**  
 1. Discussion on my current work, difficulties and challenges faced at work, difficult people I have had to work with, instances when I went out of my way to propose creative solutions to existing problems at work etc.

2. Given a parentheses string, determine if it is a valid / legitimate parentheses string. For strings consisting of single parentheses type and those consisting of multiple types.

**Round 5 (F2F – Bar Raiser):**  
 1. Discussion on my current work, difficulties and challenges faced at work etc:-

2. Given a floor of dimensions 2 x W and tiles of dimensions 2 x 1, write code to find the number of ways the floor can be tiled.

3. Given a graph, if we were to print all nodes within k hops of a given node, which algorithm would we use, the answer to this was obviously a Breadth first search. He followed it up asking, if one were to use Depth first search instead to code this problem instead, one would encounter bloated running times for Graphs with certain attributes (Perhaps Dense graphs or some such). Describe what types of graphs would a DFS algorithm falter with and why.

**Round 6 (Telephonic Interview):**  
 1. Given that you want to maintain a backend for a bookstore Application that would store names of Authors and books, such that the application can return all the books written by a specific Author and all the Authors of a specific book which is specified in a query. The query can be such that only a substring of the Authorname or the bookname is specified and all the matches should be returned. I proposed a trie based solution, and was asked to code the solution on a collabedit shared document.

2. Describe multithreading.

3. Describe all the processes that happen between you typing in a URL and the webpage appearing on your screen.

4. What is a singleton set What is the data storage model (Data structures) used to store records in a relational Database.

5. Given an Array containing numbers between 1 to n, out of which 1 number is missing, find the missing number.

6. Given a sorted Array and a number, print all pairs of numbers in the sorted Array that sum to the given number.

I got the confirmation call the same evening that I had the telephonic interview. ***GeeksForGeeks is a godsend for interview aspirants aiming at top companies. Keep up the outstanding work guys, your website has shaped careers and lives. J***

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# Amazon Interview | Set 88

**Online Test:**

1. Rectangle overlap problem
2. String searching problem
3. Coin change problem

**1st Telephonic interview:**

Questions regarding processes in OS(how it is represented in memory like code segment, data segment, stack , heap), garbage collection , stack and heap , what happens when a URL is entered in browser and then proceeded to 2 programming questions

1. Given a BST, transform it into sum tree where each node contains sum of all nodes greater than that node.
2. Shuffle an array

(All arrangements were done by Amazon including travel, stay)

**Onsite F2F 1:**

Started with general introduction , asked about my work , know any design patterns and where you applied them in your project etc.

He asked a single question to design a single stack with push , pop and pop mid operations , followed by working code.

**F2F2:**

Again started with general introduction , work i do , then he gave a question about finding count of each occurrence of words in a document.

I gave hashing based solution (with working code), it lead to a great discussion on hashing , then he led me to give a solution with tries . As much time is not left he asked me to tell the approach only.

**F2F3 (With Bar raiser):**

Bar raiser will be from a different team.

He asked me a question to connect siblings at each levels of a binary tree , as i knew this question already. He wanted working code. After i gave the code he found a bug and i found one myself.After resolving the code he moved on to different question.

Next question is optimal implementation of 3 or more stacks in a single array.I gave some approached based on heuristics and with extra memory.He dint seem satisfied and then asked many questions about work i do and grilled me on many aspects.

**F2F4(With Hiring Manager):**

Asked me to design Automated Air traffic controller system . Gave me few requirements , made me identify classes and its members , and some high level code for identifying probable aircraft collisions.

He asked me about situations where i missed the deadlines and learnings from it , How do you build trust with Customer .

Then i asked him few questions like What specific qualities you look for in a potential candidate , How an SDE can contribute to Amazons claim to be most customer centric company and any concerns about my employment background (as i am working in manufacturing industry currently).

Interviews were held on friday , i got a call from HR lady on Tuesday following week.

**Some tips:**

1. Practice lot of pen and paper code.
2. Folks at amazon do not want pseudo code , they want working code with minimal syntactical errors.
3. Online plus telephonic rounds are for screening only.Also , Don’t pass the time in telephonic rounds, they want to give at least two questions (easy though)
4. McDowell’s book and recent 40 sets of amazon interview experiences will make you good to go.

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# Amazon Interview | Set 89

**Online round:**  
 1) Program to check if two rectangles overlap.  
 2) Program to find if a given string, say S, contains another given string, say P.  
 3) Write a program to check if the coins can be summed up to a given number, if yes print the coins that sums upto the given sum.

**Telephonic round:**  
 1) Given a singly linked list, modify the value of first half nodes such that 1st node’s new value is equal to the last node’s value minus first node’s current value, 2nd node’s new value is equal to the second last node’s value minus 2nd node’s current value, likewise for first half nodes.

Ex:   
 1) 1 -> 2 -> 3 -> 4 -> 5 -> 6 -> 7  
 Modified list:   
 6(7-1) -> 4(6-2) -> 2(5-3) ->0(4-4) -> 5 -> 6 -> 7  
 2) 1 -> 2 -> 3 -> 4 -> 5 -> 6 -> 7 -> 8   
 Modified List:   
 7 -> 5 -> 3 -> 1 -> 5 -> 6 -> 7 -> 8

2) Reverse the alternate level nodes of the binary tree.

Ex: Given tree:   
 a  
 / \  
 b c  
 / \ / \  
 d e f g  
 / \ / \ / \ / \  
 h i j k l m n o   
  
Modified tree:  
 a  
 / \  
 c b  
 / \ / \  
 d e f g  
 / \ / \ / \ / \  
 o n m l k j i h

**Face to Face Rounds:**  
 **Round 1:**  
 • Thorough discussion about one project that I considered as the most interesting or challenging.  
 • Suppose we need a service to perform certain task every day at some specified time. How do we ensure that everyday at the specified time the service will do that task?  
 • Design a stack that supports push, pop, and retrieving the minimum element in constant time.  
 • Program to get the maximum distance between two nodes in the binary tree. The interviewer further generalized this problem for n-ary tree. Then he asked how to get the longest path in a graph.

**Round 2:**  
 • What happens when we enter the url in the browser?  
 • Difference between inner join and outer join.  
 • How does the garbage collector works in java?  
 • Questions on stacks and heaps(memory management).  
 • We have n gold coins. We need to amalgamate all the n coins to create one single coin, we can merge two coins at once. The cost of merging two coins is equal to the value of those coins. How do we ensure that the cost of merging n coins in minimum.  
 Ex: 5 ,8 , 4, 3, 9, 6  
 We will merge 3 and 4, cost=7 {Remaining coins: 5,8,9, 6,7}  
 Then we merge 5 and 6, cost=11 { Remaining coins: 11,8,9,7}  
 Then we merge 7 and 8, cost=15 { Remaining coins: 11,15,9}  
 Then we merge 9 and 11, cost=20 { Remaining coins: 20,15}  
 Then we merge 20 and 15, cost=35 { Remaining coins: 35}  
 Total cost: 7+11+15+20+35 = 88

If we had merged the coin array {5, 8, 4, 3, 9, 6} in different fashion:  
 Merging 5 and 8, cost=13 {Remaining coins: 13, 4, 3, 9, 6}  
 Merging 13 and 4, cost=17 {Remaining coins: 17, 3, 9, 6}  
 Merging 17 and 3, cost=20 {Remaining coins: 20, 9, 6}  
 Merging 20 and 9, cost=29 {Remaining coins: 29, 6}  
 Merging 29 and 6, cost=35 {Remaining coins: 35}  
 Total cost: 114

As we can see that the cost is less in the first case. Program to get the minimum cost of merging all the n coins.

• Replace BST nodes with the sum of nodes greater than or equal to the node.

**Round 3 (Hiring Manager):**  
 • Detailed discussion of my work in the current company.  
 • Some behavioural questions like how do you handle certain situations etc.  
 • Design a restaurant reservation system. I was also asked to write some sql queries in this regard.

**Round 4 (Bar Raiser):**  
 • Given a linked list, write a function to reverse every k nodes (where k is an input to the function).  
 • Given a sorted array which may contain duplicates, write a method to find the starting and the ending index of the given number if present.  
 Suppose we are give array: 1,2,2,2,5,6,6,9,10,10,10  
 If the number given is 9 then starting index and the ending index will be 7.  
 If the number given is 2 then the starting index will be 1 and the ending index will be 3.  
 If the number given is 7 the the starting and the ending index will be -1 as the number is not present in the array.  
 • Write a method to compress a given string “aabbbccc” to “a2b3c3″ . It should be an inplace compression, no extra space to be used.  
 • Discussion about my current project.  
 • Describe a scenario when you failed, when you helped our collegue etc etc.

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<http://www.geeksforgeeks.org/amazon-interview-set-89/>

# Amazon Interview | Set 90

**1. Phone Interview**  
 a. Given sorted array in decreasing order. Find first occurrence of given key.  
 b. Find diameter of a binary tree.

**2. Face to face 1 (Programing skill)**  
 a. http://www.geeksforgeeks.org/dynamic-programming-set-31-optimal-strategy-for-a-game/  
 b. Merge N sorted lists to a single sorted list but comparisons should be minimum

**3. Face to face 2 (DS round)**  
 a. 1 represent A, 2 rep B etc and 26 rep Z. Given a number, find number of possible decoding for this number. No need to consider number starts with zero. Eg: input – 1234, output – 3(ABCD, AWD, LCD)  
 b. How to find a loop in linked list. How to remove this loop.  
 c. How to design LRU cache(looking for the DS’s used and their interaction)

**4. Face to face 3(Design)**  
 a. A device need to upgrade and downgrade its software. Eg: mobile phone need to upgrade its OS. Design high level and low level.  
 (follow-up – 1. form version X to Y is not possible but z can. 2. from current version to latest version not possible but we can upgrade to an intermediate version and then to latest version. What  
 DS will be effective here)  
 b. Design a semaphore.

**5. Face to face 4(curtain raiser)**  
 a. HR questions including prev projects, best work etc  
 b. Given a linked list where each node contains an extra arbitrary pointer which points to any node in the list. Write code to clone the list.  
 b. Print vertical sum of a binary tree.  
 c. Print a binary tree in vertical zig-zag order.

**6. Manager round**  
 a. manager round HR questions. Team fit questions etc.  
 b. Given a mathematical expression. How to design this expression evaluator using OOPs concept.

Each round consists of 1 to 1.30 Hrs.

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<http://www.geeksforgeeks.org/amazon-interview-set-90/>

# Amazon Interview | Set 91

I recently got interviewed with Amazon for SDE position for their Hyderabad office.

**Round 1: (F2F)**

1. Discussion around current company and work I was doing there. Why Amazon?
2. There is a robot standing at first cell of an M\*N matrix. It can move only in two directions, right and down. In how many ways, it can reach to the last cell i.e. (M, N). Discuss all the approaches and then asked to code it.
3. Remove the nodes in the binary tree for that the sum of all values from root to leaf is less than K.

**Round 2: (F2F)**

1. Convert a Binary Search Tree to DLL in-place.
2. Implement LRU policy.
3. Find the First Non Repeating Character in a stream of characters. Use Constant Space and linear complexity in terms of character count.

**Round 3: (F2F)**

1. Why do you want to leave your current organization?
2. Current Project Discussion and your contribution in the project.
3. Some Nice Behavioral questions.
4. Given a magazine of thousands of pages. You have to construct a note out of it by cutting the words out of it. You can only cut whole word from magazine and you can’t add any words. Also, you can’t cut partial words or alphabets from it.

**Round 4: (F2F)**

1. Given an array of size N= k\*s. In this array, construct blocks of k size each (Number of such blocks will be s). Now find all combinations of these numbers such that difference among the k numbers in the block should not be greater than d. e.g. N=6, k=2, s=3 A={2,4,6,8} and d=2. So the answer should be 2 {{2,4},{6,8}},{{4,6},{6,8}}.
2. Given a binary tree with usual left and right pointers and one additional pointer called adj. modify the tree in-place such that adj pointer should point to the right node in same level as current node or if it there is no node right to it, adjshould be NULL.

**Round 5: (F2F)**

1. How many Binary Search trees can be constructed using sequence of N numbers? Write Code for it.
2. How many cycles of length 3 can be constructed using edges of aundirected graph?

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# Amazon Interview | Set 93

I have just completed a full interview with Amazon and wanted to give back to GeeksForGeeks my experience because it has helped me so so much to go through it.

**1st phone interview**  
 Why Amazon?  
 How do you find out the cause of a slow UI request?  
 Write function to convert a stream of incoming characters to an integer.  
 Write function to convert one character to one digit number.

**2nd phone interview**  
 Get nth to last element  
 Check if 2 binary trees are equal recursively and iteratively

**On-site interview**  
 1st interview  
 Write a url shortner. Design scalable architecture that host this service.

**2nd interview**  
 Array vs linked list. Rest vs Soap. What is a hashtable? Write code to handle hashtable collisions?

**3rd interview (lunch)**  
 Situation where you missed a deadline.  
 What are you proud of the most in your career?  
 Situation on how you handled conflict.  
 Other behaviour questions

**4th interview**  
 Why Amazon?  
 Build a clone of a binary tree sent from a different machine

**5th interview**  
 Design and implement algorithm to find the shortest path from start to finish of a maze.

I thank GeeksForGeeks for all the help it gave me.

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# Amazon Interview | Set 95 (For SDE-I)

Hi, Below is my interview experience for Amazon for SDE-I position.

**Round-1(F2F)**  
 1.) Traverse a binary tree in a spiral manner. (zig-zag manner)  
 2.) Given a number, find the just greater number than the given number containing the same digits as the given number. Write code for this.

**Round-2(F2F)**  
 1.) Print a binary tree in a level order traversal but in bottom to top manner.  
 2.) Given 2 BSTs, validate their equality. Both are equal if they consist of the same set of values  
 irrespective of their structures. (Can you traverse them parallely).  
 3.) Given a infinite stream of integers, find the first non-repeated number till now. Write code for this.

**Round-2(F2F)**  
 1.) Given a binary tree, convert it into doubly linked list and after the conversion, the linked list should  
 look like the post order traversal of the binary tree. The conversion should be in-place. What is the time and space complexity of the program.  
 2.) Given the following sequence  
 A, B, C,…..Z, AA, AB, AC,…….AZ, BA,…..BZ…..ZZ, AAA…..  
 1, 2, 3,…..26,27………………………………………..  
 Given n, return the string. What is the time and space complexity of the program.  
 Write code for this.

**Round-4(F2F) – with Hiring Manager**  
 1.) Given an array, return the second largest number. Write code for this.  
 You can not modify the array, just traverse the array once and return the required number.  
 Handle all the edge cases. What should be the function signature.  
 2.) Given two files which contain very large size of number, say the size of the file is 5 GB.  
 That means that you can not load the whole file into memory. How would you add these two files and store the result in another file. Long discussion on optimization.

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# Amazon Interview | Set 96 (On-Campus for Internship)

I’m a 3rd year grad and amazon visited our campus. My interview had only 3 rounds.

**Round 1 (Online round 20 MCQ’s and 2 coding questions )**  
 MCQ’s were mostly on data structures ,time complexities and C,C++ outputs with 2 aptitude questions.  
 1) Given 2 linked lists of digits as data in their nodes add two numbers.

Eg: 1 -> 2 -> 3 -> 4 and 4->3   
 print 1 - > 2 -> 7 -> 7

2) given few sets of intervals print out the the entire intervals without overlapping , if they overlap then combine them into one.

Eg: Input : (5,7) (1 , 6) (2 ,4) (10 ,14) (8,9)   
 Output : (1,7) (8,9) (10,14)

**Round 2 (F2F)**  
 Tell me something about yourself.  
 1) Convert a BST into inorder, preorder and postorder linkedlists inplace.

2) Make a queue out of 2 stacks, as it was easy he asked me to code and asked me the complexities.

3) Given a linked list with a loop find the loop and make it straight . I did with HashMap but he told me not to use extra space so i told him floyd’s cycle.

He asked me i had any questions.

**Round 3(F2F) (After lunch)**  
 1) Given a Binary tree convert into a BST no auxillary space (i did it with an inorder traversal) he asked me to code.

2) Given an infinite stream of characters find the first non repeating character at any instance , The storing,retrieval should be o(1) .  
 I told him a solution using a hashmap then he modified that he may have millions of unique characters not just alphabets.  
 i gave a solution with a linked list and a hashmap. This question was not asked to me but was to my friend .Its a good one.

3) print all the binary values of number from 1 to n , each number’s binary should be printed in 0(1).  
 for eg: n = 6  
 then print 1 10 11 100 101 110. printing 1, 10 ,11 ,100,101,110 should be in o(1) each

I thank Geeksforgeeks for letting me know about Floyd’s cycle .

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# Amazon Interview | Set 97 (On-Campus for SDE1)

I had my amazon interview few days back in my campus.

**First Round:**  
 First round was a simple round. It had 20 MCQ questions on C/C++ and 2 coding questions. The coding questions were:  
 1.) You have given an array in which numbers are first increasing and then decreasing. Find the maximum element in O(log n).  
 2.) Swap the data of alternate nodes of a list.

We were given 90 minutes for 22 questions. For objective questions, you should be clear with virtual functions, inheritance, data types etc.

**Second Round:**  
 In this round, we were divided in groups. And a tree problem was given. We have to solve them individually.  
 My problem was:  
 Given a bst and two boundary values. Prune the tree if the node data lies outside the boundary values

**Round three:**  
 In this round,  
 1) Reverse a doubly linked list and a singly linked list. Both iterative and recursive. Which one is better approach and why?  
 2) Can you reverse a list in less than O(n)?  
 3) Differences between list and array. Which data structure you like and why?  
 4) How will you find the kth node from last in a list? Discussion on optimization  
 5) Given a string. Print all permutations of it. Discussion on time complexity and optimization.

**Round four:**  
 1) Interleaving of a string. A big discussion on various test cases. Your code should handle the case if the string contains repeated characters.  
 2) Check if a binary tree is a bst or not  
 3) find diameter of a tree.Follow up how will find the height of a binary tree?

**Round five: Problem Solving round**  
 1) Given an array of heights of poles. Find the no of poles which are visible if you are standing at the ith pole.  
 2) You have a you tube video. A person watches the video in random order. You have given the start and end time of various intervals he watched. How will you confirm whether he has watched the full video or not.  
 3) Given a number. How will you find the next greater number with same digits.

**Round Six: (HR round)**  
 1) tell me about yourself.  
 2) why amazon?  
 3) Project discussions.  
 4) A little discussion on OOPS.

All the best Guys.. 

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# Amazon Interview | Set 98 (On-Campus)

I am a fourth year undergraduate CSE. I had my amazon interview in my campus.

**First Round:**  
 First round was a simple round. It had 20 MCQ questions on C/C++ and 2 coding questions. The coding questions were:  
 1.) You are given a string that represent an expression of digits and operands. Eg. 1+2\*3 , 1-2+4. You need to evaluate the string or the expression. NO BODMAS is followed. If the expression is of incorrect syntax return -1.  
 Test cases :  
 a) 1+2\*3 will be evaluated to 9.  
 b) 4-2+6\*3 will be evaluated to 24.  
 c) 1++2 will be evaluated to -1(INVALID).  
 Also, in the string spaces can occur. For that case we need to ignore the spaces. Like :- 1\*2 -1 is equals to 1.

2.) You are given an array of both negative and positive integers. You need to rearrange the array such that positive and negative numbers alternate. Also, the order should be same as previous array and only O(1) auxiliary space can be used and time complexity boundation O(n).  
 eg. -2 3 4 5 -1 -6 7 9 1  
 result – 3 -2 4 -1 5 -6 7 9 1.

**Second Round:**  
 In this round, we were divided in groups of 5. And two problems were given and we need to write the code on paper for that problem.  
 My code were :  
 1.) You need to determine whether the linked list is palindrome or not.

2.) Print the level order traversal of the binary tree in the spiral form.[They also asked us the solution without any extra space and O(n)  
 Time complexity].

**Third Round(F2F):**  
 Interview asked me to write the code for the two problems which are :  
 1.) Reverse the alternate K Nodes of the Linked List.  
 eg. 1->2->3->4->5->6->7->8->NULL  
 Result – 3->2->1->6->5->4->8->7->NULL.

2.) You are given the binary Tree and the two nodes say k1 and k2 . You need to determine whether the two nodes are cousins of eachother or not.  
 eg. 6  
 / \  
 3 5  
 / \ / \  
 7 8 1 3  
 and say two node be 7 & 1. result will be TRUE.  
 say two nodes are 3 & 5. result will be FALSE.  
 say two nodes are 7 & 5. result will be FALSE.

3.) Give the algorithm, data structures, time complexity and space complexity for the following problem :  
 In our mobile phones when we enter say four initials of the number say 9 4 5 6, then our phone shows the whole lists of number that starts with these entered number.  
 Now the problem is : how it is implemented and what is the best way of doing this keeping the balance between space and time complexity. Also, user can enter any number of initials and your program should print all the numbers with those initials that are present in your phonebook.

**Fourth Round(F2F):**  
 Interviewer asked some questions on C++ . They were :  
 1. What are [virtual functions](http://www.geeksforgeeks.org/virtual-functions-and-runtime-polymorphism-in-c-set-1-introduction/)?  
 2. What is the[use of virtual functions](http://www.geeksforgeeks.org/virtual-functions-and-runtime-polymorphism-in-c-set-1-introduction/)?  
 3. What are pure Virtual functions?  
 4. Syntaxes of Virtual functions and [pure virtual functions](http://geeksquiz.com/pure-virtual-functions-and-abstract-classes/)?  
 5. What are [abstract classes in C++](http://geeksquiz.com/pure-virtual-functions-and-abstract-classes/)?  
 6. How we can implement pure virtual functions in JAVA ?

Design question :  
 How we can restrict our class so that only single instance of it can be created?  
 What is Singleton Design Pattern?

Operating system Question :  
 1. What are semaphores?  
 2. What is producer consumer problem and give different solution for it?

Two questions he asked me to code :  
 1.Convert one string to another string.For that purpose you can use three operations – SUBSTITUTE,DELETE,INSERT.Each having cost as one except  
 substitute having cost 2.You have to determine the minimum cost required.  
 For eg.  
 First String : INCLINE  
 Second String :DECLINE  
 Minimum cost required are : 4 [change I to D and N to E].

2. Implement the stack in which push(),pop() and getMiddle() has O(1) complexity at any point of time.

3. Find the maximum size BST present in the binary tree.

He also asked question about my projects and why I choose them. He asked to just explain the whole set of thing that I have performed in it.  
 (About 10 minutes discussion)

**Fifth Round(F2F):**  
 This round started with the deep discussion about my projects. Interviewer tried to get each and every aspect of my project with lot many why  
 and how questions.She asked me the future scope of my project and what are learnings I got from it.(About 30 minutes discussion).

Then she asked me implementation, algorithm, data structures, time complexity and space complexity for the following problem:  
 Say we have website having several web-pages. And also there are lot many user who are accessing the web-site.  
 say user 1 has access pattern : x->y->z->a->b->c->d->e->f  
 user 2 has access pattern : z->a->b->c->d  
 user 3 has access pattern : y->z->a->b->c->d  
 user 4 has access pattern : a->b->c->d  
 and list goes on for lot many users which are finite and numbered.  
 Now the question is we have to determine the top 3 most occurring k-Page-sequence.  
 for the above example result will be : (k=3) a->b->c , b->c->d , z->a->b.  
 [Question took the long discussion and she kept adding constraints, cases and more problems to the above problem.]

One question she asked me to code which is:  
 You are given a sting. Find the character in that string which is not repeated and which occur last in the sequence.  
 Eg.- aababaacdffgxc  
 Result – x

I would like to thanks GeeksForGeeks which helped me to improve my knowledge and understanding of Data structures and Algorithms 

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<http://www.geeksforgeeks.org/amazon-interview-set-98-campus/>

# Amazon Interview | Set 99 (On-Campus)

Amazon interview experience :-

**1st Round :-**  
 20 mcq and 2 coding questions  
 1. Left view of binary tree  
 2. addition of 3 link list

**2nd round F2F :-**  
 1. check listlist is palindrome or not  
 2. level order traversal in spiral form

**3rd round :-**  
 1. Length of the longest substring without repeating characters  
 2. Length of the longest substring who occur more than one in string  
 like :- geeksforgeek so answer is geek.

**4th round :-**  
 tell me abt ur self  
 check tree is BST or not and code for it  
 Check number is power of 2 or not  
 what is Dns  
 difference btw TCP and UDP  
 one tough question is which i dont remember but it i dont know how to solve this question but interviewer help me alot to crack this question and ask me to code for my algorithm.

**5th round(HR round) :-**  
 1. about myself  
 2. 15 min. about my project  
 3. given a string return character whose count is 1 and position is right most… example :- aabccddefff so b and e count 1 :- so return e.  
 4. given a newspaper you have to find word in it.. so i solve it by trie.

**suggestions :-**  
 1. if you dont know answer of coding question so dont worry interviewer will help you. He always give you hint and you have to think on that way.  
 2. GeeksforGeek  
 3. Always say interviewer what is your intrest subject.

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# Amazon Interview | Set 100 (On-Campus)

First of all many many thanks to geeksforgeeks for such a great guidance. Amazon visited our campus for recruitment. Here is my interview experience.

**Round -1**  
 20 MCQs (C ,Aptitude,DS,DBMS,Networks)  
 2 programming questions were asked-  
 1.) Print all root to leaf path of a given binary tree whose path sum is a given value k.  
 Note: tree was given in the form of array (so no need to create the tree).  
 Input: Input contains two space separated integers K and L followed by 2^L-1 space separated values  
 Output: All root to leaf path which has a path sum = k.  
 Sample Test case :  
 Input :  
 40 4 10 11 13 # 15 28 6 # # 8 4 # 9 11 #  
 Output:  
 10 11 15 4  
 10 13 6 11

2.) Given few sets of intervals print out the the entire intervals without overlapping, if they overlap then combine them into one.  
 Sample test case:

Input : (5,7) (1 , 6) (2 ,4) (10 ,14) (8,9)   
Output : (1,7) (8,9) (10,14)

**Group fly Round:**  
 2 ques were asked in this round. We were asked to write code on paper very fast.(It was an elimination round.

1.) Given a binary tree as below

A  
 / \  
 B C  
 / \  
 D E  
 / / \  
 F G H

Convert the structure of the tree like a left aligned tree whose each node contains a down pointer and a right pointer and looks like the below tree..

A  
 |  
 B – C  
 |  
 D—E  
 |  
 F—G – H

2.)The arrival and departure time of trains are given. Find the minimum number of platforms to accommodate all the trains.

Eg. Arrival Departure  
 7 11  
 8 10  
 13 14  
 4 6  
Output: 2

**Round 2. (F2F)**  
 1. An array is given in which elements are first monotonically increasing and then decreasing.  
 Search an element in the array. Working code was asked which takes care of all the edge cases. Also asked the time complexity of the code.

2. Implement queue using 2 stacks .  
 What would be the complexity of enqueue and dequeue operation. I told him O(1) for enqueue and O(n) for dequeue. Then he asked to optimize it. Then he asked the Average case time complexity.

**Round 3 (F2F)**  
 1. You are given a graph. Write a function to remove all the cycles. Means after the function call the graph must be converted into a connected acyclic graph(tree).  
 2. What happens when u send an email to someone.  
 3. What is socket ? What is port?  
 4. Which protocol is secure for mail transfer? Which protocol is used by Gmail?  
 5. What is the port number of SMTP?  
 6. Suppose u open notepad and type something and save it what would happen.  
 7. What is static member?  
 8. What is singleton class??  
 9. If a class has all its members as static would it be a singleton class? Compare them.  
 10. What is process scheduling? How does it happen? What are various queues maintained by the system? (Where does the scheduler process run ??- This ques was asked in 2nd round of DE Shaw & co).  
 11. Suppose various process are waiting for a particular resource? What is this situation called? How does the system overcome from this problem?  
 12. What the various ways of process communication?  
 13. What is thrashing ?How to overcome from it?

**Round: 4.)(HR + Technical)**  
 1. Tell me something about yourself  
 2. A long discussion on project. Brief description. How can you improve it?What changes will make if I ask you to develop it again? Give example of implementation of various oops concept in your project.  
 3. What is multithreading? Then he said that there are situations where there is no need of multithreading.eg- if I want to add two numbers then no point of using multithreading.So give an example where you can actually implement multithreading. (ANS – Fibonacci number)  
 4. Some behavioral questions like-  
 What are you good at?  
 What are you proud of?  
 What are the things you want to change in yourself?etc.

5. Various oops concept like encapsulation, abstraction, inheritance , etc. with example.

**Suggestions:**  
 • Don’t start writing the code immediately.  
 • First tell him the approach .  
 • Take care of all the edge cases.  
 • Many times interview may give you hints so make the interview interactive.  
 • Very Important – Don’t focus just on a particular subject like only DS.  
 • More or less give time to everything.  
 • Study the concepts of OOPS and OS properly.  
 • Have a basic Idea of DBMS and Computer Networks also.

All the best.

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# Amazon Interview | Set 101 (On-Campus)

Off late, Amazon had an On-campus recruitment. Here is the interview process.

**1) Written Round**

1. 20 MCQ’s

* two C code snippets
* a couple of questions of time-dist-speed
* easy questions on operating systems
* find the no.of network addresses of a class C address

two coding questions

* Given a set of inputs (x,y) which represent intervals, merge overlapping intervals  
   e.x. (3,4) ; (2,5) ; (1,4) ; (8,9)  
   output should be – (1,5) ; (8,9)  
   \*note – my code had errors, but as i had used merge sort for sorting the inputs, i cleared the first round, whereas others with properly working code but in-efficient algorithms didn’t
* Given a (nXm) matrix, with values present in each cell and a few in-accessible cells marked as -1, find the path from (0,0) to (n,m) with highest sum.

**2) Interview Round 1**

1. Given an array, find a pair with sum = k  
    \*note – If you already know the approach/already coded a question before, let the interviewer know before hand!
2. Given a regular expression, and a string, validate the string against the regular expression  
    e.x.  
    Regular expression : ab\*bbc\*c  
    Pattern : abbbc VALID  
    Pattern : abc NOT VALID

**3) Interview Round 2**

1. A couple of questions from arrays, binary trees and BST’s , which were directly taken from DS section of geeksforgeeks.  
    (I said I have coded them all and know the approach)
2. Box stacking problem for 2 dimension, 3 dimensions.  
    (I said I know the approach for all)
3. Box stacking problem for k dimensions  
    (I didn’t know the approach, so tried it out in the interview. Nearly reached the solution, with the help of the interviewer. In the end, turns out, this was the same question which was asked to him, during his interview round in amazon 2 years back. “SET 2”)

**4) Interview Round 3**

1. Same question from interview round 1, given an array, find a pair with sum k.  
    But, now I was asked to optimize the solution to O(n) time.
2. Explain how chat-messenger functions in Facebook,Whatssap
3. Validate whether a given 9X9 matrix is a sudoku matrix or not.  
    (In all cases, the goal of this round was not to check your coding skills, but your ability to handle all varieties of test cases!)

**5) Interview Round 4**

(This I believe, was probably a stress interview a.k.a Bar Raiser Round. The motive was to shift your attention from one topic to another rapidly and see if you can handle the questions that follow.)

1. Tell me something about yourself
2. The interviewer asked me to pick up a project from all those I had worked on. I chose my B.Tech project related to Genetic Algorithm and Graphs
3. Explain the algorithm
4. How are graphs being represented in your project
5. Various ways to represent adjacency nodes (adjacency matrix, adjacency list)
6. Write code for adjacency list
7. Write code for reversal of linked list (iterative and recursive)
8. Which one would you prefer, arrays or linkedlist, if so why!
9. Why use double pointers to pass head of a linked list, why can’t we just return the value from the function. Which one do you prefer and why.  
    (As I had done my code using double pointers.)
10. What is a stack and heap, and how is memory allocated
11. Given a step function f(i) whose value increases just once as we move from i = 1 .. infinity,  
     Find the value of i, where the transition occurs.  
     (I suggested increasing the length for checking by a power of 2, and then when a transition occurs, do a binary search within the boundary.)
12. Why increase the length in powers of 2 and not just increase it by a constant factor of some value ‘n’

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# Amazon Interview | Set 102

I had my Amazon Interview some days back and now I am posting my experience here.

**Round 1 (Apt)**

20 mcq question and 2 coding questions were there

Mcq consisted of questions from C, Data Structure, OS, and so on

**Coding Question 1** – Given a String and a pattern find all anagrams of the pattern in the original string. You need to print all the index of the location where the match was found

Ex –

INPUT – ABDACDBACA

ABCD

OUTPUT – 1 3 4 5 (at index 1 BDAC , at index 3 ACDB and so on )

**Coding Question 2** – Given an array containing zero and non zero digits you need to shift all the zeroes to the right of the array. Output should be number of non zero elements present in array and minimum number of swaps needed to do so.

Ex –

INPUT – 1 0 -6 5 0 0 2 0

OUTPUT – 4 (number of non zero elements)

1 (swap 2 with 0 present at index 1)

**1st PI**

Started with a general introduction with the interviewer. Some basic introductory questions like Tell me something about yourself and after we were settled he started asking question

1 . Given a binary tree store the vertical sum of the tree in a list.

2. Given a number you need to output the minimum number of factors needed to represent that number such that none of the factors is divisible by a perfect square.

EX-

INPUT – 8

So number of factors of 8 (2\*2\*2 , 4\*2 , 8) (NOTE : do not consider 1 because it is divisible by all numbers) So minimum factor will be 1 (8) but it is divisible by 4 so not allowed then minimum is 2(4 \* 2) but again 4 is divisible by 4 so not allowed so finally answer is 3 (2\*2\*2)

OUTPUT – 3

You need to explain the logic of both the programs and then have to code both of them

**2nd PI**

General Introduction about myself and asked me my Weakness and strongness and again once we were comfortable started asking questions

1. There are a number of houses in a row and each house contain some amount of money in it. Now suppose you’re a thief and you want to steal money from this houses so find the maximum money you can steal. Condition was that no two adjacent houses can be robbed.  
    After doing this he asked me to also print the houses that were robbed
2. Given an expression consisting of opening and closing parentheses you need to find the number of onions present in it.  
    Onion is any structure of the form ()

* () – onion of size 1
* (()) – onion of size 2
* ((())) – onion of size 3
* So suppose if input is (()()) so output will be 2 because there are only two onions present in it
* Again Complete coding of the two functions was needed
* Then he started asking questions on subjects – OS , Networking and a SQL query

**3rd PI**

Started with introduction and then he gave me question

1. Given an n–ary tree .Print the right view of the tree.  
    After that he added to print the right view in a zigzag way like first element from top element , second from bottom third from top fourth from bottom and so on. Then asked to print both the left and right view of the tree
2. Given an array of 0’s and 1’s print the numbers in the form of Fibonacci sequence i.e. 1st 1 zero then 1 one then 2 zero then 3 one and so on  
    Ex –

* INPUT – 00101111011101011000
* OUTPUT – 01001110000011111110 (Number of 0’s and 1’s in the input and output must be same so if you run out of any of them then just simple print the remaining number)

Coding of both the program’s was needed

**4th PI (Bar Raiser)**

1. Given a list of cities you can travel in an number of city now you need to find the number of ways in which you can travel this cities.
2. Implement the pow function in logarithmic time.
3. Implement a DFA which will accept all string containing even number of 0’s and 1’s
4. Find the 2nd maximum number from a table using SQL query
5. Check whether a grammar is ambiguous or not

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<http://www.geeksforgeeks.org/amazon-interview-set-102/>

# Amazon Interview | Set 103 (On-Campus)

First of all, I would like to convey my special thanks to geeksforgeeks for such a special guidance. Here is my interview experience:

**First day:**  
 ***Round-1 :***  
 20 MCQs(Data structure, C, C++, OS, Probability ).  
 2 programs :  
 1. Given an array of integers. Segregate all the non-zero numbers at the beginning. Print the number of non-zero integers and the minimum number of swaps required for these operations.

Eg. : I/p : 1, 0, 0, -6, 2, 0  
 o/p : Number of non-zero integers : 3  
 Minimum number of swaps : 2

2. Given a text txt[0..n-1] and a pattern pat[0..m-1], write a function search(char pat[], char txt[]) that prints all occurrences of pat[] and its permutations (or anagrams) in txt[]. You may assume that n > m.

E.g. : I/p : txt[] = “BACDGABCDA” pat[] = “ABCD”  
 o/p : Found at index 0  
 Found at index 5  
 Found at index 6

**Second day:**  
 ***Round 2 : PI***  
 1. Discussion on Project.  
 2. Code : Given an array of integers. Find the minimum distance between two numbers.  
 I did it in O(N) time complexity.  
 Then he changed the question and asked what if the array is sorted and contains duplicates.  
 I did it in O(logN) time complexity.  
 3. Given a linked list. Segregate all the positive numbers at the beginning and all the negative numbers at the end.  
 I did it in O(N) time complexity.

***Round 3 : PI***  
 1. Discussion on project.  
 2. Code : LCA of BST.  
 3. Code : LCA of Binary tree.  
 4. Discussion on heap and stack.  
 5. Code : Maximum subarray sum.  
 6. Os concepts : What is semaphore? Brief explanation on wait() and signal() operation.

***Round 4 : PI***  
 1. Discussion on oops concept. Asked me about copy constructor, virtual function, virtual class,  
 Template, exceptional handling.  
 2. Discussion on Os concepts. Semaphore, different page replacement algos.  
 3. LRU implementation using stack ( I was not allowed to use any other data structure).  
 I did it using two stacks.  
 4. It was a modification of this question.  
 Our chef has recently opened a new restaurant with a unique style. The restaurant is divided into K compartments (numbered from 1 to K) and each compartment can be occupied by at most one customer. Each customer that visits the restaurant has a strongly preferred compartment p (1 ? p ? K), and if that compartment is already occupied, then the customer simply leaves. Now obviously, the chef wants to maximize the total number of customers that dine at his restaurant and so he allows (or disallows) certain customers so as to achieve this task. You are to help him with this. Given a list of N customers with their arrival time, departure time and the preferred compartment, you need to calculate the maximum number of customers that can dine at the restaurant.

Instead of restaurant and customers, I was given platforms and trains.

I was asked to design a data structure for that.

**Third day :**  
 ***Round 5 :***  
 1. Discussion on project.  
 2. Discussion on different types of sorting techniques.  
 Difference between merge sort and quick sort. When and where are they used.  
 Discussion on counting sort.  
 3. Discussion on hash-map.  
 Design a data structure which will provide the same function as hash-map.  
 4. Code : Given an array : A1[] = 2, 1, 2, 5, 7, 1, 9, 3, 6, 8, 8  
 A2[] = 2, 1, 8, 3  
 Sort A1 in such a way that the relative order among the elements will be same as those are in A2. If the element is not present in A2, append them at last in sorted order.  
 o/p : 2, 2, 1, 1, 8, 8, 3, 5, 6, 7, 9  
 I did it O(NlogN) time complexity.

***Round 6 : (Bar-Raiser)***  
 1. Code : Convert little endian to big endian.  
 2. Code : Kth max in a file.  
 I did it using min-heap, then he sked me to use other data structure. Then I did it using Balanced binary search tree.  
 3. Code : Find the second non-repeating character in a string.  
 4. Given prime number p>=5 :  
 Prove that : (p^2 – 1) will be divisible by 24.  
 5. Given a decimal number N as a string of digits (only 0’s, 1’s and 2’s are there), how do I check if it’s divisible by 3 using regular expressions only, without converting to int? I was asked to design DFA for that.

I would like to thanks GeeksForGeeks which helped me to improve my knowledge and understanding of Data structures and Algorithms

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# Amazon Interview | Set 104

**Online round:**  
 20 MCQs on mathematics, probability, operating systems, DBMS, compilers and basic DS concepts.

**Coding questions (Full code required):**  
 1. Given an array containing zero and non-zero elements, modify the array such that it has the 0’s at the end and the non-zero elements at the beginning. Print the number of swaps required and the number of non-zero elements.

2. Given a ‘pattern’ and a ‘text’ print the indexes of ‘text’ where any anagrams of ‘pattern’ occur.

Input:  
 abcdad (text)  
 abcd (pattern)  
 Output:  
 0, 1

**1st technical:**  
 1. Given a linked list reverse the even nodes in one pass and in O(1) space.  
 So 1->2->3->4->5->6->7->8 should be converted to 1->8->3->6->5->4->7->2.

2. Given an array containing integers, modify the array such that the 5’s are at the end and the rest are at the beginning (maintaining the same order).

**2nd technical:**  
 1. 5 minute discussion about my OCR project.  
 2. Given an undirected graph, count the number of cycles with 3 nodes.  
 3. What is a spanning tree? Difference from tree, if any.  
 4. How to find the minimum spanning tree of a graph?  
 5. Given an array convert it to another array such that the following condition holds:  
 a c e g where the modified array is {a,b,c,d,e,f,g,h}  
 Input:  
 1,2,3,4,5,6  
 Output:  
 1,3,2,5,4,6

**3rd technical:**  
 1. What do you know about memory management in Operating Systems? What is segmentation? What is paging?

2. Design problem: Given a station with n platforms. So each platform has one line. But these n lines join into one, after leaving the platform (on both sides). Each train has to wait a minimum of x minutes in the platform. Trains arrive from both ends. If all the platforms are occupied they wait. There is also a point beyond the end of the platform (on both sides). This point indicates that an incoming train has to wait at that point until a leaving train (from that end) passes that point. Design the whole system.

3. How are big files stored in memory? What are the uses of B-tree? How is it more useful than BST?

4. Given one billion file indexes and said that n files are missing. How would you identify the file indexes of those who are missing?

**4th technical:**  
 1. Given an array of integers. This array denotes ‘our’ own ascending order of the elements. So if the array is {2,3,1,4}, by mathematics we can say that 2 Let’s say the new array is {1,2,4,3,5,4,9,2}, output will be {2,2,3,1,4,4,5,9}. Note that since 5 and 9 do not occur, they are sorted by actual ascending order at the end.

2. Integers are coming in a stream. A special integer (say -9999) denotes reset. Design a data structure such that when the special integer comes the previous elements are printed in a zigzag way and all the elements are deleted (reset). And then continues to accept other integers. What DS will you use?

Say the input is  
 1,2,3,4,5,6,7,8,-9999,0,1,100,-9999,-9999,500  
Output will be  
 1,8,2,7,3,6,4,5  
 0,100,1

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<http://www.geeksforgeeks.org/amazon-interview-set-104/>

# Amazon Interview | Set 105 (On-Campus)

**Written Round:**

20Q questions on C, data structures , some aptitude questions and other related concepts.

2 coding questions :

1. Merge overlapping intervals. This question has come many times so I am not repeating it.
2. Given a singly linked list you have to subtract the value of first node from the last node and so on until you reach the middle node.

Eg 5 -> 4->3->2 ->1

Output : 4->2->3->2->1.

**First PI:**

1. A brief discussion on my projects that I have done .

2. One thing that I am most proud of , a discussion on this .

3. Given an array you have to write two functions:

a.) getMinimum();

b.) upate(index, value);

A detailed description on my approach , I gave him 2-3 approaches which were not satisfactory , He told me to give it a fresh thought , then I have him a solution . He was satisfied and then he asked me to code it.

4. Some basic questions on operating system concepts like CPU scheduling, why CPU scheduling , advantages , types. Questions on deadlock.

**Second PI :**

1. Tell me about yourself.
2. Discussion on graph data structure , then asked me to find number of three node cycles in a graph .Write code.
3. Given a string , find minimum distance between two given characters of the string, write code.

A detailed discussion on its complexity and the code I wrote.

**Third Round :**

1. A detailed discussion on my projects.
2. What happens when you type in a url .
3. Suppose that a user reports that your website is taking a long time to load , suggest possible remedies .
4. Difference between TCP and UDP.
5. Implement LRU cache. Code required.
6. A simple question on doubly linked list . Code Required .

**Fourth Round( Bar Raiser /BR Round):**

It was a telephonic round . I was given a design problem . We have a customer using amazon Kindle , suppose he wants to borrow a book for some days , lets say x and wants to finish reading the book within the days limit. The book contains ,lets say y chapters ,once he starts reading a chapter he has to finish that on the same day . He can read the book only in a sequential manner , you have to tell how many chapters should he read on each day so that he can finish reading the book .

A discussion on my approach and

Then he asked me to write a code for it.

Then he asked me some HR related questions .

1. Quote some example when you have motivated your team .
2. Quote some example when you have led down your team .
3. What projects and subjects are you interested into.

And some others, I don’t remember.

It was an amazing experience, I learned a lot from it. Thanx a lot to GeeksForGeeks, you have helped me a lot.

**Suggestions / Tips :**

They need a code for whatever algorithm you are telling them, so be specific, take your time to jump to a conclusion .Discuss whatever you have in your mind , everything you discuss matters and creates an impact , they will also guide you at times, and stay cool and relaxed, clear any doubts you have. And an important thing is to try to justify each and every thing you say, that matters a lot.

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<http://www.geeksforgeeks.org/amazon-interview-set-105-campus/>

# Amazon Interview | Set 106 (On Campus for Internship)

Amazon came to our campus recently for placements and internships. I attended for internship and i am sharing my experience here.

**First Round: Online:**  
 20 MCQs based on basic aptitude,OS,C programming and data structures.  
 2 coding questions:  
 1st: Consider a coordinate system consisting of n coordinates from (x1,y1)…..(xn,yn)  
 Also there are two values ymin and ymax given to you. You have to return min(D) where D is x^2 + y^2 for all y lying between ymin and ymax inclusive. If there is no such y then return -1.

2nd: Given a number n and a number k. You have to find the next bigger number from n which is obtained after exaclty k swaps.  
 Eg: Take n=43592169 and k=5  
 1st swap: 43952169  
 2nd swap: 49352169  
 3rd swap: 94352169  
 4th swap: 94532169  
 5th swap: 95432169 :- final number.

**First Interview:**  
 1. Check if a linked list is palindrome or not.  
 2. Given an array of n integers(positive or negative). Find the maximum sum of subsequence of the array and also total number such arrays possible having the maximum sum.

**Second Interview(Final):**  
 1. A linked list consists of two pointers: a next pointer and a child pointer. We have to make the linked list linear i.e. making all the child pointers NULL.

eg: 1->2->3->4  
 | |  
 5->6 8  
 |  
 7  
answer would be:  
 1->2->3->4->5->6->8->7.

2. Given a distance n. A person standing at position 0 has to reach n. He can either take 1 step or 2 steps at a time. In how many ways he can reach there.

Finally some definitions from OOPS, OS and basic data structures.

I was finally hired for the Internship at Amazon. I would like to thanks Geeks for Geeks which helped me a lot in my preparation.

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<http://www.geeksforgeeks.org/amazon-interview-set-106-campus-internship/>

# Amazon Interview | Set 107 (For SDE-1)

I finished interviews at Amazon few days back. Here is my interview experience:

**Telephonic round (Screening):**  
 1) Discussion around work in current company. Why Amazon?  
 2) You are given an infinite sorted array containing only numbers 0 and 1. Find the transition point efficiently.  
 3) He gave me some function and asked me to arrive at the complexity of it.

**F2F-I:**  
 1) Brief discussion on work in current company  
 2) Flatten linked list – http://www.geeksforgeeks.org/flatten-a-linked-list-with-next-and-child-pointers/  
 3) Design a data structure which holds number 1 to n such that insert, remove(this operation will take in a number between 1 to n as argument and remove that number from data structure if it exists) and get valid element in the data structure operations are done with O(1) complexity  
   
 **F2F-2:**  
 1) Brief discussion of work in current company  
 2) Find and print longest consecutive number sequence in a given sequence

Ex: Input: 1 2 5 3 6 8 7  
 Output: 5 6 7 8

3) A fair die is thrown k times. What is the probability of sum of k throws to be equal to a number n?

**F2F-3:**  
 1) Brief discussion of work in current company. Why Amazon?  
 2) Why do you want to leave current company? What do you like most and dislike most about your current company?  
 3) Sum two numbers represented by linked list iteratively and recursively.  
 4) You are given an infinite sorted array containing only numbers 0 and 1. Find the transition point efficiently.

**F2F-4:**  
 1) Lots of HR, behavioral and team fit questions  
 2) User statistics are logged in the following format –

user\_id|page|time at which page was accessed  
 We need to identify most followed 3 page sequence by users.  
 Example:  
 Input: U1|Page1|05/08/2014 10:00  
 U1|Page2|05/08/2014 10:01  
 U1|Page3|05/08/2014 10:02  
 U1|Page4|05/08/2014 10:03  
 U2|Page2|05/08/2014 10:02  
 U2|Page3|05/08/2014 10:04  
 U2|Page4|05/08/2014 10:05  
 U3|Page3|05/08/2014 10:04  
 U3|Page4|05/08/2014 10:05  
 U3|Page5|05/08/2014 10:06  
 Output: Most followed 3 page sequence for the input is   
 Page2 -> Page3 -> Page4.

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<http://www.geeksforgeeks.org/amazon-interview-set-107/>

# Amazon Interview | Set 108 (On-Campus)

Dear, I just got hired by Amazon in my campus placement drive. Below are the details of my selection process with amazon.

**Fist Round(Online):**  
 20 MCQ questions and 2 Coding Questions .  
 Coding Questions :  
 1. Merge overlapping intervals(Very well known repeating problem).  
 2. Given a singly linked list you have to subtract the value of first node from the last node and so on until you reach the middle node.  
 Eg: Input: 5 -> 4 -> 3 -> 2 -> 1  
 Output: 4 -> 2 -> 3 -> 2 -> 1

**F2F-1:**  
 1) Given a sorted circular link list and a pointer to random node, now insert a new node. I did it , but i used if and else for some special cases in my code so he asked me to do it without if else for special cases (generic & simple code ).

2) Given a pointer to node in tree and a root pointer. Print all the nodes which are at a distance k from the given node.

**F2F-2:**  
 1) He gave me task scheduling problem:  
 Given a set of modules, some modules depend on previous modules and can only be executed, if the requirements of that module is complete.

Eg: module A depends on module B,C   
 module B depends on module C and D  
 module C depends on E  
 module E depends on D  
 module D doesn't depend on any other module

so he asked me to give a schedule for above modules such that when a module is executed then all requirements of that module are complete.  
 so answer would be D E C B A

2) Given a string of letters from alphabet. Remove all pairs(2 consecutive same character) of characters which occur consecutively.And do it recursively on remaining string.

Eg given string abcdaadhhhhhzppzl  
 then output string should be : abchl

Hint: He asked me to use some data structure for it .

3) Given a binary tree set the sibling pointers . I told him that i already know the question so he said code it .

4) He asked me about hashing .  
 4.1 He asked me about complexity . I told him about O(logn) and O(1) .  
 4.2 Then he asked me about how do you get O(1). I told him my approach . He said how will you rehash it when required . I told him that i will use extra memory and copy the hash map . Then i Optimized and did it in-place using a Boolean field.  
 4.3 Then he took this question to OS and asked me to do it using threads .  
 4.4 Asked me what all problems you will need to take care about this problem while using threads and give solution to it.

5) Discussion on my projects

**F2F-3:**  
 He gave me 3 coding questions :  
 1) Given a number n find the number of valid permutations of a string formed using characters ‘(‘ and ‘)’ . A string is valid if it has matching opening and closing parenthesis .  
 Eg: given n=2 so you can have 2 possible permutations which are valid (()) and ()() .

2) Given a singly link list reverse every 3 nodes and if nodes are less than 3 then reverse them also.

Eg: Input: 1->2->3->4->5->6->7->8  
 Output: 3->2->1->6->5->4->8->7

3) Given a string of letters from alphabet insert frequency of each character in the string.

Eg: Input: aaabbbccdefgggaaa  
 Output: a3b3c2d1e1f1g3a3

Time Complexity Required O(n) Space Complexity Required O(1)

**Fourth Round (Bar Raiser):**  
 It was a telephonic round with a collabedit screen shared on our laptops.

1) Tell me something about yourself .

2) He saw that i had given a seminar on cloud computing and sky computing so he started with cloud computing .Then he asked me why didn’t cloud computing exist 15 years ago .

3) What do you understand by 32 bit and 64 bit OS ? . He asked for explanations in terms of hardware and software . Then he asked me that will a 16 bit program run on 64 bit OS without any problem . He asked me what can be the reason for problem faced .

4) What happens when you type www.amazon.in in your browser ? . He asked me for the set of activities that take place during this time . Then he went into asking how do you get to know the IP address of your ISP . Then after a lot of discussion he was satisfied .

5) Some questions about Complexity of a algorithm . Asked me to prove complexity of few sample codes .

6) Some questions about storage space of a variable( data segment , stack , heap , BSS ). Some questions about Macro preprocessors and there problems & solutions .

7) Some questions about error in sample code given (like returning non compatible pointer type or returning address of a local variable etc )

8) In DOS and Linux shell when we press the up arrow we get the recently used commands . He asked me to implement this facility. Then he asked me to do it if memory bound was very tight .

9) This was a question to check my analytic skills . We have customers using www.amazon.in for buying phones. Let say we have a user who visits www.amazon.in for buying mobile phone . He selects a mobile then fills his address details and then when he finally goes for payment then he gets to know that this phone is not available . So how can you improve the over all user experience . Then he asked me that will you suggest redirecting the user to some other site if the product is out of stock .

10) Some HR Questions like What are your areas of your Weaknesses ? What are you doing to improve on them ?

It was an amazing experience. Thanks a lot to GeeksforGeeks for helping me get my dream job 

**Suggestions/Tips :**  
 1) Discuss your approach as many times as possible.  
 2) Don’t start Coding the problem until the interviewer asks you to do it.  
 3) Tell everything that you are thinking about the problem. They are more interested in knowing how you are approaching the problem.  
 4) Asks for hints if you are stuck up. They will help you.  
 5) If you don’t know answer to a question then please say it directly. It will save time for other questions.  
 6) First be confident about your approach then only code it.

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<http://www.geeksforgeeks.org/amazon-interview-set-108-campus/>

# Amazon Interview | Set 109 (On-Campus)

Amazon visited my Campus a few days back. I did not clear the final round of Amazon but I got selected in D.E. Shaw the very next day after rejection from Amazon   
 Here is my interview experience of Amazon.

**Online Round (conducted on HackerRank):**  
 20 MCQ questions and 2 Coding Questions (no C++ questions, C input-output questions(very hard) and aptitude questions).  
 Coding Questions :  
 1. Merge overlapping intervals(Very well known repeating problem).  
 2. Given a singly linked list you have to subtract the value of first node from the last node and so on until you reach the middle node.  
 Eg: Input: 5 -> 4 -> 3 -> 2 -> 1  
 Output: 4 -> 2 -> 3 -> 2 -> 1

Advice: Many people say that making 1 code is enough to clear the 1st round while this is not true, I made both the codes and many of my friends who made only one code were rejected. Everyone who made both the codes were selected. There were some students who cleared this round by making only one code but don’t try your luck here by making only one code is my suggestion.

**Round 1(Bar Raiser):**  
 Complete discussion on my project.  
 Suppose you have a file with billion entries and you have to sort the data of a file according to a column and can put only that column in memory and after putting that your memory gets full.  
 e.g. your file contains  
 name age address pincode sex  
 ….. …. … … …  
 And you can have to sort the file according to pincode then you can only put pincode in the memory.  
 I approached it firstly by using merge sort but this requires the entire file to be put into memory. Then, I suggested using min heap but he said that heapify process of billion numbers will take a lot of time. He said you are getting close, then I suggested that we can use a balanced binary search tree to store the pincodes along with indexes and then traverse the bst in inorder fashion and swap the indices of the first pincode of file with the index of inorder element. He was happy after hearing this and asked me to write the code and to be careful with edge cases.  
 I did it.

**Round 2 (CS Fundamentals)**  
 He wanted to check my knowledge of DBMS, OS, and Computer Networks. Asked everything related to these subject including all the layers of networks and from process-threads to deadlocks to memory management in OS. Asked a SQL query to find 3rd maximum marks of student from a database. I gave him 2 solutions  .  
 Asked me my favorite sorting algorithm. My favorite is insertion sort but I told him merge sort because I knew a lot about merge sort so I wanted to drive the interview towards merge sort and as expected he asked many questions on merge sort and I gave him all the answers.  
 He asked me to build a tree from given preorder and postorder traversal of tree, I said it is impossible to build from only these 2 traversals , you have to give me inorder to build a unique tree.

**Round 3 (CS Fundamentals + Coding)**  
 Deep discussion about project.  
 Asked me to choose my favorite subject other than any related to coding or algorithms. I said Computer Networks. He asked why it is your favorite ? Why not OS or DBMS?  
 He asked me What happens when you type www.amazon.in in your browser. I was expecting this question  . I knew this, told him everything.  
 See the links below for solution  
 <http://igoro.com/archive/what-really-happens-when-you-navigate-to-a-url/>  
 <http://superuser.com/questions/31468/what-exactly-happens-when-you-browse-a-website-in-your-browser>  
 <http://edusagar.com/articles/view/70/What-happens-when-you-type-a-URL-in-browser>  
 He asked me to solve a coding problem now.  
 Suppose I am given a sorted array of unknown size, then how will I search an element in this array efficiently.  
 I said I can increase int i by the power of 2 and check whether the given arr[i] > element to search whenever I find such element then I can apply binary search between i/2 and i. He said this approach will work but what happens if while increasing i , you cross the array length. Suppose an array is of size 6 , then your i will become 8 and arr[8] will give garbage value so your program may go in an infinite loop. I said I can increase i in try block and whenever this case occur then I can catch the exception in catch block where I will decrease i by 1.  
 He smiled and asked me to write the code by taking care of edge cases.

**Round 4 (Coding)**  
 Deep discussion about the project which was on security. The interviewer asked me to design the database of a chat application similar to whatsapp. I did it and said what if some intruder access the database, then I said I will apply md5 encryption on phone numbers, then he asked me how md5 works. Why only md5? He asked me what are Man in the middle attacks and asked me to remove man in middle attacks from the message transfers. He was impressed.   
 He then asked me what is cache, why are cache fast and how it differs from RAM and hard disk architecturally. This one was a bouncer, I hated computer architecture, admitted I am a beginner in computer architecture. He laughed and said thank god, there is one thing in which you are a beginner. I laughed too 

He moved further towards coding.  
 1. Suppose the structure of a binary tree is

struct node { int val;   
 struct node \*left,\*right,\*random;  
 }node;

Where random pointer points to any random node of the binary tree and can even point to NULL, then how will you clone this tree.  
 This was the culprit question who led to my rejection.  
 I gave a lot of thought to it, but wasn’t able to solve it directly. I said we can use hash, then he said what if there are duplicates in the tree then your hash will fail, then I said we can convert the binary tree to doubly link list in place then clone the doubly link list, he said ok but how will you generate the original tree from doubly link list, I never said it was balanced. I gave a lot of thought here, nut yeah couldn’t solve it.  
 I got the solution by trying it after the interview, you can clone the left and right pointers easily by traversing the tree and to clone the random pointers, you can apply this : newroot->random=oldroot->random; oldroot->random=newroot;  
 Then traverse new tree again and put newroot->random=newroot->random->random.

2. <http://www.geeksforgeeks.org/find-the-row-with-maximum-number-1s/>

I solved it efficiently.

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<http://www.geeksforgeeks.org/amazon-interview-set-109-campus/>

# Amazon Interview | Set 110 (On-Campus)

Hi, Amazon visited our campus few days back. Before I start off with my experience, here are few suggestions.

1. Don’t just go through the codes. First try it on your own, that’s very important. Once u have cracked a problem, write it in a paper and check for the corner cases.

2. For the online round. [GeeksQuiz](http://geeksquiz.com/)is enough to get you through the MCQs. For the coding part, once u have cracked a problem, always try to run the program at one go.

3. OS, DBMS and Networking. If you get a good hold on these subjects, it will make you stand apart from other candidates.

**First day:**  
 20 MCQs(Data structure, C, C++, OS, Probability ).  
 2 programs :  
 1. Given an array of integers. Segregate all the non-zero numbers at the beginning. Print the number of non-zero integers and the minimum number of swaps required for these operations.

Eg. : I/p : 1, 0, 0, -6, 2, 0  
 o/p : Number of non-zero integers : 3  
 Minimum number of swaps : 2

2. Given a text txt[0..n-1] and a pattern pat[0..m-1], write a function search(char pat[], char txt[]) that prints all occurrences of pat[] and its permutations (or anagrams) in txt[]. You may assume that n > m.

E.g. : I/p : txt[] = “BACDGABCDA” pat[] = “ABCD”  
 o/p : Found at index 0  
 Found at index 5   
 Found at index 6

**Second day:**  
 Suggestion: Always think loud when you are coding  
 ***Round 1 : PI 45 min***  
 1. Discussion on Project.  
 2. Code : LCA of a BST.(check for all corner cases)  
 3. Code : LCA of a Binary Tree(check for corner cases)  
 4. Code : Maximum sum subarry along with its starting and ending index.  
 5. Code : Heap operations

***Round 2 : PI (With Manager) 1 hr 15 min***  
 1. Discussion on project.  
 2. Code : Given an array : A1[] = 2, 1, 2, 5, 7, 1, 9, 3, 6, 8, 8  
 A2[] = 2, 1, 8, 3  
 Sort A1 in such a way that the relative order among the elements will be same as those are in A2. If the element is not present in A2, append them at last in sorted order.  
 o/p : 2, 2, 1, 1, 8, 8, 3, 5, 6, 7, 9

As I carried on telling him the approach, he went on modifying the question ( what if A2 is much larger than A1 ?, what if they are of the same size ?)

A lot of discussion on complexities for all modifiactions. He was quite happy with my answers.  
 Finally he asked me to code the O(nlogn) approach.

***Round 3 (Subject Round) 1 hr***  
 1. OS : Virtual Memeory (lot of discussion of its advantages, thrashing , etc)  
 Then he asked me design a LRU replacement policy(approach) which i did. Then he asked to implement FIFO replacement policy with stacks. I did it using two stacks.

2. Neworking : He started with Transport Layer( discussion on ports. How data from applications are changed into packets ?, etc).  
 Then he went to Network Layer (A lot of discussion on subnet masking and how it is used by routers to map the IP address of incoming packet, how a Subnet is different from Internet).  
 Next we moved to Data Link Layer( Discussion MAC addresses, sliding window protocols, etc).

3. DBMS: What is indexing?, Why indexing ?, How to implement indexing ?, What are the different types of Index? .  
 Differences among Inner Join, Left Outer Join and Right Outer Join. He followed it up with a SQL query on Outer Join.

As my first three rounds went very well, fourth round was of 15 minutes only.

***Round 4 (Bar Raiser) 15 min.***  
 1. Logical question. Given a prime number ‘p’. Prove that p^2-1 is always divisible by 24.  
 2. Find 2nd maximum element in a given array in one iteration.

All the best !

GeeksforGeeks has helped me throughout my preparation. This is the best site for clearing your concepts on Data Structures and Algorithms. [GeeksQuiz](http://geeksquiz.com/)has helped me to get through the MCQs in the online round. Thanks again !

Keep Smiling !

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<http://www.geeksforgeeks.org/amazon-interview-set-110-campus/>

# Amazon Interview | Set 111 (On-Campus)

Amazon visited our campus, these are the questions that I faced.

**Online Round (90 minutes)**

20 MCQs(Data structure, C, C++, OS, Probability ).  
 2 programs :  
 1. Given an array of integers. Segregate all the non-zero numbers at the beginning. Print the number of non-zero integers and the minimum number of swaps required for these operations.

Eg. : I/p : 1, 0, 0, -6, 2, 0

o/p : Number of non-zero integers : 3

Minimum number of swaps : 2

2. Given a text txt[0..n-1] and a pattern pat[0..m-1], write a function search(char pat[], char txt[]) that prints all occurrences of pat[] and its permutations (or anagrams) in txt[]. You may assume that n > m.

E.g. : I/p : txt[] = “BACDGABCDA” pat[] = “ABCD”

o/p :0,5,6

**1st PI**

1. About 10 minute discussion on my project on Cloud Platforms and Big Data Analysis in Yahoo SDC. I asked him some doubts and he answered them clearly.
2. Given a string of digits, output all the dictionary words they can represent. (Basically smart dial algorithm of an android phone). Each digit represents the corresponding characters on a cellphone as follows.  
    [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/phone.png)  
    e.g. : I/p : 3323 O/p : DEAD , DEAFFirst, he asked me how I would store the dictionary. When he was satisfied by my approach, he asked me to write a recursive function that would do the job if a dictionary is given as an input.
3. Then he gave me a class design. He went on changing his requirements and I was asked to add support for them in my implementation. At first, his requirement was to draw a rectangle and a circle. Then he went on adding requirements and finally it was to draw different specializations (like curved-edges, skewed-edges, dashed-lines) of rectangles, triangles and circle. He gave a constraint that support for a new specialization can be added easily in my design.

**2nd PI**

1. Given, the starting and ending time of different meetings, what is the minimum number of conference rooms that will be enough to accommodate all of them.He asked me to code it.E.g, :

* I/p : Meeting I – 8:30 – 12:50
* Meeting II – 10:15 – 11:30
* Meeting III – 11:45 – 1:30
* O/p : 2

1. Implementation of a doubly-linked list using a single pointer. I didn’t know the answer at that time. He gave me a few hints and I was able to solve it. Then he asked me to code it.

**3rd PI**

1. Given an array of integers. This array denotes ‘our’ own ascending order of the elements. So if the array is {2,3,1,4}, by mathematics we can say that 2<3<1<4. Given another array, sort this new array in ‘our’ ascending order.  
    Let’s say the new array is {1,2,4,3,5,4,9,2}, output will be {2,2,3,1,4,4,5,9}. Note that since 5 and 9 do not occur, they are sorted by actual ascending order at the end.
2. Return the left-view and right-view of an n-ary tree in a single traversal.

**4th PI**

1. 10 minute discussion about my internship in Cloud Platforms team in Yahoo SDC. He asked me a few HR questions like what do you think was your biggest screw-up in college life, etc.
2. Find power(a, n) iteratively without extra space in O(log n) time. He gave me a lot of hints. But unfortunately I couldn’t solve it.
3. Pre-order traversal of a binary tree without using recursion.

Fortunately, I was selected as an FTE in Amazon.

**Suggestions**

I would like to give a few suggestions to all the upcoming candidates :-

1. Firstly, mugging up of codes will never take you far. If you find a problem that is solved in geeksforgeeks, rather than blindly mugging up the code, read the description properly. Try to understand what is being done and why is it being done. Try to understand each and every line of code. It is naïve to expect common known questions in interviews. But, if you can understand the approach of the codes solved in geeksforgeeks, you can use it to solve a plethora of problems.
2. In an interview, always think out loud. Explain what you are doing and why you are doing it. If you solve a problem within a few minutes without explaining your steps, the interviewer will assume (perhaps not incorrectly), that you have mugged up the code. This creates a very bad impression.
3. Follow proper etiquettes. Shake the interviewer’s hands while entering and while leaving the room. Also, try to ask proper questions to the interviewer when he gives you the chance to do so. These are the small things that set you apart from the other interviewees.
4. Lastly, never be too tensed. Always remember, rejection is a part of life. Luck matters a lot in job interviews. So don’t be disheartened if you are rejected. You can always apply later.

A very best of luck to all of you for your upcoming interviews.

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<http://www.geeksforgeeks.org/amazon-interview-set-111-campus/>

# Amazon Interview | Set 112 (On-Campus)

Amazon visited our campus and was hired as intern. These are the questions that I faced.

**Online Round (90 minutes)**  
 20 Basic MCQs (Data structure, C, C++, OS, Aptitude, Networks).  
 2 programs :  
 1. Given a text txt[0..n-1] and a pattern pat[0..m-1], write a function search(char pat[], char txt[]) that prints all occurrences of pat[] and its permutations (or anagrams) in txt[]

E.g. : I/p : txt[] = “BACDGABCDA” pat[] = “ABCD”  
o/p :0,5,6

2. There is a matrix mat[m][n] with entries as 0 or 1 When you are at 1 you can move in all the eight directions and when at 0, you have to return back. Find the number of cluster of 1’s

e.g. input { {1,1,0,0,0},  
 {1,0,0,1,0},  
 {0,0,0,1,1},  
 {1,0,1,0,0} }  
output 3  
  
clusters ((0,0),(0,1),(1,0))   
 (1,2),(2,2),(2,3),(3,2)   
 (3,0)

**Round 1:**  
 1) Introduce yourself.

2) Any moment when you worked really really hard to solve a problem.

3) Find the best fit for a packet to be fitted in a rack rack sizes are given in increasing order in other words find the ceil value of a key in sorted array.

4) Check given binary tree is BST or not

5) Find the lowest common ancestor in binary tree

6) If I have any question to ask him

**Round 2:**

1) Find largest sum contiguous subarray in goven array

2) If I had any question to ask him

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# Amazon Interview | Set 113 (On-Campus for Internship)

Amazon visited our campus to offer internship for 6 months. There were 3 rounds – an online coding round and 2 face to face interviews.

**Online coding Round(Duration:1 hr 30 mins)**  
 This round was conducted on hackerrank.com. There were 20 mcq’s related to computer science and aptitude.Many of these questions are there in the MCQ section of GeeksForGeeks. And there were 2 coding questions:

1. Given a txt[0..n-1] and pat[0..m-1], write a function search(char txt[],char pat[]) that prints all occurences of pat[] and its anagrams in txt[].

Assume that n>m.   
Example: txt[] = “BACDGABCDA” pat[] = “ABCD”  
Ouput: 0 5 6

2. (Cluster Program) You are given a 2d matrix containing 0s and 1s. From a given position in matrix, you can move in all the 8 directions i.e. (i+-1,j),(i,j+-1),(i+-1,j+-1). You have to print the number of clusters of 1’s in the matrix. Two 1’s lie in a cluster if and only if we can move directly from one 1 to another.

Input : m=5,n=5.  
Mat[] = 1 1 0 0 0  
 0 1 0 0 1  
 1 0 0 1 1  
 0 0 0 0 0  
 1 0 1 0 1  
Output : 5  
First: (0,0),(0,1),(1,1),(2,0)  
Second: (1,4),(2,3),(2,4)  
Third: (4,0)  
Fourth: (4,2)  
Fifth: (4,4)

**Face to Face Interview-1(Duration:1 hr)**  
 Interviewer started asking questions straight away without any introduction. He asked me the worst case complexities of Quick sort and Merge sort. Then asked me 2 questions related to trees:  
 1. Given an array that contains post-order traversal of a binary tree. Can you construct a single tree? I said no. Then he asked if i can make a binary search tree from the array to which i said yes. Then after discussing the approach, he asked to write the code.

2. Then he asked me to write the code for level-order traversal of a tree. Also asked me to calculate the complexity of the code.

**Face to Face Interview-2(Duration:about 1hr 30mins)**  
 Interviewer started with the general introduction. Then he started asking questions.  
 1. Given n appointments with the start time, end time and a boolean variable hasConfilct, we have to set the boolean variable hasConflict of those appointments that conflict with the other appointments.

Example: Appointment1: (2:00-3:00)  
 Appointment2: (2:30-3:30)  
 Appointment3: (4:00-6:00)

I have to set the the hasConflict of Appointment 1 and 2 as true.  
 Initially, I did it in O(n^2). But then he asked me to optimize the solution. After some discussion, I was able to solve it in O(nlogn).

2. Given that at Amazon.in the details page of an item shows only one field that is dynamically picked up from the database, we have to improve the performance according to the line:  
 “80% of the users visit details page of 20% of products.”  
 I said we could store these 20% on the web server so that we don’t have to fetch the item details from database everytime. He asked me where and how will i store it. I answered Main memory and will use BST to store it. Then after a lot of discussion(about 30 mins) on how will the get and put operations be used, he was satisfied with the solution.

3. Given a linked list placed in memory, what problems can arise if simultaneous operations are performed on the list. From here he started asking about threads because the answer was related to it.

4. When a single threaded application is converted to multi-threaded applications, what kind of changes operating system has to make?

5. What steps are taken when the os shifts from one-thread execution to another?

Finally, I was hired. Thanks to GeeksForGeeks for helping me throughout my interview preparation.

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# Amazon Interview | Set 114 (On-Campus for Internship)

Recently Amazon India visited our campus for 2 months internship. There were three rounds

**2 online coding questions + 20 MCQ**

The MCQ questions were mainly 6-7 questions on data structures, 7-8 C language output programs, 4-5 questions on general aptitude, Probability, Permutation and Combinations.

The two questions were:

a. Given a set of intervals, you have to group the overlapping intervals and display all the intervals in non decreasing order.  
 Eg: (1,5),(8,11),(3,6),(10,20)  
 output: (1,6),(8,20)  
 Tip: Although this is a very easy question and can be found on many online portals, just remember that the given input is in the form of a string and it needs to be parsed carefully.  
 For this, instead of converting the string into integers, you could use something like

while(scanf("(%d,%d),",&a,&b))  
{  
//store a and b as you wish to  
}

b. Given a set of integers, negative as well as non negative, You need to rearrange them such that negative and non negative integers at alternate positions.  
 Constraints: order of all the negative and nonnegative integers must be the same as before if there are more negative integers, the integers in excess should occur at the end of the array and same goes for the non negative integers in case they are more in number.

eg: -5,-2,5,2,4,7,1,8,0,-8  
output: -5,5,-2,2,-8,4,7,1,8,0

Again, for the input, you can use the above mentioned technique.

About 20 out of 150 students were selected after this round for Personal Interviews.

Following are the interview experiences of two of us.

**Person1:**  
   
 ***ROUND 1:***

1. Given a binary tree having 3 pointers, left, right and sibling out of which all the left and the right child pointers are already filled, you need to fill the sibling pointers with the addresses of the next node on the same level. If it is the last node of a level, fill NULL.

I first told him an approach using a level order traversal with a queue. Then he asked me to do it without a queue using recursion. I told him the approach and when he was satisfied, he asked me to write a code on paper with all the corner cases covered.

2. Given an array of size 2n+1 where n integers repeat two times and one integer occured only once, Find that integer. I told him by using XOR. then he changed the question to  
 Given an array of size 2n+2 where n integers repeat 2 times and 2 integers come only once. Find both of them. This can also be done using XOR. You can find the solution in the arrays section of Geeks for Geeks

3. Given any binary tree in which all the leaves had their left and right pointers connected in a doubly linked list from left to right instead of pointing to NULL. Also, the leftmost leaf’s left pointer pointed to that node itself and the rightmost leaf’s right pointer pointed to that leaf itself and if there was an internal node with no left or right child, that particular pointer will point to that node itself.  
 You need to find the Inorder Traversal of the tree.  
 Once I told him the approach, he again asked me to write a code on paper.

4. He asked me about the data structures I knew and then started asking questions on Graphs. How we represent them?  
 which is better Adjacency matrix or List?  
 Then he gave some situations and asked me which of the two implementations should be used.

***ROUND 2:***

1. He asked me in detail about my projects for about 15 minutes.

2. Then he asked me about the subjects I had studied in 3rd and 4th semesters.  
 I forgot what all subjects I had studied     
 The first subject that came out of my mouth after a lot of thinking was Unix Linux Programming. Then he asked me to write all the commands I knew in 5 minutes. I listed almost 20. He asked me the functions of a few of them and differences between some of them.

3. Finally he asked me a question on binary trees which was pretty simple.  
 Replace the data of every node of a Binary Search Tree with the sum of all the nodes greater than it.  
 I gave him the approach using reverse inorder traversal. He then asked me to write a code on paper. I had used pointers in the code. He then asked me to write a code that did not use pointers, static variables or global variables.  
 I wrote that. Finally he appeared satisfied.

**Person 2**

***ROUND 1:***  
 1. Given a singly linked list and an integer k, I had to write code to reverse the list in pairs of k handling all base cases as well.  
 eg. 1->2->3->4->5->6->7->8 k=3  
 o/p 3->2->1->6->5->4->8->7  
 She actually tried my code on a number of base cases trying to find bugs 

2. Given 2 arrays one of size n and another of size (n+k) but having k values filled, I was asked to merge the two into the second array without using any extra space. I quickly gave her the logic and we moved on to the next question.

3. Given a string of characters, find the index of the first repeating character in the string.  
 eg. abcba  
 o/p: 0 (as ‘a’ came initially before ‘b’ did, though both are repeated twice).  
 Again error free code was required.

4. She then asked me questions on the research project I was currently working on. This went on for another 10-15 minutes.

***ROUND 2:***  
 1. This round started with questions on my research project. Then he asked me which data structures I liked. We had a long discussion on heaps and the associated time complexities.

2. Given a binary tree, any node in the tree and an integer k, print all the nodes at a distance k away from the given node.  
 Mind you, the node may be above or below. We first discussed on an approach and after he was satisfied with my explanation, he asked for error-free code.

3. Given an integer n, how many BST’s can you make with n no of nodes?  
 I told him about catalan number and the direct formula – 2^n – n. But he wanted a derivation, so I built-up a recurrence and showed him the DP to evaluate it.

4. Given n people, you are told all pairs of people who belong to the same country. You are to tell the number of pairs of people who do not belong to the same country,  
 I expressed it as a graph and applied dfs to get number of connected components and size of each. Then it was a simple formula over no of components.

After this he started discussing the life at Amazon, what the company expects from you and what you should expect to do at the company.

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# Amazon Interview | Set 115 (On-Campus)

Hai, recently amazon visited our campus for recruitment. Here is my amazon experience.

1000 people attend round 1  
 **Round 1: (1.30 hrs)**  
 20 MCQ’s + 2 coding question  
 19 MCQ’s were from os,c++,java and single mcq from probability  
 Coding questions:  
 1. Find maximum sum in a array,such that no two elements are adjacent.  
 For example 3,2,7,10 should return 13, sum of 3 and 10. Handle for negative cases too.  
 2. Given a binary search tree,print the sum of all nodes that are in same axis (Modification of vertical order traversal)

I attended 12 mcq’s. There was negative marking,so i attended the questions which i was very confident and did both programs.  
 I was confident that i will clear the round 1.

**Round 2: (Group Fly Activity) ( 1 hr)**  
 Around 36 people were shortlisted for second round.  
 We were divided into many groups and each group was alloted a mentor.  
 Two questions were given and we have to discuss the approach with mentor and only after getting his approval we have to code.  
 1. Given a monotonically increasing and then decreasing array with duplicates and a key, return true if key exists in array.  
 2. Given k sorted arrays of different or equal sizes, merge them into a single sorted array.  
 Thanks to mentor, he was very cool and helpful, I did both the codes and handled corner cases too.

**Round 3: (30-45 min)**  
 18 people were shortlisted for third round and i was one among them.  
 First the interviewer asked to tell about myself.  
 Then he asked why i had low cgpa when compared with my school marks.  
 Then came the first question  
 1) Given n ropes of different length, combine them into a single rope,such that total cost is minimum. You can tie two ropes at a time,and cost of tying is sum of length of ropes.

First i gave a solution similar to insertion sort in a linked list,he was not satisfied, and then I gave a min heap approach. He asked for time complexity. I got wrong,so he asked what steps u will do and time complexity for each step. He added all the step cost and asked me to arrive at final time complexity.  
 After this, I got correct.

Then he asked about 2nd code in group fly activity.I used merge sort for it and he asked why i had used merge sort,and asked to improve the code.  
 Then i gave a min heap solution (:P we discussed after group round). He asked me to code it. I was not good at heaps. I tried my best but unable to arrive at working code  
 So finally he asked if i had any questions for him. I asked about amazon’s environment.After this i thanked and left.  
 I was sure that i will be eliminated and i was eliminated.  
 Only 10 people went to 4th round and 3 people were hired finally.  
 Here are some mistakes done by me  
 It was first f2f for me and i was very nervous and had butterflies in stomach, which ultimately decreased my performance.  
 I was not confident about the answer i gave.  
 My communication skills were very poor.  
 So try to avoid the mistakes done by me.

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<http://www.geeksforgeeks.org/amazon-interview-set-115-on-campus/>

# Amazon Interview | Set 116 (On-Campus)

**Round 1:-**  
 20 MCQ’s(Majority from OS and Java, C++, 1 aptitude)  
 2 coding questions.

1. Given an array, find the maximum sum that can be formed from the array such that no two adjacent elements are taken into consideration..  
 for ex:- 1,2,3,5 should return 7.  
 2. Print Vertical axis sum of the given binary tree.

**Round 2:-**  
 Group Coding Round  
 36 people made it to the next round. 2 questions were asked  
 1. Given an array which initially increases and then decreases, search for an element in the array.  
 2. Merge ‘k’ sorted arrays.

**Round 3:-**  
 Technical interview  
 18 people were selected for the next round and they asked me 2 questions  
 1. Given an infinitely growing sorted array which initially consists of 0’s and then 1’s upto infinity. Find the transition point where 0 changes to 1 effectively.  
 2. Given a binary search tree, make 2 separate trees such that difference between the sum of elements between them is minimum.(After some time he gave me a hint which helped me solve the problem).

**Round 4:-**  
 Technical Interview  
 1. Some basic OS related questions  
 2. Implement a data structure which would perform insertion, deletion, search and randomize operation with minimum time complexity.  
 We discussed a lot of data structures and I settled with a data structure (Hashtable with DLL). But he gave me clues and improvised my solution.  
 3. Implement a Queue using 2 stacks. Optimise your implementation

(They didn’t ask me to code in this round. They just checked how efficiently I approached it )

**Round 5:-**  
 Technical interview  
 I think this is the bar raiser round. We are aware of the game show in which a contestant will think of a famous personality and the host will try to find the personality within a finite set of questions. I was asked to design a system which would implement the same. He asked me to write a code to return the first question (like the deciding factor on which the elements will be further partioned) so that I can find the celebritry in minimum no. of questions.  
 I think they were checking your approach, ideas and patience in this round. Whatever solution I gave he never seemed to be satisfied. Be confident in your approach and don’t ever give up.

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<http://www.geeksforgeeks.org/amazon-interview-set-116-on-campus/>

# Amazon Interview | Set 117 (On-Campus for Internship)

Recently Amazon India visited our campus for 2 months internship. There were four rounds.

**2 online coding questions + 20 MCQ :**  
 MCQs had 15 questions(not exactly) on OS (to my surprise) , one aptitude(probability) and rest on c/c++

**2nd Round ( Group Interview / Written round) :**  
 21 were selected for the second round. We had 2 questions.

1. Given two strings, find whether they are anagrams of each other. (too easy).  
 Its here.. <http://www.geeksforgeeks.org/check-whether-two-strings-are-anagram-of-each-other/>

2. Given a n-ary tree, Convert it into an array and return it. Construct the same n-ary tree from that array again. (DFS is better here as reconstruction is necessary) –

Push the root to a stack. “pop the stack.store the value of the root node and the number of children it has in the array.push all the children to a stack from right to left”.. do this until the stack becomes empty.. the array will have dfs along with the number of children of each node.

For reconstruction,pass “i” by reference( i is for iterating through the array) take the value at index 0 .. make it has root. increment i. for all the children of the root, recursively call the same function. return root. (I hope this works :P)

**3rd round (Face to Face):**  
 Only 5 were selected.I was asked only one question and i didnt do well. Find the square root of a number. i answered that this can be done using Babylonian method. (<http://www.geeksforgeeks.org/square-root-of-a-perfect-square/>) or binary search method.. He asked me to implement Binary Search method. I did a mistake. then he asked me to correct it.. i corrected it. I wasn’t able to impress him much.

Remember the floating point arithmetic limitations.. this is where i failed.

**4th round (Face to Face):**  
 I was called for 4th round. ( Only i had 4th round because of my bad performance in the 3rd round). The interviewer asked a lot of questions. They were easy

1.Given an array of 0s and 1s sorted. Find the first occurrence of 1 ( Binary Search)

2.Given an infinite array of 0s and 1s.(sorted) .Find the first occurence of 1(similar to this.. <http://www.geeksforgeeks.org/find-the-point-where-a-function-becomes-negative/>)

3. Given a matrix sorted in ascending order both row and column wise. Search an element( <http://www.geeksforgeeks.org/search-in-row-wise-and-column-wise-sorted-matrix/> ). This is O(n+m). He asked me a better solution.. I tried and he helped me a lot..Though i wasn’t able to deliver.

4. Given a tree, print the max sum path from root to leaf .. (<http://www.geeksforgeeks.org/find-the-maximum-sum-path-in-a-binary-tree/>)

5.Given a tree,print spirally the column order of a tree.

ex : 1  
 / \  
 2 3  
 / \ / \  
 4 5 6 7  
o/p : 4 2 6 5 1 3 7

6. Implement a stack using array. Implement two stacks using an array. Implement 3 stacks.

7. You are given an array . You have to create a stack when the user wants to do so and delete a stack when the user says.You wont be given the number of stacks that will be created.

I thank geeksforgeeks for providing an excellent platform to learn new things. Check the interview corner for other company interviews.

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# Amazon Interview | Set 118 (On-Campus for Internship)

The selection procedure consisted of an online round followed by two Personal Interviews.

**Online Round**:

The first round had 20 MCQs and two coding questions. The MCQs were based on the concepts from OS, DSA, compilers, architecture etc.

The coding questions were:

1. Given an array of positive and negative numbers, arrange them in an alternate fashion such that every positive number is followed by negative and vice-versa maintaining the order of appearance.

2. Given a n x m matrix, print the elements diagonal wise from top to bottom.

**First round of PI** :

1. Given a number n find the number of balanced parentheses expressions of that length.

Input: 2

Output: 1 which is (),

Input: 4

Output: 2 which are (()) and ()().

I gave a complex solution involving segment tree in which he pointed out the mistakes and then asked to write a code to check if a given expression is balanced or not.

2. Tell something about LRU. What DS will you use for it? Write pseudo code for it.

(Hint : Quite simple..Use doubly LL)

**Second round of PI:**

The interviewer introduced himself first and then asked me about myself.

We had a discussion on my projects.

1. Given two binary trees, write pseudo code to determine if one is a subtree of the other. I answered it and then he modified the question to check if the other tree elements are the subset of the elements of the first tree. (Hint: Inorder traversal)

2. Given a sorted circular linked list which is rotated at some point, write pseudo code to insert a new node. Ex: 8 1 2 5 7 and insert 6.

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# Amazon Interview | Set 119 (On-Campus for Internship)

The selection procedure consisted of an online round followed by two Personal Interviews.

**Online Round:**  
 The first round had 20 mcq consisting of 3-4 questions from aptitude, 2 questions from os and rest were from Basic C and Data Structure. There were 2 coding questions as well.

Question 1: You are given a phone keypad like following diagram, where each character corresponds to a digit mentioned in the same box.  
 

You are given n strings and you have to find their decimal representation. You have to print the string and corresponding decimal representation in descending order.  
 Like if you are given “amazon” then its corresponding decimal notation will be 262966.  
 If more than one strings have same decimal notation then you have to print them in the order in which input is given.  
 (Given that given string consists of lower case alphabets only.)

Test Case 1:  
5  
Amazon  
Microsoft  
Facebook  
Aa  
Bb  
  
Output:  
642767638 microsoft  
32232665 facebook  
262966 amazon  
22 aa  
22 bb

Question 2: Given a string. Print all Possible permutations of different lengths in sorted order.

Input: abc  
Output:  
A  
Ab  
Ac  
Abc  
b  
Bc  
c

Candidate who could solve at least one question out of 2 coding questions was selected for personal Interviews.

**Round 2(P.I. 1) :-**  
 Firstly interviewer had a deep discussion of my project. He also asked me to write code for one of my mini project (Backtracking).  
 Then he asked two back to back coding questions –

1. You are given a bst. You have to print the kth smallest element.  
 (<http://www.geeksforgeeks.org/find-k-th-smallest-element-in-bst-order-statistics-in-bst/>).

2. You are given two sorted arrays and you have to print the median obtained after merging them in log(n) time complexity.  
 ([http://www.geeksforgeeks.org/median-of-two-sorted-arrays/](http://www.geeksforgeeks.org/find-k-th-smallest-element-in-bst-order-statistics-in-bst/))  
 Then he asked the language in which I am comfortable for coding. I said C . Then he asked me to allocate the dynamic memory of 2-d array in C( I used malloc function for this). Then he asked me the difference b/w malloc and new (c++) function.

**Round 2 (P.I. 2):-**  
 Firstly he asked me to tell about my academic background. Then he directly put a coding question in front of me.  
 1. You are given a binary tree and two nodes. You have to print the horizontal distance between them.

Let us say :  
 Given nodes are B and C : Answer would be 2.  
 Given nodes are A and E : Answer would be 0.  
 Given nodes are D and G : Answer would be 4.

We had an long discussion of 45 mins (approx.) on this problem.

One of my friend was asked the following questions:  
 2. Given a linked list. You have to determine whether or not it is a palindrome in order O(n) time without using auxiliary space.  
 3. You are given an array of integers . You have to find the maximum sum sequence.(It needs not be contiguous).

After all these rounds I and my friend both were selected  :). A total of 16 candidates were selected.  
 I really thank to GEEKSFORGEEKS for all the support and help in my preparation.

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<http://www.geeksforgeeks.org/amazon-interview-set-119-campus-internship/>

# Amazon Interview | Set 120 (On-Campus for Internship)

Recently Amazon visited our college and details are as follows.

**Online Round:**  
 There were two questions.  
 1. N strings are given.Convert all string to corresponding decimal value typed in an Alphanumeric Keypad (e.g. “bdg” -> 234). Then print all strings in decreasing order of their decimal value. If they have same decimal value then print lexicographically smaller first.  
 Input:

5  
Amazon  
sun  
run  
  
Output:  
262966 amazon  
786 run  
786 sun

2. Write a code to print all possible combinations(order matters) of characters of string in lexicographical order.  
 Input: “ABC”  
 Output: A, AB, ABC, AC, ACB, B, BA, BAC, BC, BCA, C, CA, CAB, CB, CBA

Interview:  
 **Round 1: 45 minutes**  
 This started with a brief discussion on project. She quickly moved on to Coding questions.  
 She made me write an error free code for “Count all pairs which sum to k in a BST”. Also she added that duplicates may be present but on left side only.  
 First she discussed for approach and then constrained the space complexity to be O(1). She checked the code rigorously.  
 Then there were 3-4 coding questions. She just discussed approach.  
 -Update all nodes in a bst to be sum of all elements greater than or equal to it.  
 – Stock problem/ Given an array ‘arr’ find maximum difference between two elements (max(arr[i]-arr[j]) where i>=j).  
 -Then there was this awesome question… Given a perfect binary tree.  
 print nodes in a specific manner. e.g-

15  
 / \  
 13 14  
 / \ / \  
 9 10 11 12  
 / \ / \ / \ / \  
 1 2 3 4 5 6 7 8  
print - 1 8 2 7 3 6 4 5 9 12 10 11 13 14 15

I told her approaches having some space complexity. Again she restricted space complexity, and I got an efficient solution by recognizing some pattern  .

**Round 2: 25 minutes**  
 There were just two questions.  
 1- Given a string having no spaces, and a dictionary.Problem was to find if that string can be splitted in multiple strings such that all the splitted  
 strings are in dictionary. I was provided a function search(string str) which will tell if a particular string str is in the dictionary or not.  
 I quickly gave a recursive approach.  
 2- The second question was well known vertical order traversal of a binary tree. She just discussed how to implement various approaches in C++.  
 Then there was discussion on types of projects assigned to Interns and blah blah.

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# Amazon Interview | Set 121 (On-Campus for SDE-1)

5-quant, 15 technical, (no verbal reasoning and English).

1) Given 2 binary trees check if it is symmetric (structure only not data).  
 2) Remove duplicates in a string in O(n) time (order of input must be preserved)

**Round-1**  
 1. Heaps-insertion.  
 2. Advantages of heaps over arrays.  
 3. Find 2nd min element from given array  
 4. Given an array and a sum s find all pairs of numbers which whoose sum=s  
 (assume array is already sorted)space complexity-O(1),time complexity-O(n)

**Round-2**  
 1. Given a tree construct a mirror tree and return root of mirror tree.  
 2. Level order traversal of a tree.  
 3. Given a stack output a sorted stack.(hint use recursion).

**Round-3**  
 1. Given a tree populate the sibiling of the tree node with the next node in same level.space complexity-O(1).  
 2. What happens when you type amazon.com in browser.

**Round-4**  
 1. Linked list problem <http://www.geeksforgeeks.org/write-a-function-to-get-the-intersection-point-of-two-linked-lists/>  
 2. A simple problem in linked list.

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<http://www.geeksforgeeks.org/amazon-interview-set-121-campus-sde-1/>

# Amazon Interview | Set 122 (On-Campus for Internship)

My interview comprised of 3 rounds. 1 Online and 2 face to face rounds.

**Online Round**  
 In this round there were 20 MCQ’s to solve and 2 coding question. Of the 20MCQ’s a couple of questions were on Quantitative aptitude, relationships, OS, DBMS, Data structures etc. there was negative marking for every wrong answer so I attempted only 15 for which I was sure.

Q1- find the first non repeating character in a string.

Q2- given a binary tree where each node has some weight. You have to return the max weight in the binary tree.

Maxweight = value of root node + value in its left subtree and right subtree.

Ex 2  
 / \   
 -1 3  
Output = 4

After this round 33 students were selected for face 2 face round. 

**Round 1 F2F (40-50 mins)**  
 Q1 – given a binary tree where the left subtree is mirror image of right subtree. So you have to check whether the tree is symmetric or not (structure wise). O(n)

Ex - 1  
 / \  
 2 3  
 \ /  
 4 5  
Output - Yes

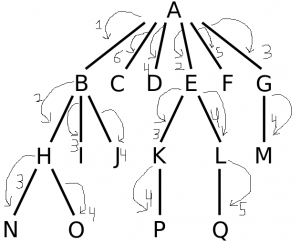
Q2 – given a sorted 2D matrix and you are given a value you have to search that value in the matrix. I gave him two solutions. O(row + col)

Q3 – given two arrays in sorted form. The first array has some empty space equal to the size of second array at its end. You have to merge both array in the **smartest possible** way in the first array. With constraint that auxiliary space O(1).

Ex – arr1[9] = {2,4,5,7,8,\_,\_,\_,\_};  
 arr2[4] = {3,6,8,9};  
 after merging arr1 should be = {2,3,4,5,6,7,8,8,9};

For every question I was asked to write a working code with all corner cases handled. I impressed the interviewer very much in this round :). Then I ask him some questions like – how an intern contribute to the amazon’s claim to be the most customer centric company and a few more.

**Round 2 F2F (70–80 mins)**  
 This interview was with a senior guy.  
 Q1 – Given a very large n-ary tree. Where the root node has some information which it wants to pass to all of its children down to the leaves with the constraint that it can only pass the information to one of its children at a time (take it as one iteration). Now in the next iteration the child node can transfer that information to only one of its children and at the same time instance the child’s parent i.e. root can pass the info to one of its remaining children. Continuing in this way we have to find the minimum no of iterations required to pass the information to all nodes in the tree.

Minimum no of iterations for tree below is 6. Consider passing root information first to any child except A-B answer will come more then 7. So 6 is the minimum answer.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/amazon.png)

I gave many approaches for this question but he was not satisfied with any approach. I said I will try to do it in a binary tree then I will generalize it for n-ary tree. He said your binary tree approach is correct but the way you are generalizing it to n-ary is wrong. The interviewer gave me many hints and said you have almost solved the question but missing a single point which I was not able to find till the end. Finally he moved to other question.

Q2- given a binary tree you have to check whether it is BST or not.  
 This question was very easy. I solved it within minutes (one inorder traversal approach O(n)) but to my surprise the interviewer was saying it is wrong. I explained to him but again he said it is wrong. His motive was to pressurize me but I stick with my solution and finally he moved to other question. My answer was correct.

Q3 – given a BST find the Nth maximum and Nth minimum element.  
 I solved it in O(n). He was fine with it but he said do it in logarithmic time. I did it too with some preprocessing and coded both the approaches.

Overall it was a very nice experience interviewing with them.

**Some tips:**

* Be confident. Don’t let the pressure prevail on you.
* Amazon is mainly looking for those who can write code, only telling approach is not fine. So start practicing as much as you can. There is no barrier of programming language.
* Please do ask questions to interviewers when they ask and try to ask something which shows that you are very much interested in working with them
* [www.geeksforgeeks.org](http://www.geeksforgeeks.org/) – my guidebook. Utilize the immense resource available on this portal for your benefit but don’t mug up the code. Try to first solve it by yourself.

Good Luck !!!

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<http://www.geeksforgeeks.org/amazon-interview-set-122-campus-internship/>

# Amazon Interview | Set 123 (On-Campus for Internship)

**Online round:** In this round there were 20 MCQ’s to solve and 2 coding question. Of the 20MCQ’s a couple of questions were on Quantitative aptitude, relationships, OS, DBMS, Data structures etc. there was negative marking for every wrong answer so I attempted only 15 for which I was sure.

Q1- find the first non repeating character in a string.

Q2- given a binary tree where each node has some weight. You have to return the max weight in the binary tree.

Maxweight = value of root node + value in its left subtree and right subtree.

Ex - 2  
 / \   
 -1 3  
Output = 4

**1st round(50 mins):**  
 Q1. Reverse link list in k chunks  
 <http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>  
 Interviewer was first interested in approach then he asked me to code.

Q2. Spiral order traversal of binary tree  
 <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>  
 I first told him 2 stack approach but he asked me to do without stack .Then I gave him a solution using one queue and one stack and he finally asked me to code both the approaches.

Q3. Longest palindromic substring  
 <http://www.geeksforgeeks.org/longest-palindromic-substring-set-2/>  
 I first used DP but he asked me to do O(1) space complexity. I was unable to do so.

**2nd round :**  
 Q1. Connect sibling pointer in a binary tree  
 <http://www.geeksforgeeks.org/connect-nodes-at-same-level/>  
 <http://www.geeksforgeeks.org/connect-nodes-at-same-level-with-o1-extra-space/>

Q2. Push ,pop and min operations in O(1)  
 <http://www.geeksforgeeks.org/design-and-implement-special-stack-data-structure/>  
 He asked me to do middle operation also and then he asked me to code 2nd problem.  
 [http://www.geeksforgeeks.org/design-a-stack-with-find-middle-operation/](http://www.geeksforgeeks.org/design-and-implement-special-stack-data-structure/)

Q3. Given n point in a 2d plane ,find k distant nodes from the origin.  
 I told him min heap approach and he was satisfied.

Q4. Problem statement was very long but it was topological sorting.  
 <http://www.geeksforgeeks.org/topological-sorting/>  
 I used adjacency list representation, he asked me why  
 And finally asked me to code it.

Overall it was a very nice experience interviewing with them.

**Some tips:**

* Never give up
* Don’t start with coding ,first explain the approach.
* Be honest
* <www.geeksforgeeks.org> – my guidebook.

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# Amazon Interview | Set 124 (On-Campus)

Hello friends, recently amazon visited our campus selecting 2 FTE and 7 interns for different roles.  
 I would like to say about rejections. I’ve got rejected in many companies (even in Amazon) but finally got placed in a good company. So be strong, there is always a door opened for us.

Here I share my experience with amazon.

**Round 1:**  
 Around 500 people attended this round. As usual 20 MCQ and 2 programming questions.  
 We need to do at least one programming question to get through this round.  
 MCQ’s include various topics like OOPS, OS, CN, DBMS etc.  
 Two coding questions were:  
 1. Merge two linked lists of different size such that nodes from each list are arranged alternatively.

2. Finding the minimum difference (I forgot the actual question).

59 people got shortlisted in this round.

**Round 2:**  
 It’s a group fly round and people are divided into groups and asked to sit in different class rooms.  
 We were given a question in a paper. Here everyone got a standard question. The question which I got was “Finding the largest contiguous sub array, start and end indexes must be printed with sum “ (kadene’salgo).  
 My friends got questions like “Boundary traversal” etc.  
 So, This round is very simple and if you are strong in standard problems, you can clear it with ease.  
 29 got shortlisted to next round.

**Round 3:**  
 It was very simple for me because we were running out of time. Only one question was asked.  
 “Find the kth element from the end in a SLL “  
 Different approaches were discussed and he asked me to code for the best one.  
 19 got shortlisted to next round.

**Round 4:**  
 It was one of toughest round for me. I was very much interested in SDE role but I was interviewed for SE/QAE role. I dint dare to ask the interviewer about the role. We are not said before the interview that they are going to interview for that roles. I mean it is in their hands to decide the role that matches your skills.  
 Questions were a bit tough for me in this round because am not much good in troubleshooting and testing. And this round went almost for 1 hr 30 mins.

Questions:  
 1. Given start and finish times of a youtube video and how do you confirm that the video is completely watched by the user or not? I gave a solution, we can set flags when the user watches a particular unit of video. He asked me how discrete? I said it may be in terms of seconds. He then asked me, If a user is just watching in terms of microseconds? I was not able to give the right answer. He was not satisfied with my solution. 

2. A web application is running. We have only a text box. If we enter a name in the text box, we get the details of the person whose name is entered. Now the question is to troubleshoot the application when it stopped displaying the results after entering a name( whose details are present in the data base).  
 I answered many points here, like server is disconnected and there may be locks on the details such that only one user can access the data at a time. And many other, but he was not much satisfied.

3. Give the test cases for the Gmail login page. At first I got tensed on hearing this question but I answered well. I almost gave 10 test cases quickly but, the interviewer want to extract as many he can. So he started noting down all the points which I said and kept asking me further points. Finally 25 – 30 test cases were covered.

4. Given a video whose audio is not playing in a video player. Troubleshoot.  
 I gave many answers here. Like, there may be two major possibilities here. 1. The video may have some problem 2. The video player software may have some problem. Then I gave many points in each category. Like OS dependent etc. He was satisfied with my answers.

5. And 2 more questions were asked (I forgot ) They were from testing and troubleshooting.

14 got shortlisted to next round.

**Round 5: (Hr + Tech )**  
 This was the round which I dint get through.   
 First, Tell me about yourself. I request everyone to be well prepared for this question in any interview. It looks so simple, but its very difficult to impress the interviewer with your answer here.  
 Next was a question from trees. Find the vertical sum in Binary tree. I said I’ve done it before and I know the solution. He asked me to go ahead. Then I answered the same thing which was given in GFG. He then asked me to do it in a single traversal. I gave another solution but it also took 2 traversals. He scolded me that it is also taking 2 traversals. I was not able to think anymore after this. But it was very simple one. ?  
 Next he asked me to find the duplicate chars in a infinite length stream of chars. I gave a hashmap solution and he asked me about hashmaps. He then extended the question that we have Integers also. Even then I said hashmap solution suits. He asked me about collisions here. He asked me how much size of hashmap you need?. And also about the range of elements that can be mapped? I answered well all these questions because I’ve read a lot about hashmaps.  
 Next he asked me a troubleshooting question. I answered this like the one which I faced in the previous round.  
 Next he asked me “what happens during withdrawal of cash from ATM “? (only during withdrawal ?)  
 I was not able to convince him with my answers. He was expecting a lot in terms of internal clocks and stuff in ATM.  
 Next He asked me “what happens when you enter an URL in a web Browser “?  
 I read this question in many interview experiences, so I answered it well But, He asked few questions in between. Like what is HTTPS? What does ‘S’ stands for in ‘HTTPS’?  
 And finally I was in a trap by this final question. What is a Web server? I really don’t know. But I dared to answer, But to my bad luck I answered DNS server instead of Web server. He was very much angry with my answer and asked am bluffing? GONE   
 All the impression was gone by just one simple mistake of mine and I dint get through.  
 Finally 9 people got offers out of 14.  
 2 were FTE and 7 were given INTERN.

**TIPS:**  
 If you are aiming for AMAZON then just try to solve as many questions as possible in GFG.  
 Try to be frank in the interview. If you don’t know the answer, Just accept that you don’t know.  
 Finally be Strong. Rejections are inevitable unless you are very cautious.  
 I hope this will help others.

ALL THE BEST.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

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<http://www.geeksforgeeks.org/amazon-interview-set-124-campus/>

# Amazon Interview | Set 125 (On-Campus for Internship)

Online Round  
 In this round there were 20 MCQs to solve and 2 coding questions. Of the 20MCQs a couple of questions were on OS, Quantitative Aptitude, Data structures etc. Most of them are there on [www.geeksquiz.com](http://www.geeksquiz.com). In MCQs there was – 0.25 marking for every wrong answer and +1 for right answer. Coding questions were of 10 marks each.

Q1- Given an array of positive and negative numbers, arrange them in an alternate fashion such that every positive number is followed by negative and vice versa maintaining the order of appearance.If the count of negative numbers is more keep the extra at last in array

constraint : Space complexity should be O(1).

Q2- Given an array of random numbers, Push all the zero’s of a given array to the right end of the array in minimum possible swaps. Order of appearance doesn’t matter. Print the total nonzero numbers and minimum swaps needed to do so.

input : {1, 9, 8, 0, 0, -2, 0, 1, 6}.  
 output :  
 nonzero : 6  
 swaps : 2 (-2 as it is and swap 1 and 6 from first two zeros. )

18 were selected out of 55 for f2f round.

**Round 1 F2F :**  
 Q1- Two linked lists merge at one point, return the converging node. Constraint- O(1) space and O(m+n) ,where m and n are lengths of lists.

Link: <http://www.geeksforgeeks.org/write-a-function-to-get-the-intersection-point-of-two-linked-lists/>

Q2- Rotate the alternate levels of a binary tree.

Input:  
 1   
 / \   
 2 3   
 / \ / \  
 4 5 6 7   
 / / \ / \   
 8 11 10 12 13   
Output:  
  
 1   
 / \   
 3 2   
 / \ / \  
 6 7 4 5   
 / \ \ / \   
 13 12 8 11 10

First he asked to do it without recursion and then with recursion. O(n) time complexity.

Q3 – Write an efficient function that takes two strings as arguments and removes the second string from first string (in place). (Shifting not allowed)

input:  
 str1: aabcabcb  
 str2: abc

output: ab

Q4 – Insert an element into a sorted link list which is having loop somewhere and duplicate elements as well.

Q5 – Make your own data structure. which inserts, deletes and gives a random number in O(1) time.  
 Hint : Use hash table and array.

**Round 2 F2F :**  
 Q1 – You have n pencils, each having l length. Each can write 4 kilometers. After writing 4 kilometers it has l/4 length. Then you can join 4 pencils which are having l/4 length and can make 1 pencil. You can’t make pencil of pieces if remaining pieces are 3 or 2 or 1 in number. And you can include these remaining pieces whenever you need. Write a recursive relation independent of l,length of given pencil, for how much one can write from n pencils. Write mathematical equation also.

Q2 – Find the largest sum subtree in a given Binary Tree.

Q3 – Reverse level order traversal.  
 time complexity : O(n)

Input:  
 1   
 / \   
 2 3   
 / \ / \  
 4 5 6 7   
 / / \ / \   
 8 11 10 12 13   
output:  
13 12 11 10 8 7 6 5 4 3 2 1

You are permitted to use extra space and now print them in separate levels too.

Output:  
 13 12 11 10 8  
 7 6 5 4  
 3 2  
 1

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<http://www.geeksforgeeks.org/amazon-interview-set-125-on-campus-for-internship/>

# Amazon Interview experience | Set 127 (For Internship)

Amazon visited our campus for summer internship. I prepared from Amazon Interview Sets which were pretty helpful!

Here is my experience :

DAY 1

They had an online aptitude test on day 1. It was 90 minutes: 20 MCQs + 2 coding questions (choice between C/C++/Java for coding). MCQs were based on DSA, OS, and Math. They were apparently difficult.

**Two Coding Questions :**

1. [Keypad problem](http://www.geeksforgeeks.org/find-possible-words-phone-digits/) – Little difficult problem on backtracking.

2. [Given an array, find the count of impossible triangle](http://www.geeksforgeeks.org/find-number-of-triangles-possible/)

Day 2:

**Surprise aptitude test**:

2 coding questions 60 mins.

Questions involved DSA and strongly based on optimising the code:

1. Given a linked list, reverse K nodes in it

eg :- 1->2->3->4->5->NULL , k = 3

3->2->1->5->4

2. Search for an element in an array which has elements who’s values are first increasing and then decreasing. (Use modified binary search)

**2 One-on-one Interview rounds, both technical.**

Try giving THE most optimal algorithm which satisfies edge cases too.

I was told to write the code on the paper.

Questions asked to me were:

**First interview round**

1. [Find the second largest element in an array.](http://www.geeksforgeeks.org/to-find-smallest-and-second-smallest-element-in-an-array/)

2. Given a sorted array which can have repeated elements, find the occurrence of an element. (Most optimal solution is O(logn) – Using binary search to find start and end occurrence)

3. Make a data structure and implement an algorithm to print all the files in a directory. (the root directory can have sub-directories too.)

I used an n-ary tree and BFS to print files. It can also be done using Stack.

**Second interview round**

1. He asked some question about my CV

2. [Print a matrix diagonally.](http://www.geeksforgeeks.org/print-matrix-diagonally/)

3. DFS of binary tree, n-ary tree.

4. Then he asked some question from other subjects.

OS – Scheduling   
 DBMS – Normalization, Transaction  
 OOPS – Abstraction

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-126-internship/>

# Amazon Interview experience | Set 126 (For SDE-1)

Recently I got interviewed with Amazon for SDE1 position and here is my interview experience which I would like to share with others.

**Telephonic round:**  
 1. An array is given with element name and their respective pH values. Print the combination of 2 elements which make a neutral compound.  
 A discussion started and best solution was O(n) time complexity and O(1) space complexity.  
 Then I got call for F2F interviews and here are those-

**Round 1:**  
 1. Print Matrix in spiral form.  
 2. A store have n customers and any 1 can visit them any time through out the year.Data is stored in a file.Design a data structure to find given person visited on so n so date or not.

**Round 2:**  
 1.There are N packages P1, P2…Pn. A package may depend on another or many other for its compilation. Given a matrix of dependency, find a sequence of package compilation.  
 2.A 2D matrix is given, with each elements representing number of gold coin at that position. I have to travel from (0,0) to last element of matrix collecting maximum no. of coins.I can travel either right of an element or down of it.  
 3.In Galaxy there are trillions of stars. I am provide distance of every star from earth. Tell me nearest 1Million stars to earth, provided with best time and space complexity.

**Round 3:**  
 1. Implement LRU.  
 2.In Android phones we have 3X3 grid for making a pattern. Given a length, find number of combinations for that length in that grid.

**Round 4:**  
 1. Project deep discussion.  
 2. Few given scenarios and how you will tackle.  
 3. Strengths and weaknesses.  
 4. Given a file with many statements. Print all the strings with their anagrams through the file.Logic to check anagrams and to store them.

**Round 5(Bar Raiser):**  
 1. Behavioral Questions like  
 >Why you want to leave your organization?  
 >What is most challenging work you have done till date?  
 >Why you want to join Amazon?  
 etc.  
 2. Which data structure you know?  
 3.Say I have few words and their meaning, and I want to store them which DS will you use and why.  
 I started with Hashmap and we kept on discussing about pros and cons.Finally ended up with trie.He asked me to write code for it, for adding new word and for fetching meaning from Trie.

The whole process started in 1st week and yesterday got a call from HR for I am invited to be part of Amazon.

Thank you geeksforgeeks for providing such a nice platform to learn and share.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-126-sde-1/>

# Amazon Interview experience | Set 128 (For SDET)

I was interviewed for the position of SDET-1 few days back at Chennai. Here is my interview experience:

**Coding round (Full code required):**  
 1) Given a linked list. Check whether it is a palindrome (without using any extra space).  
 2) Write a program to return the mirror tree of a given binary tree.  
 3) Given a 2-D array, Rotate it by 90 degrees.

**F2F-I:**  
 1) Given a phone number. Check whether it is unique or not(ie no duplicates)  
 I gave a o(n^2) TC algo first which he wanted to optimize. After 3 series of optimization ,I came up with a o(n) solution with o(1) space complexity.

2) The interviewer told me to code a level order traversal in a binary tree.

3) An array of numbers are given such that the absolute difference between adjacent elements is 1.Given a value…Return the index of the 1st occurrence of that element.  
 I gave an solution where in the 1st value is subtracted from the search value and hops in the array by that difference. if the reached value is the search value ,then return the index or just continue this process. The interviewer was impressed by my solution and told me to code it.

**F2F-2:**  
 1) Brief discussion of work in current company

2) A given array represents a tree in such a way that the array value gives the parent node of that particular index.The value of the root node index would always be -1.Find the height of the tree.

Ex: Array: 1 5 5 2 2 -1 3  
 5   
 / \  
 1 2  
 / / \  
 0 3 4  
 /  
 6

I gave a iterative solution which was told to be optimized. I did optimize it using memorization concept. I had to code it too.

3) Write a program to find the median of 2 sorted arrays when merged.

This problem is there in geeksforgeeks.

4)Write an optimised program to find the number of factors for a particular number  
 This was a very simple qn.

**F2F-3:**  
 1) Brief discussion of work in current company. Why Amazon?

2) Why do you want to leave current company? What do you like most and dislike most about your current company?

3) Design a automation framework to test a simple site with a login page .Give the various test cases also that should be considered. Later they told me to give some enhancements to the code too.

4) Design a automation framework to test twitter api’s that is used in a particular site .

5)Give the various automation scripts and tools that I implemented in my current project.

**F2F-4(Hiring Manager):**  
 1) Lots of HR, behavioral and team fit questions

2) Describe the most challenging project I have worked on…and why is it challenging.

3) An e-commerce site has a particular functionality created by a group A and another functionality created by group B. Design a testing framework that could test the work by A as well as A/\B(intersection).

4) I was working as a security Analyst.So I was asked about 5 critical hacking techniques that can be used to a e-commerce site and describe each.

**F2F-5(Bar raiser):**

1)Again behavioral and team fit questions.

2)Write a program to check the validity of sorting algorithms used to sort Linked lists.Consider the case where 2 nodes have equal values too.  
 I gave a optimized code using hash table concept. The interviewer was pretty satisfied with my coding ability and started asking me about my projects.

3)More questions on my projects

Thank you geeksforgeeks for helping me out during my preparation.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-128-sdet/>

# Amazon interview Experience | Set 129 (For SDE 1 Off-Campus)

In the recent past, I attended interview with Amazon. Here is my interview experience.

**Written Round: 1.5 hours**  
 1. Given an array of integers, replace each element with the next immediate greater element.  
 2. Given a linked list, reverse each 3 nodes.  
 3. Given a tree, print all the nodes which are K distance from the leaf nodes.

**Face to Face Interview 1 (Data structures and Algorithms)**  
 1. Given a source string and destination string, Find the minimum number of edits (operations) required to convert one string into another. At the end of each operation, the resultant string should be a dictionary word.

2. Given an array of integers where each element represents the max number of steps that can be made forward from that element. Write a function to return the minimum number of jumps to reach the end of the array (starting from the first element).  
 3. Given the coordinates of billion stars in the sky, find the closest 100 stars from our current position (0,0).

**Face to Face Interview 2 (Problem solving)**  
 1. Given a binary tree, write code to check if it is a binary search tree.  
 2. Given a binary tree and two nodes, write code to find the common parent for the 2 nodes.  
 Given the below tree, and nodes 18 and 21.

10  
 5 15  
 2 3 12 18   
 16 21

The result should be 15.

**Face to Face Interview 3 (CS Fundamentals)**  
 Tell me about yourself.  
 Why career change ? Why Amazon?  
 1. What happens when you compose an email and press the send button. How is the mail  
 delivered?  
 2. Explain how mail server works.  
 3. Tell about the routing algorithms you know.  
 4. How is the data transferred across the network ?  
 5. Difference between TCP/IP and UDP.  
 6. What are the functionalities of an Operating System?  
 7. How does OS schedule processes ?  
 8. Which type of scheduling algorithm is used widely ?  
 9. How does OS replace processes in memory ?  
 10. How does OS detects if a deadlock has happened ?  
 11. When you type an SQL query in interpreter, what does happen? How is the query processed?  
 12. What is Primary Key, Foreign Key ?  
 13. Should Foreign key needs to be primary key of another table ?  
 14. What is index ? How it is implemented ?  
 15. How is the data stored in the database ?  
 16. Why doesn’t Java support Multiple Inheritance ?  
 17. What are the advantages and disadvantages of Multiple inheritance ?  
 18. Tell us about the design patterns you know.  
 19. Do you know about Factory Design pattern ?  
 20. Write a simple class which implements Singleton design pattern. Applications of  
 singleton design pattern. Why don’t we declare the class itself as static class ? Why  
 don’t we declare all the members as static ?

**Face to Face Interview 4 (Hiring Manager)**  
 Tell me about yourself.  
 Why career change ? Why Amazon ?  
 1. Discussion about my current project, I am working on. Questions related to schema design, how can we improve it ? How to make the application scalable if the operations and data (session creation & data) are going to be increased 100 times. When do we need big data ?  
 2. What is your biggest achievement ?  
 3. What do you expect from your manager and team members ?  
 4. Given billion numbers in a file, get the top 10 numbers from it.  
 5. Write code to implement Hashmap in Java. It should accept any datatype and also objects.  
 6. Provide a high level class design for cab management system. Finding available car anytime and booking it, customers, orders, etc.

F**ace to Face Interview 5 (Bar raiser)**  
 Tell me about yourself.  
 Why career change ? Why Amazon ?  
 1. What is your biggest achievement ?  
 2. Discussion about my project. Discussion about the tasks which I have done.  
 3. Tell me about a situation where you had a conflict with your manager and how you resolved it ?  
 4. What is the biggest bug have you made ?  
 5. Have you developed any tool, which is used by your colleagues ?  
 6. Is there any task which you feel, that you could have done better in your project ?  
 7. Have you suggested any ideas and improvements to your project, beyond your call of duty ?  
 8. Given a binary tree, write code to get the vertical sum of all the columns in the tree, with minimum space complexity. After I told a solution with Hash, he asked me to come up with a solution without using hash and code it.

**Face to Face Interview 6 (Data structures)**  
 1. Given a binary tree, how would you serialize it, store in a file and then recreates it again from the file ?  
 2. Given a dataset below,

Name Score Rank  
 A 50 1  
 B 40 2  
 C 30 3  
 D 20 4  
 E 10 5.

Name is a string and Rank is inversely proportional to the scores.  
 What type of data structures would you use to store these data to perform the following operations ?  
 1) Given Rank, Get the Name and Score  
 2) Given Name, Get the Score and Rank  
 3) Given Name, Update Score.

Though I didn’t get the offer, it was an amazing interview experience with Amazon. Thanks to GeeksforGeeks, an ultimate portal for learning DS & problem solving and for cracking the coding interviews.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-130-sde-1-campus/>

# Amazon interview Experience | Set 130 (For SDET 1)

I attended an interview with Amazon for SDET-I position, about a month back. I did not clear the interview, but I would like thank GeeksforGeeks for the great learning period before the interview. GeeksforGeeks helped a real lot in my interview preparation and in general, my understanding of data structures and algorithms got deeper and stronger. Thank you very much GeeksforGeeks and all your valuable contributors!

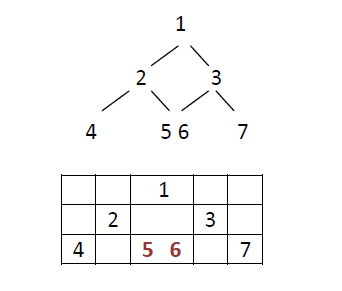
Here is my interview experience:

**Telephonic 1:**  
 1. Given an array and a number, check whether there are any 3 elements in the array which add up to the given number.  
   For example:  
      Given an array {1,2,3,4,5} and the number 9, return true, as 2,3,4 add up to 9.  
      Given an array {1,2,3,4,5} and the number 3, return false, as there are no 3 elements which add up to 3, in the array.  
 2. Given a number, find the nearest perfect square(modified binary search)  
   For example:  
      Given 50, return 49  
      Given 25, return 25

**Telephonic 2:**  
 1. Write a method to check whether two binary trees are mirrors of each other  
 <http://www.geeksforgeeks.org/foldable-binary-trees/>

2. Write a method to print the boundaries of a binary tree  
 <http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>

**F2F 1:**  
 1. Fill an array with the next greater elements (using stack)  
 <http://www.geeksforgeeks.org/next-greater-element/>

2. Given a binary tree, count the number of occurrences where there are two nodes with the same horizontal distance. To make it clearer, if we assume each node in a cell of a matrix, then count the number of occurrences when there is a collision of two nodes in the same cell.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/amazonInterview.png)

Here the count is 1 because 5 and 6 occupy the same cell in the matrix

**F2F 2:**  
 1. Given a linked list, write a program to check if it is a palindrome  
 2. Write some test methods for stress testing of Furniture class  
 3. Some discussion on automation testing

**F2F 3: (System automation design)**  
 System: The user gives a book id to be downloaded and the location in which the book is to be stored. The system downloads the book (if it exists) in the location given by the user and returns a url through which the user can access the book.  
 I was asked to design automated test cases for the system. The interviewer kept adding more and more constraints to the system and we discussed about the pros and cons of my approach.

**Hiring Manager:**  
 1. Discussion about my current job role  
 2. Several behavioral and team fit questions  
 3. What are the things you will consider (both from Developer’s perspective and User perspective) while trying to develop an application for computer aided competitive examinations like CAT, GMAT etc.

**Bar Raiser:**  
 1. Given a singly linked list, write a recursive method to reverse every 3 nodes in the list.  
 I did not write a clean code for this. He moved on because of lack of time.  
 2. Again discussion of my current job role and about the projects I have worked on.  
 3. Tell me 3 things that you want to learn/change in yourself  
 4. Again several team fit questions.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-130-sdet-1/>

# Amazon interview Experience | Set 131 (For SDET 1)

Amazon visited my college and offered me SDET-I position. GeeksforGeeks helped a real lot in my interview preparation. Thank you very much GeeksforGeeks!

Here is my interview experience:

**Round 1 (On-line Coding Round on HackerRank):**  
 1. Given an array of sorted integers which represent box sizes and an integer representing an item size  
     You have to find best fit box for the item (-1 in case of no box found)  
   For example:  
     Given 10,20,30,40,50,60,70 and 45  
       You have to print 50  
     Given 10,20,30,40,50,60,70 and 75  
       You have to print -1  
       Given 10,20,30,40,50,60,70 and 50  
     You have to print 50  
 2. <http://www.geeksforgeeks.org/forums/topic/find-a-string-inside-a-2-dimensional-array/>

**F2F 1:**  
 1. Given an array of integers  
 you have to output sequence a1,a2,a3,a4,a5,a6,a7 such that a1a3a5a7  
     For example:  
     Given 10,20,30,40,50,60,70  
       You have to print 10, 30, 20, 50, 40, 70, 60  
 At first, I gave answer using sorting. But my interviewer asked me to do this without sorting the input array, and I did it.  
 2. A simple question on Tree data structure which i don’t remember.  
 3. Questions related to my project.

**F2F 2:**  
 1. A matrix is given which is sorted row wise and column wise  
 You have to print the sorted order.  
     For example:  
     Given  
        1 2 3 4 6 8  
        2 3 3 4 7 8  
        2 3 4 5 7 8  
        2 3 4 5 8 8  
        3 4 4 6 8 9  
        4 5 5 7 8 9  
     You have to print sorted order  
 2. Questions related to my project during my internship.

**F2F 3:**  
 1.What happens when we type amazon.com  
 Relating to this the interviewer asked me every step in detail including all 7 layers of networks.  
 Protocols like: HTTP, HTTPS, DHCP, DNS, IMAP, POP, TCP, UDP etc. Their uses and differences.  
 2. Describe ACID property of a transaction (DBMS).

**Bar Raiser(Telephonic):**  
 1. Given a singly linked list, write a recursive method to reverse every 3 nodes in the list.  
 He asked me to inform if I have seen the question.  
 And I replied : Yes sir, it is the similar question I faced in coding round of Amazon-internship last year.  
 But he didn’t changed the question.  
 I solved it with a silly mistake which i corrected when mentioned.  
 2. Long discussion on my internship and about the projects I have worked on.  
 3. Tell about your criticism.  
 4. 3 weaknesses currently i am working.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-131-sdet-1/>

# Amazon interview Experience | Set 132 (For SDE Intern)

**Online Round :(Duration – 90 minutes)**

20 MCQs to solve and 2 coding questions. 20MCQs were on **Algorithms,Data Structures, C Output**, Quantitative Aptitude, etc.  
 Coding questions were of 10 marks each.  
 MCQ’s had negative marking.  
 Correct : +1  
 Wrong : -0.25

**Q1**- Given an array of numbers, arrange them in an **alternate fashion** such that every number is followed by a number of opposite sign. Also the **order was to be maintained.** If the count of negative numbers is more keep the extra at last in array and same for positive numbers.

Example :  
Input: -3 -2 6 0 7 -1 -8  
Output: -3 6 -2 0 -1 7 -8

**Q2**- String of characters as arranged in a cellphone i.e.  
 1- NULL  
 2-a,b,c  
 3-d,e,f  
 4-g,h,i  
 .  
 .  
 .  
 9-w,x,y,z  
 0-NULL

Print all **combinations for given number of digits**(k) in **lexicographical order** .  
 Constraint : 1<=k<4  
 For Example : Input = 234  
 Output : adg adh adi aeg aeh aei afg afh afi bdg bdh bdi beg beh bei bfg bfh bfi cdg cdh cdi ceg che dei cfg cfh cfi

**Round 1 F2F :(Duration – 1 hr)**

Introduce Yourself.

**Q1**- Design a **shuffle function** which would play songs randomly in your device (unique song\_id) and code it.  
 After i gave him a solution with hash function , he asked me to improve the algorithm such that once a song is played it should be played only when all the other songs are played,  
 Solution’s Complexity : Space – O(n) , Time – O(1) ; n—> number of songs  
 After that he asked me to improve my solution and do it without using extra space.  
 Solution’s Complexity : Space – O(1) , Time – O(n) ; n—>number of songs  
 Hint : Maintain indices and once a song is played shift it in range of played songs index.  
 After that i was asked about each part of the hash function and how i came up with that.

**Q2**- **Add two linked lists**. And code it.

Input : 1->2->3->4->NULL  
 8->2->NULL  
Output : 1->3->1->6->NULL

First he asked to do it **without recursion** and then **with recursion**.We also talked about the **problem** we face if we store the value of the linked list in an integer or long if the number of digits were above certain limits in the non-recursive function.

**Round 2 F2F :(Duration – 1 hr)**

Introduce Yourself.

**Q1** – Find the **largest subtree which is binary search tree in a given Binary Tree**. Then to optimise it and then asked me to code it.

**Q2** – Given a linked list with a next pointer and an arbitrary pointer pointing to any node in the list , **copy the linked list**.

After i gave him a solution which changed the links of the initial linked list, he asked me to do without changing the links.

So i gave him a O(n^2) solution . He asked me to give another way or optimise my solution.He helped me to figure out the solution.

Hint – Hash map.

The interviewers were really helping and supporting and were more interested in seeing the efforts you make and the way you get to the logic.They help throughout by giving hints.

Thank You geeksforgeeks for helping me out.

Best of luck .

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-experience-set-132-for-sde-intern/>

# Amazon interview Experience | Set 133

Recently had a interview with Amazon, through employee referral. All face to face rounds. I didn’t clear, so no offer. 

**1st Technical Round:**

Given an integer, find the next biggest integer whose digits are in increasing order.

Example:  
 Input: 118  
 Output: 123

Input: 127  
 Output: 234

Input: 987  
 Output: 1234

Designing question: Design a parking space to park a car.

**2nd Manager Round:**

Explain my current project. Architecture and design flows etc. asked.  
 Any challenges while working on the project.  
 Any glitches/cases where you completed got it wrong etc.

After two rounds asked to leave. I guess I didn’t answer as per standards.

Thanks anyways GeeksForGeeks.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-133/>

# Amazon interview Experience | Set 134 (Off-Campus for SDE)

I would like to start off by thanking the entire community of GeeksforGeeks for helping me out.

**Attempt 1**

**Round1:**  
 1. Given a number N, find the number of correct combination of parentheses possible.

Input: N=2 => ()()  
 Output: 2 [(()),()()]  
  
 Input: N=3 => ()()()  
 Output: 5 [()()(),((())),(())(),(()()),()(())]

2. Print all root to leaf paths using iterative algorithm in linear time.

**Round 2:**  
 1. Given ‘m’ and ‘n’ (m < n), print all nodes between levels ‘m’ and ‘n’ in level order.  
 2. Print a matrix in spiral order.

**Round 3:**  
 1. Check if two trees are mirror images of each other.  
 2. Given inorder and preorder traversals, build a binary search tree.  
 3. Print all the boundary nodes of a given binary tree.  
 I was rejected after this round. I applied again after few months.

**Attempt 2**

**Written Round(on HackerRank):** It contained 3 simple questions on data structures. Duration 60 mins.

**F2F – Round 1:**  
 1. Given a singly linked list and a value ‘k’ such that k Input: A -> B -> C -> D -> E , k=2  
 Output: E -> C -> D -> A -> B

Input: A -> B -> C -> D -> E -> F , k=2  
 Output: E -> F -> C -> D -> A -> B

2. What is Paging? What do you mean by page faults? How will you handle page faults?

**F2F – Round 2:**  
 1. Given a BST and given that 2 nodes are swapped in the tree. Identify the 2 swapped nodes.  
 2. Given a BST and 2 nodes. Identify the length between the two nodes of the tree.

**F2F – Round 3:**  
 1. Detailed discussion of current projects.  
 2. How would you design the meeting invite feature of Microsoft Outlook? Considering each meeting invite as an object and that Web server is the storage space for the invites, design a data structure to receive and send invites to user in an efficient manner. The message objects must be received in a sorted manner based on the time of meeting. I gave an O(NlogN) solution and he was pretty impressed. I was then asked to code it.  
 3. An array is given whose every ith index is the child node of a[i] as shown in the example below. The root node is represented by -1. Find the height of the tree.I did it in linear time.

Input: parent[] = {1 2 -1 2}  
Output: 4  
The given array represents following Binary Tree   
 2  
 / \  
 1 3  
 /   
 0

**F2F – Round 4:**  
 1. Cultural info and projects discussion. What errors have you performed in your career path? What are the major challenges that you faced?…and other such questions.  
 2. Design a parking lot system. She was very much concerned with all the edge cases.  
 3. How would detect whether a singly linked list is a palindrome or not?I gave a solution with O(n) time and space complexity. But she asked to optimize it further with O(1) space complexity.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-134-campus-sde/>

# Amazon interview Experience | Set 135 (On-Campus for SDE)

Recently, Amazon visited our campus and I was interviewed for SDE position. Here is my Interview Experience:

**Online Round: (Duration – 90 minutes)**  
 20 MCQs and 2 coding questions. MCQs were on Algorithms, Time Complexity, Quantitative Aptitude, Probability, Operating Systems, Graphs, Data Structures, Recursion outputs etc.  
 Coding Questions:  
 1. In one of Amazon fulfillment centers, there are a no. of empty boxes kept in increasing order in a row. Kiva robots are designed to put a product in a box. The product size is given. Design a program to find the best fit box for given product size. First line contains no. of empty boxes and next line contains size of boxes with space. The next line contains size of given product. The output shows the best fit box size and -1 otherwise.

For example, Input: 6  
 2 7 9 11 13 16  
 12  
 Output: 13

2. You have to find a string in two-dimensional array. The input contains 2-D array of characters and given string. You can move in one of eight directions . The output contains location of first letter of string if string found completely, otherwise return -1. Any one out of multiple answers is accepted, if possible.  
 For example, Input:  
 b t g  
 p a d  
 r k j

String: rat  
 Output: (2,0)

**F2F Round 1:**  
 Brief introduction about myself and my project.  
 1. Given an array of positive and negative integers, rearrange positive and negative numbers in 0(n) time .  
 First, I solved it using 2 arrays,each for positive and negative integers and place elements of array in these 2 arrays and them combine them back by taking one element from each array. Then he told me to do without extra space. I then segregated positive and negative elements using quicksort .Below is the link:  
 <http://www.geeksforgeeks.org/rearrange-positive-and-negative-numbers-publish/>

2. Program to check whether strings are rotation of each other or not. I approached as below:  
 <http://www.geeksforgeeks.org/a-program-to-check-if-strings-are-rotations-of-each-other-or-not/>  
 He then told to solve without using strstr. I used naive searching method.

**F2F Round 2 :**  
 Brief introduction and some behavioral questions.  
 Given a BST and a key sum, design an algorithm to find all pairs of integers whose sum equal to key.  
 I first approached using an array and placing elements into it in inorder fashion and then find pairs. He told to do in-place and I solved with 2 traversals (inorder and reverse- inorder ) .

**F2F Round 3 :**  
 Based on CS Fundamentals and also had 15 minutes discussion on my internship project.  
 1. What happens when we type amazon.com ?  
 2. Describe transaction process in detail if we want to transfer from one account to other. Also design schema for it.  
 3. What happens on server side on receiving HTTP requests and how operating system interacts and then discussion related with threading, thread pool ,synchronization, hashing etc.  
 4. Describe ACID properties in detail .

**Bar Raiser Round :**  
 1. Given a Binary tree, full\_path\_sum is sum of all nodes from root to leaf in a path. Given a min\_sum value, delete nodes if path has full\_path\_sum less than min\_sum . Delete all such nodes . For example,

Given min\_sum =8   
 1  
 2 3  
 4 5 6 7  
So we delete 4.

2. How to find kth- smallest element in BST?  
 <http://www.geeksforgeeks.org/find-k-th-smallest-element-in-bst-order-statistics-in-bst/>

Thank you geeksforgeeks for helping me a lot during my preparation.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-135-campus-sde/>

# Amazon interview Experience | Set 136 (For SDE-T)

**Phonic Interview**  
 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 1. Let’s start with you introduction  
 In between introduction he asked me about my some project work experience and How have you done?

2. Take a integer as a input and replace all the ‘0’ with ‘5’.

For example:  
 102 - 152  
 1020 - 1525  
 (Do not use any array for replacing the '0' to '5')

3. You are given two binary tree and write algorithm to check  
 Are two Binary Trees mirror image of each other?

Amazon Interview for SDET @ Hydrabad Development Center  
 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**1st Round**  
 \*\*\*\*\*\*\*\*\*\*\*\*  
 1. Project Detail & past experience

2. Current Technology i am working in

3. <http://www.geeksforgeeks.org/intersection-of-two-sorted-linked-lists/>

4. Maximum Subsequent distinct & contiguous sub array in a character array

**2nd Round**  
 \*\*\*\*\*\*\*\*\*\*\*\*\*\*  
 This round was purely for checking Test Framework and Test Case Knowledge.

He has given me some scenario and ask to write test cases for them

1. you are given a web page into that simply one browse button and Image Holder is their.Write the Test Cases for this.

2. You are given application like Google Analytics. How will you test this application ?

3. what are the basic features you will add into your own test framework.

**3rd Round**  
 \*\*\*\*\*\*\*\*\*\*\*\*\*  
 This round was purely a discussion based on past project experience.Like which project do you think that was most difficult and you had a nice experience.  
 He asked me each progress point of the project.

1. how will you check that each page of amazon.com is having its logo or not.he also asked me to write code for this also.

2. Some Test Framework Based question like

3. Have you worked on any automation framework or not?

4. what happen between, when you enter a URL into a browser address bar and hit enter to actually page gets loaded ?

In between he asked me few things about DNS Server,Router etc and some discussion was there.

**4th Round**  
 \*\*\*\*\*\*\*\*\*\*\*\*\*  
 1. <http://www.geeksforgeeks.org/level-order-tree-traversal/>

2. [http://www.geeksforgeeks.org/reverse-level-order-traversal/](http://www.geeksforgeeks.org/reverse-level-order-traversal)

3. Make a stack using 2 given queue.

4. Some Project Experience & Automation Framework Discussion,which i have worked on.

5. There was some situational questions also for Team work.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-136-sde-t/>

# Amazon interview Experience | Set 137 (Assessment test for SDE)

**Coding questions:**  
 1) Given two words, find if second word is the round rotation of first word.  
 For example: abc, cab  
 return 1  
 since cab is round rotation of abc

Example2: ab, aa  
 return -1  
 since aa is not round rotation for aa

2) Given two hexadecimal numbers find if they can be consecutive in gray code  
 For example: 10001000, 10001001  
 return 1  
 since they are successive in gray code

Example2: 10001000, 10011001  
 return -1  
 since they are not successive in gray code.

**Aptitude questions:**

1) Some based on finding relationships between given number/strings and find the missing one  
 Example: VTS: RPO :: AYX: \_\_\_\_

2) Paragraph reading and inferring information from it.

3) Facts provided and making a decision based on it.

4) Combinations possible based on facts provided.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-137-assessment-test-sde/>

# Amazon interview Experience | Set 138 (For SDE 1)

**Screening round:**  
 Three coding question on hackerEarth to be comiled against the testcases  
 1. Merge two sorted linked list into single one   
 2. <http://www.geeksforgeeks.org/difference-between-sums-of-odd-and-even-levels/>  
 3. <http://www.geeksforgeeks.org/find-first-non-repeating-character-stream-characters/>

**Round -1**  
 1. Asked me again the logic for finding first non repeating char from a stream of character.  
 Then the discussion went how hash map internally works and what is the principle behind it .  
 How the hash conflict get resolved and write code for the same.

2. Find three triplet with a given sum in an array.  
 3. Find an element in an row and column wise sorted matrix.

**Round-2**  
 1. Find the majority element in an array.  
 2. Print out all the numbers in sorted order from row and column wise sorted matrix  
 3. How to find a given key in a sorted stream of array(less than 0(n) complexity required)  
 4. One more ques dont remember  
   
 **Round-3 (HM round)**  
 Lots of situational question being asked.(conflict with ur manager, ur say , leadership quality in you, ownership of project , problem solving capabiltiy)  
 Lots of question on your owned projects.(Impact of this on your product and time to implement it)

two tech ques:  
 1.<http://www.geeksforgeeks.org/stock-buy-sell/>  
 2. write code to find whether the tree is BST or not.  
   
 **Round-4**  
 1. In an array find three number which fits into pythagoras theorem(a^2+b^2=c^2).Find a,b,c  
 2. Find the number of island in a matrix of 0,1. The island which starts from edge of the matrix will not be considered island  
 eg: no of island are 0 here  
 0100  
 0100  
 0000  
 0000

**Round-5**  
 Lots of in depth question about your project and its impact on the product.  
 Was asked to draw the architect diagram of the algorithm used in my project and explain with example.  
 one tech ques : For a given string and given dictionary. Find all the anagrams of the string which are also present in the dictionary.ie the string shud be a valid dictionary word.

NOTE : I WAS REQUIRED TO CODE EACH AND EVERY QUESTION WITH PROPER SYNTAX AND EDGE TEST CASES on piece of paper after discussing the algorithm.

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### Source

<http://www.geeksforgeeks.org/amazon-interview-experience-set-138-sde-1/>

# Amazon interview Experience | Set 139

3 months Experience Candidate.

**1. Written test** 90 mins which consisted of 2 coding questions and 18-20 MCQ from varied computer science concepts.

**2. Telephonic Round**  
 1. Find the number of occurrences of a number in sorted array.  
 2. LCA in a Binary Tree.  
 3. Clone a Tree, where each node had 3 pointers left, right and random. Random pointer points to any other node in the tree.

**Interview Experience F2F (Onsite):**

**Round A with HM :**  
 1. Check for a complete cycle in a graph. ( A complete cycle is one that covers all nodes )  
 2. Construct a tree using Preorder and Inorder Traversal.  
 3. Evaluate a random function.

Since this round was with a hiring manager he asked a few questions like why do you want to leave your organization? Why so early? Plans for further studies and basic discussion of projects.

**Round B Tech1:**  
 Half an hour discussion on my projects. Then a question on strings. Write a program to output the minimum size window which contains all the given characters with at-least the given frequency. This was followed by Test Case design.

**Round C Tech2 :**  
 1. Given a Node in a tree and a value k , print all nodes at K distances from the given node.  
 2. Given a string and k, arrange the string so that all the same characters are K distance apart. If not possible print -1.

**Round D BR :**  
 1. Given two arrays sort the first array in the order of numbers given in the second array. For the numbers that do not appear in the second array, sort according to face value. Discussed methods and codes. He always pushed to optimize the code.

This was followed by discussion on sorting techniques, there comparisons. In the end he asked a few questions from OS mainly the scheduling algorithms.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-139/>

# Amazon interview Experience | Set 140 (Experienced for SDE)

Hi, Recently i had interviews with Amazon.

**1st Round (Telephonic):**  
 1. Given an integer array and a constant number X, print all pair of number in the array whose product is equal to X.  
 follow ups: how will you do in O(n)? how will you handle duplicate pairs?  
 Code was required on collabedit.

http://stackoverflow.com/questions/3757393/given-a-number-p-find-two-elements-in-array-whose-product-p

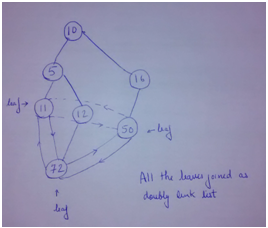
2. He asked do I know level order traversal of binary tree. He ask me to code then, he changed the question and asked about spiral order traversal of binary Tree and asked me to code it.  
 <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

**2nd Round (Telephonic):**  
 1. In a BST two nodes were swapped. Given the pointer to root node find the two nodes and rectify the tree. He asked the approach then asked me to code the same in collabedit.  
 <http://www.geeksforgeeks.org/fix-two-swapped-nodes-of-bst/>

2. Given an integer array, find and print three element in the array whose product is maximum. Code was required.  
 <http://www.technicalypto.com/2010/05/find-three-numbers-in-array-which-forms.html>

**3rd Round (face2face onsite)**  
 1. Given a sorted array of n integers, count and display number of triplets such that a[i]

2. In a given string some of the characters are replaced by question mark, and you can replace question mark with any character. Given such a string find total number of palindrome that can created. String contains only [a-z] characters and question marks can also be only replaced by [a-z].  
 Example:  
 Input String: String str=”a??a”  
 Output: 26

3. Given a binary tree all the leaf nodes in the form of a doubly linked list. Find the height of the tree.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/amazonInterview1.png)

**4th Round (Hiring Manager Round):**  
 Detailed discussion about previous company work?

Why I want to leave my previous employer?

Why Amazon?

What if I don’t like the work?

What are challenges I have faced in my work, how I resolved it?

Weakness and strength?

What does router do, what is static routing? Given a routing table, how would you decrease the time taken by router to decide to which router packet must be forwarded?

Details of algorithm that could be implemented and discussion time and space complexities.

**5Th Round (Face2Face Onsite):**  
 1. Given N sorted LinkList of different length, merge them into a single sorted link list. Pseudo code was required.

2. Given a number d and size of array N. Print all combination of element in the array such that first element of array is d and next element in the array can be +1 or -1 the previous element in the array. Code was required.

E.g. Input: d=4 N=3  
Output:  
 4 3 2  
 4 3 4  
 4 5 4  
 4 5 6

3. What is LRU and implementation of lru? Write pseudo code for the same.

I would like to thanks GeeksforGeeks for providing us such a learning platform.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-140-experienced-sde/>

# Amazon interview Experience | Set 141 (For SDE1)

**Online written**  
 20MCQS + 2 coding question in hacker rank  
 1. Find the pattern in string (Use Kmp)  
 2. Rotate matrix by 90.  
 See in this round your code should pass all the test cases given

**Telephonic round**  
 Find the loop in linked list and also given the starting node from where the loop starts.

Print the tree in zig zag traversal  
 They have share the http://collabedit.com/ link, where i was writing the code.  
 Solution should be optimized.

**Face 2 face Interview at Hyderabad(4 rounds)**  
 1. You have given n point in a coordinate system.What you have to do is to find minimum k distance point from origin.  
 Sol i have given the solution using insertion sort .i have taken a array of size n and while calculating the distance, entering the distance in the array in sorted fashion.  
 second solution i have given using heap, storing the first k distance in heap, then iterating the n-k element.

2. Print the tree in zig-zag traversal

3. U have given large stream of m size and you have size of n window . you have to find the k minimum in each window . we are shifting the window by one at every iteration.  
 sol: I have used self balancing tree.First i have entered n element in tree and do in order traversal upto k to find k minimum element.Now shift the window by one .Now we to remove first element(logn time req) and insert the new element(logn time). Initially i was thinking for solution using big extra space which was not accepted by the interviewer. Assume for every question they asked what if you have 10 million data so your approach will fail if you have taken extra o(n) space.Code should be scalable enough

4. N process can write at time in buffer and n process can read through buffer.Design a system for read and write.

5. words are coming through a stream , u have to halt the problem when first repeated words appear.  
 Used trie data structure.

6. N words are given.u have one source word and one destination word .u have reach to destination in minimum edit with the constraint that intermediate word should be from the words given.i have given the solution using graph and used BFS traversal .complexity discussion

7. what happen when u hit url .I have tried to explain it using Django, he is expecting something from domain name server. Be prepared

Complexity concept should be clear(Recursive+iterative both)  
 Other than this a lot of question on my company project and my performance rating. experience of professional life.

Should know each and every single word of resume.

**Good luck**

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-141-sde1/>

# Amazon interview Experience | Set 142 (Off-Campus for SDE-1)

**Round 1: Telephonic**  
 Q1. Implement some functionalities of Minesweeper like connected component search and game termination check etc.

Q2. Linked list random pointer question.  
 <http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/>

Q3. Given a matrix of 0s and 1s find the row that contains maximum number of 1s.

Q4. Given a node in a binary tree, find all the nodes which are at distance K from it. Root node is also given.

Next day, I got the call for onsite interviews.

**Round 2:** Onsite round by SDE – 1  
 Q1. Given very large number of empty crates of varying sizes, we need to find the best fit crate for the given item and allocate it. Need to design a data structure for this scenario. Operations involved:

1. Insert a crate
2. Search the best fit crate
3. Delete the crate after allocating it.

e.g. 3 crates of weight 10, 20 and 30 are there. An item of size 15 appears then we’ll allocate crate of size 20 and delete it.

Sol. Use binary search tree (balanced using red-black criteria or any) and implement ceil function.

All operations will be O (log(n)).

Q2. Optimize above data structure for weekends where amazon have lots of crates but very less search operations.

Q3. Given a function boolisValidWord(string str) you need to check whether a string is a proper string or not. E.g. iloveicecream is valid : I love ice cream.

**Round 3:** Manager of some other Team  
 Deep discussion on projects.  
 In one project I used EC2 service so he asked me many details and why I preferred EC2 over other possible options.

Buy and sell stock question.  
 <http://www.geeksforgeeks.org/stock-buy-sell/>

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>  
 General discussion on virtual memory.

**Round 4:** 2 SDE-1s  
 Q1. Given matrix of 1s and 0s where 0 is water and 1 is land. Find number of islands.

Q2. Give the size of all islands in above question.

Q3. <http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/>

**Round 5:** Dev Manager, 6yrs exp. (May be bar raiser round still I am not sure :P)

Q1. We started our discussion for very general problem where we have a long stream of characters and we need to extract all the patters from that stream. There can be integers, fractions, words or anything.

I explained the entire process which is used in lexical analysis phase of compiler design where we give regular expressions and finally they are converted to NFAs and finally a single DFA.

Then a discussion went on how we’ll implement this system from scratch.

There are many algorithms for converting regular expressions to NFAs and finally DFAs and some general discussion over Natural Language Processing.

<http://algs4.cs.princeton.edu/54regexp/>

Q2. Given M sorted linked lists of each of size N, we need to merge them to single linked list of size M x N using no extra space.  
 Next day I got the call that they would like to extend me the offer for SDE-1 profile.

**Important Tips:**

1. Prepare data structures thoroughly.
2. Less efficient solution is much better than no solution.
3. Adopt incremental approach for problem solving.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-142-campus-sde-1/>

# Amazon Interview Experience | Set 143 (Off-Campus for SDE-1)

Experience: 5 months

**F2F: 1st round**  
 1. Tell me about your college project.  
 2. Write a Code to check if linked list is a palindrome without using extra space.  
 3. Write a Code to print zizzag traversal of tree.

**F2F: 2nd round**  
 1. Tell me about your college project.  
 2. Tell me about your current project.  
 3. Nodes of a binary tree are randomly inserted in to an array Write a Code to tell the index in array where root of tree is present.  
 4. Given an array whose size is

**F2F: 3rd round(Hiring manager)**  
 1. Deep discussion about my current project i am working on.  
 2. Discussion on my college project and how its useful for company like Amazon.  
 3. write a code to insert an element in sorted circular linked list.  
 4. write a code to find the nth Fibonacci number.  
 5. Design an linux file system.  
 6. Puzzle:Given 9 coins out of which 8 are of same weight except one and you are given  
 a Beam balance.you have to find that one coin in minimum no. of comparasions.

**F2F: 4th round (senior Technical manager)**  
 1. Deep Discussion on my current Project.he asked every minute detail of my project.  
 2. given an sorted array of integers and an element x write a code to find the number of  
 occurrences of x in array if not present return -1.  
 3. write a code to find the median in a running stream of integers.  
 4. Some behavioral questions like: why do you want to leave your previous company so early?  
 Tell me some incidents when you haven’t meet the deadline and what do you have learn from that? etc

I would like to thanks GeeksforGeeks for providing us such a useful platform for interview Preparation.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-143-campus-sde-1/>

# Amazon Interview Experience | Set 144 (Off-Campus For SDE-1)

**F2F Round 1:**  
 1. Tell me about yourself.  
 2. Tell me about any challenging work you did in any of your past projects, why was it challenging?  
 3. Given an unsorted array find maximum distance between two elements considering the following condition:  
 Arr[i] 4. Given a binary tree add all greater node values in a smaller node value .  
 <http://www.geeksforgeeks.org/add-greater-values-every-node-given-bst/>  
 After this was done, he asked to do it without using pointer variable parameter.

**F2F Round 2:**  
 1. Given an array of words, print all the words which are not anagram of any other word. For example, Input {“cat”, “dog”, “tac”, “god”, ”rat”, ”toy”, “act”}, Output{“rat”, ”toy”}.  
 Variation of this <http://www.geeksforgeeks.org/given-a-sequence-of-words-print-all-anagrams-together-set-2/>  
 2. Given a tree connect all the nodes at same level in both directions  
 Variation of this <http://www.geeksforgeeks.org/connect-nodes-at-same-level-with-o1-extra-space/>

**F2F round 3(Hiring Manager):**  
 1. Tell me about self.  
 2. Why do you want to change your current company? Why Amazon?  
 3. Tell me about your current Projects. What is your role? Tell me architecture of this project?  
 4. Design a class to implement Linux File system.  
 5. Have you used twitter? Tell me working procedure of tiny URL.  
 6. How facebook works for following:  
 What data structure will you use to store friends and friends of friends?  
 Design structure for friends list, friend request sent list, received friend request list, store message, notification etc.  
 7. What happens when we type www.amazon.in ?  
 8. How does DNS work, what protocol does it use DNS what is difference between UDP in TCP. Which protocol will you use when I will ask to design DNS  
 9. Insert a node in linked list in sorted order; again modify the same code to work for circular linked list.

**F2F round 4(Senior Technical Manager):**  
 1. Tell me about yourself.  
 2. Why do you want to change in your current company. Give two reasons why do you want join Amazon.  
 3. Deep Discussion on Projects I have worked on, Challenging part in these projects, why was it challenging?  
 4. Tell me a situation where you did not complete your work in given time.  
 5. Have you made any mistake any time in your project and what was its impact on projects?  
 6. Given array of 0’s and 1’s. All 0’s are coming first followed by 1’s. find the position of first 1  
 Ex 0000111 o/p : 4  
 Again he modified it . Do the same if stream is coming 00000000……..1111111……  
 In less than O(N)

Thanks to GeeksforGeeks for providing such a wonderful resource for interview preparation.

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# Amazon Interview Experience | Set 145 (Off-Campus)

I have been working with Amazon for last 2 years and 4 months. Here, is my interview experience when I was the interviewee:

Off Campus Drive (DCE) – 2012

**Written test:**  
 1-> WAP to merge two linked lists like:

list1: 1->2->3->4  
 list2: 5->6->7  
 o/p list: 1->5->2->6->3->7->4

2-> Given two trees T1 and T2. WAP to check whether T1 is a subtree of T2 or T2 is a subtree of T1

3-> WAP to find maximum sum sub-matrix from a give matrix.

**Round 1:**

1->You are given a sorted but rotated array of integer like: 6 7 8 1 2 3 4 5  
 You have to search an element…  
 I answered with an O(logn) solution…  
 then he asked me to write the code…

2->What is the diameter of a tree?  
 I answered…  
 then he asked me to write the complete code…

3->He asked me a design problem “you have to design a class “DeckofCards”…with 2 operations: 1:Shuffle 2:Pick”  
 Pick would pick a random card from the deck and Shuffle will shuffle the cards and give you back the deck of cards.  
 I answered with 2 options 1.LinkedList 2:Array…then there was a discussion around 15 mins over both the solutions…

**Round 2:(I guess it was the bar-raiser round)**

1-> My Introduction and My Projects (all 1 by 1 except the last)

2-> How to compute all possible solution of A^3+B^3=C^3, where A,B,C belongs to (0 to N)?  
 Write code…

3-> How to compute A^n where n Write code...

4-> A tough “matrix with a mask” problem…I took around 20 mins to solve it.

5-> Why Amazon, what is scalability and questions from my answers…like how would you manage millions of requests…

**Round 3:**

1-> You r given a matrix of 0s and 1s. WAP that check if an element is 0 or not and places zeros to all the col and row of that element.

eg: i/p: 1 1 1 1 o/p : 1 1 0 1  
 1 1 0 1 0 0 0 0  
 1 1 1 1 1 1 0 1  
 1 1 1 1 1 1 0 1

2-> How to find a largest palindrome from a given string? Write code….

3-> How many Data Structures you have implemented by yourself?

4-> Given some words(written in lexical order) of some unknown language…You have to find lexical ordering of all the alphabets…  
 Like in english lexical ordering is A B C…Z

**Round 4**  
 Forth round was just related to my projects and subjects…(Paging, Deadlock, Trashing, JAVA and C, Synchronization, etc) + 1 final algo question “How to find all anagrams in a dictionary” Solution was in O(1)..

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I am happy to contribute to a community that helped me learn so much  This mail contains info about a recent interview I had with Amazon.

# First round

**Question 1**

**Problem statement:** Given an Amazon reviews paragraph containing several words, find the minimum distance between two given words.

**Example:** Following is a hypothetical paragraph in an amazon review –

“Amazon is the best company to work for. The amazon is a beautiful forest.”

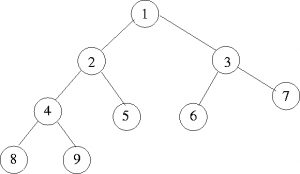
Find the minimum distance between ‘Amazon’ and ‘The’

**Given:** You are given the position of each word in the paragraph. Meaning, you know that word ‘Amazon’ occurs at positions 1 and 10, and ‘The’ occurs at 3 and 9. You do not have to parse the paragraph to gather this info.

**Sub questions :**  
 \*Which data structure will you use to store the given info?  
 \*Compute the minimum distance in the most efficient way.  
 \*Give a working code for the same.

**Question 2**  
 **Problem statement:** In a binary tree, a chain can be defined as sum of length of the left node series, right node series, and 1. Find the length of longest chain in the tree.

**Example:** Refer to the image given below –

Chain length of node 1 = 3 + 2 + 1 = {count of 3 corresponds to node 2 , node 4, node 8 ; count of 2 corresponds to node 3, node 7 ; 1 corresponds to node 1 itself}  
 Similarly, chain length of node 2 = 2 + 1 + 1  
 The max chain length here is of node 1 which is 5. So, the output should be 5.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/tree1.png)

**Sub questions:**  
 \* Provide a solution, optimize it, give a working code or pseudo code or an algorithm for the same.

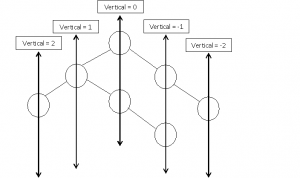
# Second round

**Question 1:** Given two valid dictionary words, find the minimum number of steps required to transform first word to second word. Following are the transformation rules –

1. You can, in a single step, change a single letter in the word.  
 2. Each transition should result in a valid word. Assume you have been provided a helper function boolean isValid (String word) which tells you if a word is valid or not.  
 3. This must be done with minimum transitions.

**Example:** Transform CAT to TOY. One of the several possible transformations is CAT -> CAR -> TAR -> TOR -> TOY

**Question 2 :** Assume you have been given a binary tree such that the angle between horizontal and the line joining node to it’s left child (or right child) is 45 degree. This essentially means node 5 and 6 in the tree figure above collapse into a single node. A vertical for a tree is defined as shown in the figure below. Given a binary tree of the kind defined above, find the number of verticals that can be drawn.

**Example:** Refer to the diagram below to get an idea on verticals.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/vertical-tree.png)  
 ?  
 **Sub questions:**  
 \* Provide a solution and also provide a working code for the same.

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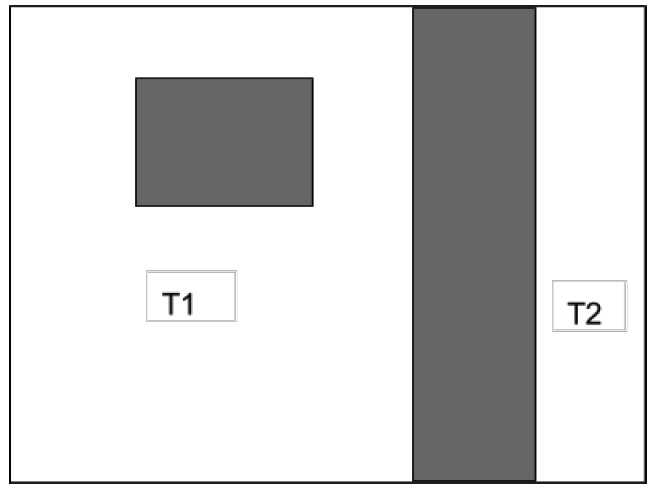
### Source

<http://www.geeksforgeeks.org/amazon-interview-questions-set-146/>

# Amazon Interview Questions | Set 147

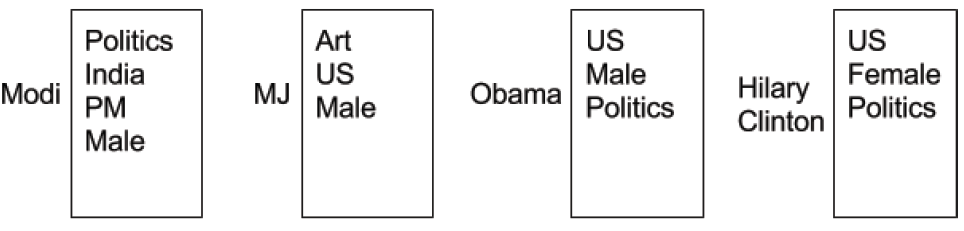
**Written round:**  
 1- Given a sorted array.Make a balanced binary tree from this array.  
 2- A row and column wise 2d sorted array is given which only contains 0s and 1s in each row. Find the row which is having maximum number of ones.  
 3- Find the next greater elements in array.

**Face to Face 1**  
 1- Given a row and column wise 2d sorted array. FInd an elements in it.  
 2- Given a row and column wise 2d sorted array.Find the kth element in this array.  
 3. Given a tree T1 and T2.Find whether T2 is subtree of T1 or not.If not return -1.

**Face to Face 2**  
 1. Given a 2D rectangle.In this rectangle there is some blocked areas which are shown in shaded part.Find the area which is left.Ex-like in this image one unbounded area is T1 and second is T2.You have to find both areas differently and print it. Hint-Take each block as 1\*1 and apply dfs for all blocks.  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/amazon1.png)

2. A big unsorted array of numbers are given.Each number is big of almost 10bits.How to sort these numbers?  
 Ans-Counting sort  
 3- An Adjacency matrix is given which is represented by 2d array.and each field is having cost associated.You are also given source and destination points.Find the maximum cost to reach from source to destination.

**Face to Face 3**  
 1. Discussion on work in my current company.  
 2. What is memory corruption,stack overflow,memory not available.  
 3. what is difference between multiprocessing and multithreading? Do all threads of one process is having there own code,bss,stack and heap or it is common for all.  
 4. what is Tail recursion.How tail recursion works.  
 5. Can we overload a function by only changing its return type?  
 6. How virtual table works and lots of c++ concepts.

**Face to Face 4 (With Manager)**  
 1. Tell me about yourself.  
 2. What is the most challenging condition you have tackled in your life.  
 3. What you will do if you have conflict with your manager.  
 4. Guys this question brainf\*\*cked me.The question was based on “20 question game”.I never played this game. This was the actual question-  
 [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/amazon2.png)  
 Given a set of words like Modi,MJ,Obama,Hillary Clinton.We need to create a intelligent computer game so that it will popup minimum questions to find out the answer the player thought. For ex- If give user choices to chose any word from Modi,MJ,Obama,Hillary Clinton.Now computer will show popup from any of the tags.Like if user chose Modi then in this case computer should ask minimum questions to find out what will be the guess.so in this case computer only askd “PM” tag and computer will show the popup “Modi”.

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<http://www.geeksforgeeks.org/amazon-interview-questions-set-147/>

# Amazon Interview Experience | Set 148

**Round 1:**

1. Incoming stream of characters () defines an onion of depth 1, (()) of 2. Find all onions with their in an incoming stream of characters. Discuss complexity.  
 Stream can be (()) () )) ((( (

2. Biggest challenge faced / where you innovated?

Resume Project:  
 i. Demonstrate High Level Design

3. Parking Lot Problem A, B , C lots with different car sizes. Efficient way of allocating available slot.  
 A: Maintain linked list of available slots. Complexity discussion.

**Round 2:**

1. Matrix of 1s and 0s. 1s are sorted in beginning of each row. Find  
 an efficient way of finding the row with maximum 0s in it.  
 A: Find row which has lowest sum. Complexity discussion.

e.g.  
1 1 1 0 0 0  
1 1 0 0 0 0  
1 1 1 1 1 1  
1 1 1 0 0 0  
1 1 1 1 0 0

2. How to find two sets(of size m,n) are dis-joint(have no elements common) efficiently  
 A: Use hash map. Complexity is O(n) in worst case.  
 Follow up Q: How are hash maps stored in memory?

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-148/>

# Amazon Interview Experience | Set 149 (On-Campus for Internship)

**Round 1 (Online):**  
 It had 20 MCQs and 2 coding questions for 90 minutes. Questions were from Operating Systems, Data structures, Aptitude etc. Most of them were exactly same as on [www.geeksquiz.com](http://www.geeksquiz.com/).

In MCQs there was – 0.25 marking for every wrong answer and +1 for right answer. Coding questions were of 10 marks each.

Coding Questions:

Q1. Find the first non-repeating character in a string.

Q2. You are given a phone keypad like following diagram, where each character corresponds to a digit mentioned in the same box.

[](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/phoneKeyboard.png)

You are given n strings and you have to find their decimal representation. You have to print the string and corresponding decimal representation in descending order. For example, if you are given “amazon” then its corresponding decimal notation will be 262966. If more than one strings have same decimal notation then you have to print them in the order in which input is given. The given string consists of lower case alphabets only.

Test Case 1:  
5  
Amazon  
Microsoft  
Facebook  
Aa  
Bb  
  
Output:  
642767638 microsoft  
32232665 facebook  
262966 amazon  
22 aa  
22 bb

**Round 2 (Face to Face):**

Q1. Given a linked list, write a function to reverse every k nodes.

Example:  
Inputs: 1->2->3->4->5->6->7->8 and k = 3   
Output: 3->2->1->6->5->4->8->7   
  
Inputs: 1->2->3->4->5->6->7->80 and k = 5  
Output: 5->4->3->2->1->8->7->6

Q2. Given an array arr[] of integers, find out the maximum difference between any two elements such that larger element appears after the smaller number in arr[]. Print the indices of the two elements also.

Example: If array is [2, 3, 10, 6, 4, 8, 1] then returned value should be 8 (difference between 10 and 2). If array is [ 7, 9, 5, 6, 3, 2 ] then returned value should be 2 (difference between 7 and 9).

**Round 3 (Face to Face):**

There was brief introduction. Then he asked some questions from my resume. He asked me to tell about a project which I loved the most and felt proud after doing it successfully. He was interested in knowing the details of the implementation in that project.

After that there were 2 coding questions:

Q1. Given a string, find the longest substring without repeating characters. For example, the longest substrings without repeating characters for “ABDEFGABEF” are “BDEFGA” and “DEFGAB”.

Q2. Given a log file of page visits of a website by different users for a day.

Entry in the log file is like this:  
 User 1 visited Page 4  
 User 3 visited Page 2  
 User 7 visited Page 9  
 .  
 .  
 .

Design an efficient data structure which supports queries like the following:  
 Which page was visited by exactly 2 users in day?  
 Which page was visited by only one user exactly 2 times in a day?  
 Which page was visited by ‘User 3? more than 5 times in a day?

In 2nd and 3rd round, we had to write code on paper.

The overall interview experience was quite good. They wanted the most optimal solutions and gave hints to think in that direction.  
 I was finally selected 

Tips:

1. First explain the approach, then start coding.
2. Try to interact with the interviewer while coding on paper. They don’t want to get bored while interviewing.
3. In case of any doubt, clarify it asap.
4. Never ignore the hints given by the interviewer.
5. Be 100% honest.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-149-campus-internship/>

# Amazon Interview Experience | Set 150 (SDE1 for 1 Year Experienced)

**Telephonic:**

**Round 1**

**Round 2**

2. Dont remember

**Round 3**

1.word frequency of a stream of words (no code required, explain trie method)

2.code to count no of words in a stream of characters

**Round 4**

Time and space complexity must for all questions  
 Start from brute force and go to optimized solution.  
 All edge cases are to be covered in code?  
 Think out loud all the time (so that even when questions are easy they will catch your thinking with greater importance)

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-150-sde1-1-year-experienced/>

# Amazon Interview Experience | Set 151 (For SDE)

**Online Round**  
 1. Convert Binary tree to linked list.  
 2. Rotate a matrix by 90 degree.  
 There were 2 more questions. But I forgot what were they?

**Telephonic Interview**  
 Overview of my resume, current role responsibilities and asked to explain internship project in brief.  
 1. What is the definition of tree ?  
 2. What are the differences between graph and tree?  
 3. When can you say a graph to be a tree?  
 4. Write a program to show whether a graph is a tree or not using adjacency matrix.  
 Its always good to ask questions at the end. It shows our interest towards the company.

**F2F 1**  
 Overview of current job responsibilities and internship project.  
 1. Convert a tree to a sum tree.

Example :  
 1 27  
 / \ / \  
 2 3 -------> 9 13  
 / \ / \ / \ / \  
 4 5 6 7 0 0 0 0

Always take care of all the corner cases  
 2. Print a pascal tree .  
 3. Given a 2D matrix sorted row wise and column wise . Print the matrix in sorted way. (Can be done using Min Heap).  
 For all the questions, complexity of the program was asked and was being asked to improve both time and space complexity.

**F2F 2**  
 Many questions regarding my current project, tools and technology I am working on.  
 1. Convert a binary tree to a sum tree . Here he had a new meaning of sum tree.  
 Example :

Example :  
 1 1  
 / \ / \  
 2 3 -------> 2 5  
 / \ / \ / \ / \  
 4 5 6 7 4 9 15 22

(I did it with Level Order Traversal) (Complete working code was required)  
 2. Given an array of integers. Find the largest 3 element. (Can be done using Max Heap in less time complexity)

**F2F 3**  
 Lots of questions on my current work and tools which I was using.  
 Why do I want to leave my current company on such a short interval of 5 months.  
 Why Amazon ?  
 What inspires you to join Amazon? Why dream company ?  
 1. Connect Sibling pointers. I gave a Level Order Traversal solution. He asked to do it in O(1) space complexity. I explained the approach but messed up In writing the working code for that.  
 2. Explain the approach of LRU cache and implement using object oriented language.

**F2F 4**  
 Why Amazon?  
 Why do you want to leave your current company in such a short interval?  
 Did u ask your current company to provide that type of work as u r looking in Amazon?  
 1. Design a system for finding the costliest element always whenever we pick up an element from a box.(concept of Max Heap)  
 2. A stream of data is coming. Maintain records in a page and mechanism to see previous and next page. (Concept of Doubly Linked List)  
 (It is always advisable to ask questions in design questions. The interviewers expect that we will be asking questions for clarification)  
 What is thread?  
 What is the meaning of memory leakage?  
 Followed by many OS questions but I forgot.  
 In every round , after each question , complexity of the algorithm was asked. Its good to ask questions to get more clarification about the question.

I want to thank the entire team of geeksforgeeks. It is a great portal and it helped me a lot in preparing for Amazon interview.

Reference – GeeksForGeeks and Cracking The Coding Interview

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-151-sde/>

# Amazon Interview Experience | Set 152 (Kindle Team SDE-1 )

Recently I have participated in Amazon SDE interview for Chennai location Kindle team. Kindle team has arrived Bangalore location to take drive.

I have given 8 rounds

Questions- Answers are as below

**R-1) Written Test 1 :**

Three codes were asked :

1) Find whether given LinkedList is Palindrome or not

2) Find Whether given Binary Tree is Binary Search Tree or not  
 Code : <www.gohired.in/2014/07/check-binary-tree-is-binary-search-tree.html>

3) Create Regular expression and String Matching program for ? and \*, where. \* means any null or character may appear instead \*. and ? means one or more previous character may appear in string.  
 example  
 input :  
 AM\*AZO?N\*, AMAZON  
 AM\*AZO?N\*, ABAZOO  
 Both are matching as per rules of ? and \*.

After removing several candidates from process they conducted second round written.

**R-2 ) Written Test 2 :**

1) Stoke prices are given in array. Find for which duration I can buy and sell Shares to get maximum profit.  
 We need to first explain our method and then star writing code.  
 – After this round some 20 candidates left.

**R-3) Face to Face Round 1 :**

They discussed for all this 4 questions and why I choose to write this answer, some modification in question to see whether u can think more in deep , or several conditions changed, and they asked to redesign/rewrite answer.

**R-4) Face to Face Round 2 :**

Q1) Class diagram of one system ( don’t remember question)

Q2) Find Leader in Array ( Leader means an element which is higher than all number which are indexed higher than element )  
 Solution Traverse array from behind to find such elements (simple method)

Q3) K sorted Linked Lists are given sort them in one ( write sudeo code )  
 Then he told me to give logic to solve question without using auxiliary array ( result array )  
 I did with in-place method, searching and storing nodes in one linkedlist only.

**R-5) Face to Face Round 3 :**

Only One question was asked : Rotate Array “D”times.

Different strategies discueed, He was impressed with my another method to find new array location based upon array size N and D.

**R-6) Face to Face Round 4 :**

Questions were from different topics like

    -OS fundamentals  
 like fork, child process creation and output if I use fork().  
 What is deadlock, write sample C code to create deadlock.  
 What is mutex, etc.

     SQL Fundamentals.  
 Data Structure used in Query,  
 Sample Query like finding Manger’s name and Fundamentals of join

     -Other General Quesions  
 How Google Search engine works. Where Query goes their server, data storing etc  
 What happens when you click on website address.

     -Design GAME.  
 GAME is like two players are fighting and ( kind of street fighter ) and design class diagrams and methods for this GAME, I can think any functionalists(like health, power, help from friend, etc ) any extra thing apart from which he mentioned.

    – API is given, and this API servers different clients,  
 Now one client has requirement so that functionality changes, but other clients dont need such functionality, how will you design your system.

    – OOPS fundamentals were discussed like  
 Static, Class can be protected or not, overloading and overriding difference and implementation of them,

Software patters discussed like Factory and Abstract Factory

Singleton and how to implement it.

    Last Question was, If I want to store student data such that some students took Physics, some took Chemistry and some took both. I want to know all details of students, mark, name etc also. which way I’ll implement this system, which Data Structure will be used, and which design pattern.

After All this round I was told to go home and Hiring Manager Round will be taken onsite at Chennai, I was told.

for One month my rounds were not scheduled.

One fine day I got change to give Project Manager round over phone ( they said Senior Manager will take onsite round and then HR round will be there)

**Round 7) Hiring Manager Round.**

Over call he asked me first question

Q1) Array is given which is of 0 and 1, all connected 1 forms island.  
 Find largest size island in given Array,  
 I have provided working code, He then asked me to optimize and again writing code.

Q2) Design LRU system. I have explained this  
 and also class diagram and pseudo working code was submitted.

Again for 20 days I didnt got call from HR and when I used to mail him, He simply replied that my candidature is on hold as Senior Manager is not free to take my next round.

And Today Again I got call that I am rejected. because Hiring Manager is not convinced from my approach in round,

I still don’t know what went wrong as both code given to HM were working.

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Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-152-kindle-team-sde-1/>

# Amazon Interview Experience | Set 153 (For SDE1)

Recently I had interview with amazon.com for SDE1 position for 1+ year experience. It was kindle team.

**Round 1: 1 hour – written test at amazon office.**  
 Q1. Given two link list that represents no. write a program to add two given two link list and return new link list that represents sum of no. represented by given two link lists.

Q2. Given a string, write a program to find longest length palindrome from that given string. You can swap the characters of given string.

Q3. <http://www.geeksforgeeks.org/count-possible-decodings-given-digit-sequence/>

**Round 2: 1 hour – with SDE1**  
 Q1. find longest common prefix of given set of strings.

Q2. Check whether given link list represents palindrome.

Q3. Given sorted array, write program to generate balanced binary search tree from given array.

**Round 3: 2.5 hour – with SDE1 + SDE2**  
 Q1. Count no. of inversion in a given array.

Q2. In a party there are total n persons are there. every person is having one gift with him. Every person will give his gift to another such that every person at the end has exactly one gift. Any one can give his gift to anyone. say 5 people (A,B,C,D,E).  
 A–>D  
 D–>C  
 C–>E  
 B–>A  
 E–>B

write a program to generate a random sequence. for every run, code should generate different sequence with equal probability. lots of discussion was there on various approaches. finally with the help of interviewer i wrote O(n) time solution with O(1) space. Hint: selection sort

**Round 4: 1.5 hour – with SDE2**

Q1. Given a file having many words. Given K, find the words appearing >=K times. Lots of discussion was there, discussed many approaches.

Q2. Design data structure that supports insert(), remove(), find-max(), delete-max() operations. All operations should run in O(1) time. Lots of discussion was there, discussed many approaches.

Q3. Given two link-list that represents polynomial. Write program to multiply both polynomial , return result as new link-list.

Q4. Write program to find max size BST from given binary tree. Algorithm and full working code was required for all the problems. Discussed space and time complexity of every problem.

Still hiring manager round and senior manager rounds are there. Once completed i will post

**Tips:** Discuss various approaches with interviewer. Try to interact continuously with interviewer. they were very friendly during interview.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-153-sde1/>

# Amazon Interview Experience | Set 154 (For SDE2)

**Round 1:**  
 1. Print level order traversal of binary tree in iterative & recursive way.  
     Print each level in next line. –> I used 2 variables for this.  
 2. convert HEAD -> TAIL and print all words in successful transformation path.  
     constraints: Only one character can be changed at a time.  
 Transformed words should be valid. It can be checked using dictionary.

**Round 2:**  
 1. Check if tree T1 is a subset of tree T2.  
 2. find Kth minimum element in a row-wise and column-wise sorted 2-d array.

**Round 3:**  
 1. Project Role and related discussion  
 2. Find distance between two nodes in a binary tree.

**Round 4:**  
 1. Design an Email client. should be having all features of email-client.  
 2. Transfer one file data from one PC to another PC. To transfer data some network entity is being used which cost some value. You need to reduce this cost of transferring the data. —> I used compression technique to replace repetitive data with some key on first PC and put it back on another PC.  
 3. How smart mobile/tv apps gets updated  
 4. Project role.

**Round 5 (Hiring Manager):**  
 1. Project Role deeply.  
 2. Any critical problem you have faced.  
 3. C++ -> polymorphism, abstract class, abstraction, overloading, compiler given default n copy constructor.  
 4. Spiral matrix puzzle.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-154-sde2/>

# Amazon Interview Experience | Set 155 (On-Campus)

Recently Amazon came to our campus as a part of our campus recruitment.

**Online Round:**

1) Given a linked list of zeros and ones, sort the list.  
 2) You are given three numbers. Each number is represented by a linked list. Write a function that returns sum list.  
 Example: 1->2->3 + 2->1->3 + 3->2->1 = 6->5->7.

This was conducted on hacker rank. Test duration was 1.5 hrs  
 There were around 22 MCQs related to OS, OOPs C Input/Output questions. GeeksQuiz is sufficient to answer these questions.

They shortlisted 25 people for the interviews.  
 There were 4 technical rounds in total. Every round is an elimination round. In each round interviewer asks you to explain the algorithm as well as implement it on the paper.

**First Round:**

Started off with a basic “Tell me about yourself” question. This round is just to check if you really are capable. He asked me three questions and asked me to implement all of them on paper.  
 1) You are given an array and a number c. Ouput all pairs a, b whose sum is equal to c. O(n) is expected.

2) You are given a number represented by a linked list add one to it.  
 I told him the obvious reversing the list and add one to it. But he wanted me to do it without reversing and using recursion.

3) You are given a sorted array, find majority element in it. If there is no such element output -1. You have to do it in single o(logn) operation.  
 Extension to the third question: What if the array is not sorted? Provide an o(n) solution.

**Second round:**

This was for about 2 hours. Although there were only two questions but the interviewer is checking if we have enough knowledge on all the data structures.

1) You are given a long array and window size w. You can only view elements that are currently in the window. Window starts at the extreme left and moves one position at a time to the right. You are required to output minimum numbers in the current window.  
 All the possible approaches were discussed. Starting from brute force, o(nw) to o(nlogw) using heaps, BSTs. He asked me to implement them. But he was not satisfied with o(nlogw) solution. He wanted me to give a o(n) solution. Finally after few hints I’ve solved it using doubly linked lists.

2) You are given a binary tree. Print the vertical order traversal starting from the root element.

**Third Round:**

Started off with the question “Explain one project of yours”. Few technical questions were asked on the project.  
 Few questions on OS, Multithreading vs Multiprocessing were asked. Also he asked me to tell if I have implemented any program that used multi threading. Few questions on semaphores and mutexes were asked.  
 Only one coding question in this round  
 1) You are given a very large binary tree, return the root node of the largest BST in the given tree. Single traversal solution is expected. Implementing it on paper was little difficult than expected.

**Fourth Round:**  
 By this time, job offer was almost confirm.  
 He asked questions on my projects. He asked me to implement few algorithms from my project on a paper.  
 1) Implement a graph and one graph traversal using oops.  
 2) Given an immutable(non editable) linked list and a number k, remove all occurrences of the number in the list.  
 Few questions on OOPs were asked.

They gave me the result after 20 minutes 

I would like to thank geeksforgeeks which helped me enormously in getting placed.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-155-campus/>

# Amazon Interview Experience | Set 156 (On-Campus)

**Written Round:**  
 There were 21 mcqs and 2 coding questions hosted on hackkerank.  
 Time: 1 hr 30 mns.  
 The mcqs were from c, c++, os, networks for example  
 1. LDAP stands for ?  
 2. 2^30+2^30+2^30+2^30 = ?  
 3. Given three process P, Q, R . P requests resources A, B, C, Q requests B, C, D and R requests C, D, A which of the following orders is deadlock free  
 4. Given a postfix expresion find the value of expresion  
 5. Which of the following is the inorder traversal for the given pre order traversal  
 6 Question based on the precedence order of operators

**Coding questions:**  
 1) Given a graph. Find if a cycle exists and print the nodes in the cycle. If multiple cycles exists print the cycle starting from the lowest index

2) Given a string S and a string T, count the number of distinct subsequences of T in S.  
 S = “rabbbit”, T = “rabbit”  
 3

**Interview 1:**  
 1) Find the diameter in given tree which can start at any node and can end  
 at any node and should have only single turn.

10  
 / \  
 5 8  
5-10-8 has two turns  
 10  
 / \  
 45 56  
 / \ \  
 10 20 45

10-45-10-56-45 has 1 turn  
 20-45-10-56 has 2 turns

2) <http://www.geeksforgeeks.org/find-number-of-islands/>

**Interview 2:**  
 1) <http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem/>  
 2) <http://www.geeksforgeeks.org/given-array-strings-find-strings-can-chained-form-circle/>  
 3) What datastructure will you use for designing lift  
 4) Efficient data structure for minimsing the following operations if we have an array arr[0 . . . n-1].  
 a) Add a value x to array from index l to r where 0 b) Find the value of a specified element of the array arr[i] where 0

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# Amazon Interview Experience | Set 157 (On-Campus)

**Online Round**  
 Initially a test was conducted on hackerrank on the basis of which students were shortlisted. The test contained 22 questions, 20 Gate like MCQ’s and 2 Programming questions. The MCQ’s were on OS(page replacement policies), output, trees etc.

The programming questions are as follows :  
 1) <http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/>  
 10 Bonus marks were there if one could solve in O(n) time.

2) Given 3 numbers in the form of linked list. Give the sum of the 3 numbers as another linked list.  
 Example: 1->2->3 + 2->1->3 + 3->2->1 = 6->5->7.  
 A slight variation to this question :  
 <http://www.geeksforgeeks.org/sum-of-two-linked-lists/>

They shortlisted around 30 people for the interviews. Since some of them got placed on day 1, they were extending the shortlist on realtime also. There were 4 rounds in total. Every round was an elimination round. In each round, I was asked to explain the algorithm as well as implement it on  
 the paper. Every interview started with the typical “tell me about yourself” ice-breaker.

**Round 1 (Technical)**  
 1) Finding LCA in BST.  
 <http://www.geeksforgeeks.org/lowest-common-ancestor-in-a-binary-search-tree/>

2) Finding LCA in Binary tree  
 <http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>

3) <http://www.geeksforgeeks.org/a-product-array-puzzle/>

**Round 2 (Technical)**  
 1) http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/  
 2) You are given ‘n’ appointments. Each appointment contains startime and endtime. You have to return all conflicting appointments.  
 3) Some basic discussion on memoization and dynamic programming.

**Round 3 (HR + Technical)**  
 1) Tell me about yourself.  
 2) Why Amazon?  
 3) Where do you see yourself after 3 years.  
 4) What are your weaknessess? I said one, he asked me one more?  
 5) Lot of questions on my intership project and on the technology used in it, challenges that I faced, best thing I liked about the technology etc etc.  
 6) Some question on my hobbies.  
 7) Finding LCA of a tree whose nodes has only parent pointers.  
 8) Implement a stack from 2 queues.  
 9) Implement a queue from 2 stacks.  
 10) Design classes for a Snake and Ladder game. The focus was on OOPS concepts.  
 11) Some more question on my projects and resume that I don’t remember.

**Round 4 (Technical)**  
 1) Rotating an array. (All approaches)  
 <http://www.geeksforgeeks.org/program-for-array-rotation-continued-reversal-algorithm/>  
 <http://www.geeksforgeeks.org/array-rotation/>

2) [http://www.geeksforgeeks.org/search-an-element-i n-a-sorted-and-pivoted-array/](http://www.geeksforgeeks.org/search-an-element-i%20n-a-sorted-and-pivoted-array/)

In all the interviews, the approach is seen, so taking out loud what you are thinking is must. Its good to point out the problem(s) that are the crux of the question and solving it would lead to the final solution. The interviewers are always very helpful, they give hints whenever required. Just being calm, composed and patient during & between interviews and studying geeksforgeeks will do the work.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-157-campus/>

# Amazon Interview Experience | Set 158 (Off-Campus)

Recently I appeared in for off-campus Amazon Interviews for SDE position and here is my experience.

**Round 1: 1 hour written test**

Q1. Given a string you need to print all possible strings that can be made by placing spaces (zero or one) in between them. For example : ABC -> A BC, AB C, ABC, A B C

Q2. Given a tree where there are three pointers (left\_pointer, right\_pointer and a next\_right\_pointer). Left and right pointers are set like that of any general binary tree. We were asked to set the next\_right\_pointer to the next node in the level order traversal for the same level. This implies means for the last node in every level it will be null for rest it will be pointer to the next node in level order traversal.

**Round 2: 1 hour technical**

Q1. There is a 12 km road and a contractor who is in-charge of repairing it. Contractor updates you about the work which is done in patches. Like “Road between 3.2 km to 7.9 km repaired ”, “Road between 1.21 km to 3.2 km repaired”. You have a manager who enquires about the longest continuous patch so far. It was a long discussion and I gave solution in O(nlogn) where n is the number of updates by the contractor.

Q2. Several Questions were asked from my project.

**Round 3: 1 hours 20 mins**

Q1. There are billions and billions of stars and at any point of time you need to tell the closest million to earth. In what way I should take input for the stars and what all do I need to represent one. I used heap of a million size. Then he also asked about the different approach when I can’t use so much of physical memory for heap.

Q2. Implementation of Least Recently Used Cache. I started with O(n) solution using queue and ended up with O(1) solution using heap and doubly linked list.

Q3. Basically it was from snakes and ladders game. There is n x n matrix and you are at starting position. What is the no. of ways to reach n-square position if your next move will be dependent on number on dice? You have been given information about ladders (there are no snakes J ). I used DP.

There were few others that we didn’t discuss as I told him that I know solution to them.

**Round 4: 1 hour**

Q1. Write an efficient program to count number tree structures that can be made using n number of nodes.  
 Basically T(n)=summation (T(i) \* T(n-i-1)). I used DP as there are a lot of sub-problems used again and again. O(n2) .

Q2. There are n nuts and n bolts represented in two different arrays and a function is\_fit(nut\_i, bolt\_j) which returns 0 if its perfectly fit, 1 if it’s a tight fit and -1 if its loose fit. I was asked to arrange them so that every nut fits perfectly with the bolt in the same position (there is one nut for every bolt that fits perfectly). I suggested O(nlogn) solution.

Q3. Find the kth largest element in a BST. Well that was easy J

We discussed about projects and he asked reasons for leaving present company.

**Round 5: 1 hour hiring manager round**

Most of the questions were behavioral questions like dealing with manager in case of conflicts, reasons for leaving present company, why would you choose Amazon and not Flipkart if you have offers from both, about my projects and contribution to present company.

**Round 6: Technical + Behavioral**

Q1. How to know the time between someone writes Amazon.com and the page appears on his browser for a particular user. I impressed him by suggesting to use dummy request packets after the page is loaded completely sending the time J.

Q2. He showed me the Amazon page they were working at that time and I asked me to suggest 5 changes in 5 minutes.

Q3.<http://www.geeksforgeeks.org/find-a-tour-that-visits-all-stations/>  
 I messed up with the solution in the beginning but reached to solution eventually.

Many behavioral questions were asked too.

**TIPS:**

1. Don’t jump into solutions, ask about the type of input that is given and output that is expected.  
 2. The interviewer always tries to take you to the most optimal solution so listen to what all he says. Many a times they are big hints !!!  
 3.Be honest.  
 4. Keep believing that you will get the job J.

I would like to thank geeksforgeeks team for such an amazing platform to learn and discuss with other geeks.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-158-off-campus/>

# Amazon Interview Experience | Set 159 (Off-Campus)

I recently got an offer from Amazon Delhi. Here goes my interview experience.

**Telephonic Round**  
 Q1. Find kth element from the end of a singly linked list.  
 Q2. Given an array (not sorted) of integers and a number S, find a pair in the array whose sum is equal to S. I gave the sorting solution and was asked to write the code for the sorting algorithm I used. I had used in-place merge sort.

**F2F Delhi**  
 **1st round:**  
 Q1. Detailed discussion on all possible data structures which can be used to implement a set with no duplicates and which supports add, delete and find operations in minimum space & time complexity. I suggested using hashing, BST or array. They asked me to give an example of a hash function which supports uniform distribution but is not collision free. Was asked to write codes for add, delete and find operations using BST.

**2nd Round:**  
 Q1. Rotate an image represented by a 2D matrix by 90 degree.  
 Q2. Given a singly linked list of 0s and 1s, sort it keeping the order intact. I gave O(N) time and O(1) space complexity solution.

**3rd Round:**  
 Q1. Discussion on projects and previous work.  
 Q2. Given stock prices of several days, find the two days so that buying the stock on 1 and selling it on another gives the maximum profit. O(N) time and O(1) space soln was expected.  
 Q3. Given a doubly linked list, reverse every 2 nodes. E.g. 1->2->3->4 will become 2->1->4->3  
 Q4. Several questions on OS, OOP, A few are what is segmentation fault, describe the design patterns you know.

**4th Round:**  
 This round was Bar-raiser round. A bit tricky.  
 Q1. Detailed discussion on projects, best project you have got, the most challenging work, strengths, weaknesses etc.  
 Q2. Given a dump of items sold in a file (not organized), give the top n items sold. Eg. the file looks like:  
 < item1 sold >  
 < item2 sold >  
 < item1 sold >  
 < item9 sold >  
 Also, there might be same items sold but they might have different names because of different vendors. So you also need to count them together (Hint: Use ids of the items).  
 Hint: Use grep command to get the counts.  
 Q3. Collect email-ids of all the persons above 18 yrs in a city. He wanted to see my way of thinking and how do I use software approach towards daily life problems.  
 Q4. There is a signal and two way traffic. Cars are coming @rate 10 cars/sec. Signal remains green/red for 10 secs and when the signal is green, 10 cars/min can cross the signal. You need to tell how many cars are in the line waiting behind the signal on both sides during a particular time. Say you run the simulator at time 0, now after 1 hour you need to tell the no. of cars waiting on both the sides.

I didn’t get selected after this but got a call after 1 month as they wanted to reconsider my profile.

**F2F Hyderabad**  
 **1st Round:**  
 Q1. Some discussion on previous work.  
 Q2. Given a sorted array S of characters say S= {‘a’,’d’,’g’}, you need to find the insertion point of a given character in it such that if it is less than ‘a’, insertion point is 0, if between ‘a’ and ‘d’, insertion point is 1 and if greater than ‘g’, again the insertion point should be 0. O(log n) time soln was expected.  
 Q3. Given a complete binary tree, connect nodes at the same level without using any extra space.  
 Q4. Given a dictionary of unknown language, you need to give the sorted sequence of characters in it.  
 E.g.  
 Dictionary looks like:  
 ABCDE  
 CF  
 DG  
 so the output may look like: ABCDEFG  
 Hint: Topological sort

**2nd Round:**  
 Q1. Given two arrays S1 and S2 of characters. You need to find the smallest length of substring in S1 which contains all the characters of S2. Characters need not be in the same order as in S2. Characters might be repeating in S1.  
 Q2. Given a dictionary like text file, find n top occurring words in it i.e. n words whose count is the maximum. Hint: Use Hashing and Min-Heap.

I would like to thank geeksforgeeks as it helped me a lot while preparing for the interviews.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-159-off-campus/>

# Amazon Interview Experience | Set 160 (For SDE 2)

Amazon sde2 experience:

**Telephonic round :**  
 Design a site similar to junglee.com. Assume you are given a crawler, design a distributed system , what ds will you use , some basic api’s etc.

**Onsite:**

**coding round 1:**  
 1. zig zag traversal of binary tree O(n) algo  
 2. matrix question:  
 given matrix like :

a b e d  
 b c f e  
 a b d d  
 ….

find the longest path of consecutive alphabets given a starting alphabet. You can move in all 8 directions. for eg. a->b(right)->c(down)->d(diagnal down)… len = 4 , find max such len

**coding round 2:**  
 1. is binary tree balanced : O(n) time algo  
 2. given a pre and post order kindof a traversal (2 arrays) create an n-ary treee out of it with struct of the form :

struct node {  
 int data;  
 struct node \*child[MAX];  
 int child\_num;  
}

did it using a hash table of linked lists and storing parents . Might be a btr way not sure.

**design round + hiring mgr 3:**

Design the most recently viewed item for amazon , say 15 most recently viewed item which are scrollable for millions of products and users . scalable and extensible model. give apis , distributed systems, caching , reduce latency : critical

**design round 4:**  
 1. Give Object oriented design for the snake game (that was in old nokia phones) . only class and obj diag was needed, no code/implementation. it should have extensibility to accomodate different types of fruits, (eg one gives + 5 len + 10 pts) it should be scalable to diff platforms

2. Give an architecture diagram with all entities and relationships of a multi user wysiwyg editor . basically a web interface to multiple authors who can edit and store their docs . multiple ppl should be able to save it at once . also ownership should be present for documents.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-160-sde-2/>

# Amazon Interview Experience | Set 161 (Off Campus for SDE-1, Banglore)

Off campus- Delhi drive (SDE-1 Bangalore)

**1st round: f2f**  
 Tell me about yourself.

Most challenging task.

<http://www.geeksforgeeks.org/connect-leaves-doubly-linked-list/>

<http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>  
 Small modification in it. Parenthesis pairs are given in a separate list. You have to optimize the problem by suggesting the method you will need to store the pairs.

**2nd round: Hiring manager**  
 What is the angle between hour and minute hand at 12:15. I said 90’ but corrected myself immediately.

So he told me the importance that for huge no of clients this small mistake can create a blunder.

He asked me a scenario where I faced this thing and thereby improved the time complexity.

Lot of behavioural questions like conflicts with manager, team collaboration etc.

**3rd round: f2f**  
 <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

<http://stackoverflow.com/questions/20026243/find-2-missing-numbers-in-an-array-of-integers-with-two-missing-values>

He asked me if have heard of nut and bolt problem. I didn’t so he moved to next question.

Given an array. Find the maximum number of groups of size of 2 or 3 that can be formed such that sum of the numbers in group is divisible by 3. No number can be reused.

**4rd round: Bar raiser**  
 Convert an integer to its roman. He asked me to consider cases with integers containing 4 and 9. I didn’t understand properly.

He asked me if I I did anything extraordinary apart from my daily work in the office and what challenges I faced.

<http://www.geeksforgeeks.org/largest-subarray-with-equal-number-of-0s-and-1s/>  
 He did not accept this solution and asked me to optimize. This round didn’t go well, so I was not selected.

**Tips:** Solve all the data structures related problems from geeksforgeeks and start practicing to write perfect code for any problem.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-experience-set-161-off-campus-sde-1-banglore/>

# Amazon Interview Experience | Set 162

**Round 1:**

Q-1: <http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem/>

**Round 2:**

Q-1: <http://www.geeksforgeeks.org/search-an-element-in-a-sorted-and-pivoted-array/>

Q-2: Given a string of 0s and 1s, count the number of substring which start and end with 1.

I was rejected after round 2 because I did not do well in round 1, was put on hold.

Was called again

**Round 1:**

Q-1: <http://www.geeksforgeeks.org/write-c-code-to-determine-if-two-trees-are-identical/>

Q-2: <http://www.geeksforgeeks.org/convert-an-arbitrary-binary-tree-to-a-tree-that-holds-children-sum-property/>

**Round 2:**

Q-1: In a tennis tournament of N players every player plays with every other player.  
 The following condition always hold-  
 If player P1 has won the match with P2 and player P2 has won from P3, then Player P1 has also defeated P3.  
 Find winner of tournament in O(N) time and O(1) space. Find rank of players in O(NlogN) time.

Q-2: Given N scientists and K black holes, each scientist can query on radius, size and temperature of a black hole, what data structure would you use?  
 Following queries are important.  
 Which scientist had queried on which black hole.  
 What were the queries made by that scientist.

**Round 3.**  
 Q-1: <http://www.geeksforgeeks.org/maximum-sum-path-across-two-arrays/>

Q-2: <http://www.geeksforgeeks.org/dice-throw-problem/>

**Round 4:**

Discussion on current project in company and college problem.

Questions on OS.

Q-1: Given 2 files find common words.  
 Both files are too large to be loaded in memory.

Q-2: Point of inflexion in an infinite mathematical graph which is strictly increasing then strictly decreasing. Simple binary search was not the solution.

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### Source

<http://www.geeksforgeeks.org/amazon-interview-experience-set-162/>

# Amazon Interview Experience | Set 163 (For SDE II)

Recently I attended amazon bangalore interview for SDE 2 position. All f2f and no phone/written screening as i had attended one before and cleared those. Total 5 rounds and below are the details.

**1)** Coding  
 Given 2 nodes in a binary tree, find the length of the path connecting them (standard)

**2)** Coding  
 Given an continuous input stream of characters, find a method to get the earliest/oldest non repeated character at any time in O(1).(solved using a doubly linked list and array combo)

**3)** Hiring Manager  
 Questions regarding the past projects, challenges (Important! please search google for preparation grid and fill it up, be honest, be consize, your interviewer has gone through hundreds of filmsy, shaky and all kinds of project descriptions and don’t think you can fool him.)

**4)** Design round  
 Design a system where a buyer puts a notification to the social networking site about his transaction.

**5)** Bar raiser  
 Past project discussion, design a cab service system, how would you define the standerds to be ahead of your customers, how to handle scalability issue.

Note:  
 Brush up coding style, you may know the logic, but don’t keep much hope if the code is messy, lengthy and without boundary checks, practice writing code on paper which can run without any modification.  
 Think loud, the interviewer is ready to help you, even to the extent of going into your code and finding bugs, and that does not make you look bad.  
 Think all possible angles when designing. if the line goes down, if there’s a meteor hitting the server, someone is using the design after 20 years, so what might happen. scalability is important for amazon. Prepare your project details and think of your real fault, real problems to tell the manager.

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

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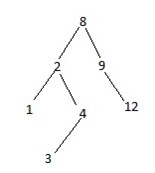
<http://www.geeksforgeeks.org/amazon-interview-experience-set-163-sde-ii/>

# Amazon Interview Experience | Set 164 (For SDE I)

Applied for Chennai Kindle team, cleared few rounds but not happy with the overall interview process. Contacted again by Hyderabad office and scheduled an interview, asked me about my previous experience with Amazon. No telephonic, all F2F as I have already cleared few rounds earlier.

**Round 1**  
 1. Questions on my project with previous employer  
 2. <http://www.geeksforgeeks.org/add-two-numbers-without-using-arithmetic-operators/>  
 3. Given an unsorted array of integers, assume the elements are inserted into BST. Search for an element and print the path if found. If the element is left of previous in BST then path variable is 1 else 0. Eg:

Input: Given array[] = {8, 2, 4, 9, 12, 3, 1}

Corresponding BST would be [](http://d2o58evtke57tz.cloudfront.net/wp-content/uploads/BSTAmazon.png)

Output: Search key = 3 should print “101”,   
 key = 11 shouldn’t print any.

**Round 2**  
 1. Count the decoding for a given digit string. Let say ‘A’ -> 1, B -> 2 and so on  
 Eg :

Input: digits[] = “123”  
Output: 3 //”ABC”, “ LC” , “AW”

2. There is a printer printing characters continuously on paper, you need to cut the required message character by character from the printed paper efficiently

**Round 3**  
 1. <http://www.geeksforgeeks.org/largest-sum-contiguous-subarray/>  
 2. Given a 2D matrix consists of only 0’s and 1’s find the longest diagonal of all 1’s  
 3. Optimization on above question with slight variations.

**Round 4 (Bar Riser from US telephonic)**  
 1. Given an array and an integer k, find the maximum for each and every contiguous sub array of size k Eg:

Input: array[] = [1,2,3,4,5,6], k = 3  
Output: 6, 9, 12, 15

2. <http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/> asked for minimum instead of maximum  
 3. Given an array of positive integers, form a largest decimal number by concatenating integers. Such that the largest number should be divided by 2, 3 and 5.

**Final Round (Manager)**  
 1. Given a BST and a node (say target), find K nearest neighbors (<http://www.geeksforgeeks.org/print-nodes-distance-k-given-node-binary-tree/>)  
 2. As my work with previous employer is very similar to the team I am interviewed for, not much questions rather it was more like a discussion

Production level code on paper with all corner cases handled is expected in all rounds. The interviewers especially Hyderabad team are very friendly and helpful, talk out loud, they are ready to help and guide you to right direction.

Finally, I would like to thank GeeksforGeeks as it helped me a lot in cracking algorithm questions. It’s a great portal, keep up the great work, cheers 

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

Tags: [Amazon](http://www.geeksforgeeks.org/tag/amazon/)

### Source

<http://www.geeksforgeeks.org/amazon-interview-experience-set-164-sde/>

# Amazon Interview Experience | Set 165 (For SDE I)

I received interview call from amazon.com (Bangalore) for SDE1 position for 1.5 year experience.

**Round 1: 1 hour – written test at amazon office.**

Q1. Given a set of strings, find the alphabets common to all strings.  
      <I used Hashmaps>

Q3. Longest Palindronic subsequence in a given string.  
      http://www.geeksforgeeks.org/dynamic-programming-set-12-longest-palindromic-subsequence/>

Q3. Find LCA of two nodes in a binary tree  
      http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>

**Round 2: F2F 1.5 hour**

Given a huge file with large number of words, code a function that would take a word as input and print all anagrams of that word present in the file as output. Function has to be really really fast alsmo O(1) run time. You are allowed to take as much time and resources for pre processing the file once. But after pre-processing function should perform in O(1) time.

<Use hashmap, and fact that all anagrams have similar alphabetical order of letters>

Create a hash function for above.

He then asked, another way instead of Hash ?

How to optimize searching among this linked list of heads of other linked lists.

**Round 3: F2F 1 hour**

Only one question – Print leftmost and rightmost node at every level of binary tree.

**Round 4: F2F 1 hour**

Given a string with some ‘?’ where ? can be 0 or 1. Print all possible strings by substituting ? with 0/1.

Eg: I/p Amaz??n,  
      o/p Amaz00n, Amaz10n, Amaz01n, Amaz11n

Connect all nodes of a binary tree which are at same level.  
 http://www.geeksforgeeks.org/connect-nodes-at-same-level/>  
 <I used level order traversal, with extra variable level>

**Round 5: Telephonic 1.5 hour**

Write a code (online shared collab document) to check whether a tree satisfies children-sum property.  
 http://www.geeksforgeeks.org/check-for-children-sum-property-in-a-binary-tree/>

Write a code (online shared collab document) to convert a given tree to a tree that satisfies children-sum property.  
 http://www.geeksforgeeks.org/convert-an-arbitrary-binary-tree-to-a-tree-that-holds-children-sum-property/>

Some questions related to Operating Systems  
 Major differece between thread and process  
 CPU Scheduling difference between process and threads.  
 Necessary and sufficient conditions for a deadlock Deadlock

Suppose you have a list of 1 billion integers, find 1 million largest integers in this list.  
 List can have repeatative elements, max memory limit is 1 million numbers

Asked to calculate time complexity for my algorithm

**Round 6: F2F 1 hour**

Discussion on current work. You must know what you are working on in detail as you would be grilled

Top 3 features I would put on a website portal if I’m launching a cab service. (Non-technical)

Write code for scheduling algorithms for such a cab services provided you have a list of future bookings, and list of cabs in your fleet.  
 <I was asked to write OOP paradigm code>

**Tips:**  
 Try to interact continuously with interviewer. Keep thinking aloud and keep discussing with interviewers your ideas and approaches  
 Prepare Data structures, in particular binary tree very thoroughly.

Hope this helps. 

If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-165-sde-2/>

# Amazon Interview Experience | Set 166 (For SDE I)

**Telephonic 1:-**

1. Light is falling on a tree from left side you have to find all the nodes on which this light will fall.

2. Check whether a link list is palindrome or not.

3. Minimum Edit Distance.

**Telephonic 2:-**

1. ZigZag traversal of tree

2. Pair wise elements which sum to a given value

3. Intersection point of two linklists

**F2F round 1:-**

1. Maximum in sliding window

**F2F round 2:-**

1. You have a list of program files, how will you decide which file to compile first and which later, what data structure you will use for storing these dependencies.

2. Best Fit

3. You have been given time intervals of a you tube video watched mostly. You have to find out the most watched time interval, so that you can put an ad in between that section.

**F2F round 3:-**

1. Find a number in an infinite stream of sorted numbers.

2. What happens when a computer starts?

3. Write a hashing function for storing stream of words.

**F2F round 4:-**

1. A lot about my projects, what is the best thing you have done so far.

2. Populate sibling pointers in a tree.

3. TCP/IP, http/https, how to establish a secure connection or send an encrypted data, PPP protocol.

4. Virtual memory.

Thanks a lot geeksforgeeks for helping me a lot in my interview preparation.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-166-sde/>

# Amazon Interview Experience | Set 167 (SDE I for 1 year 6 months experience)

**Round1: Online Coding Round**  
 There were 4 coding question. Was asked to answer 2 out of 4.  
 1) Given a list of N coins, their values (V1, V2, … , VN), and the total sum S. Find the minimum number of coins the sum of which is S (we can use as many coins of one type as we want), or report that it’s not possible to select coins in such a way that they sum up to S.  
 Example: Given coins with values 1, 3, and 5.  
 And the sum S is 11.  
 Output: 3, 2 coins of 3 and 1 coin of 5.

2) Given two rectangles, find if the given two rectangles overlap or not

3) Given two strings string1 and string2, find the smallest substring in string1 containing all characters of string2 efficiently.  
 For Example:  
 Input string1: “this is a test string”  
 Input string2: “tist”  
 Output string: “t stri”

4) I don’t remember the question.

**Round 2: F2F Technical (Hyd)**  
 1) Print zig zag of tree

2) Longest Palindromic subsequence of a given string.  
 Was asked to write complete code.

**Round3: F2F Technical (hyd)**  
 1) Lots of Question on my projects.  
 Since my project relates to multiprocessing, lots of questions were asked why multiprocessing/why not multithreading, difference, what is thread/process, producer consumer problem, etc.

2) Design a file structure in Linux.

3) I was asked to write flawless code for inserting an element in sorted linked list which should cover all corner cases.

**Round3: F2F Technical (hyd)**  
 1) Given an array of words, print all anagrams together.

2) You have an array which the ith value is the price of a given stock on day. You can buy only one share of the stock and sell one. Design an algo to find the best times to buy and sell. Also he asked me to give start date and end date.

3) Graph problem:  
 Critical node: If a node reaches another node only through one node.  
 Eg: A-C-B and A-E-B are critical nodes. (A reach B through one node which is C or E)  
 If A reaches B through more than one node, then they are not critical nodes.  
 1) A-C-B  
 A-D-E-B (A reach B thro c which might lead to critical node but A has another path to B thro D and E, so they are not critical nodes).  
 2) X-Y-Z  
 X-A-Z (X and Z are critical nodes)  
 Now find all critical nodes.

**Round4: F2F Technical (hyd)**  
 1) Many questions on my projects. He asked me to write pseudo code for one of my project.

2) Outlook:  
 A server receives meeting objects from multiple senders. Meeting object contains meeting time, sent time, recipient(s), sender id,etc. When recipient comes and checks the server, he/she should get requests based on meeting time and not based on sent time. Many discussions on space complexity and time complexity.  
 Eg:

12 PM From: A To: B,C,D meeting time: 4 PM meeting Id: 1  
12.30 PM from: A To C,D meeting time : 2 PM meeting Id:2  
1:PM From B To: C meeting time: 1.30PM meeting Id:3

When C requests the server, C should get ID3 as 1st, ID2 as 2nd and ID1 as 3rd meeting.

3) Many behavioural questions.

I would like to thank geeksforgeeks for helping me to crack the interview.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-167-sde-1-year-6-months-experience/>

# Amazon Interview Experience | Set 168

**Interview 1:**  
 The interviewer asked me about my resume which was followed by the following question.Given a function mapped from integers to real numbers, which strictly increases upto a certain point say A and strictly decreases after it, write a function to find this point.The solution was a simple binary search, the trick being to reach the other side of the peak. This can be achieved iteratively increasing ‘x’ and checking for a downward slope condition. The step could be constant, but an exponential increase would let to the point faster. I was asked to prove this by giving the recurrence relation and hence showing the complexity. I was further asked to code the entire algorithm using any language of my choice where I used c.

**Interview 2**  
 The interviewer asked me about networks in relation to sockets and ports when he saw an academic project that was mentioned in my resume.  
 The interview questions were as follows:  
 1) Given a binary tree where value at each node is a single digit, find the sum of numbers generated by each root to leaf path. He also asked to code the primary function for the same. I couldn’t find the exact question on geeksforgeeks, but this one is close enough <http://www.geeksforgeeks.org/find-the-maximum-sum-path-in-a-binary-tree/>

2) Given a numpad such that every number is associated with a set of letters, give all combinations of strings that could be formed given a string of numbers. He also asked to code the primary function for the same.  
 Solution: <http://www.geeksforgeeks.org/find-possible-words-phone-digits/>

**Interview 3**  
 1) Given an array of integers, find a subset of numbers from this array such that, after negating the elements of this set, the total sum of all elements would be equal to zero.  
 I could not solve the problem and he moved on to the next one after giving me a hint to use Dynamic Programming

2) Given two sorted arrays find the median of the merged array without using extra space. I gave an O(N) Solution and he asked me to give an O(log(N)) solution,which I gave after I put in some thought

3) Print a binary tree in a zigzag order level wise. I gave an implementation using a doubly ended queue, he wasn’t satisfied as this would lead to extra space complexity for storing the levels in the d-queue. He was pleased when I decided to use 2 queues for the same. He further asked me to code it up

**Interview 4**  
 1) The interviewer asked me about the types of database I knew and elaborated a bit on non-relational databases like mongodb and JSON.

2) Next, he asked me the need for indexing in databases and it’s implementation.

3) In an auctioning system, the bidder with the highest bid wins but charged at kth highest price. Develop a system for it. Solved it using a hashmap. Was asked to write a code for the same.

4) Given an array such that all elements except one are duplicate, find this element. Solution: <http://www.geeksforgeeks.org/forums/topic/finding-non-duplicate-element-from-array/> He tweeked the problem to add the condition that in stead of one there are 2 such elements. I couldn’t arrive to a solution even after he gave me some hints. In the end he gave me the answer but immediately said that it may not work. I realized why it did work and explained the reason for the same.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-168/>

# Amazon Interview Experience | Set 169 (For SDE 2)

Recently I was interviewed for the position of SDE 2 I have 4 years of work experience .Following were the asked.

Note: For all of the question production level code was required.

**Round 1:**  
 1.Write a program to convert a integer to its form in a given language .  
 For example 112345 Could be one hundred twelve thousand three hundred forty five or One lac twelve thousand three hundred forty five.

2.Find the top k frequent items in a stream of numbers Space O(k)

**Round 2:**  
 It was basically a design round .  
 1.Design a Chess board so that two players can play.Each of the play can make any warrior move.Class Diagram and basic functions were asked to be written.

2.Design a key value pair storing system in a distributed system  
 Questions on types of caching in distributed systems , Sharding  
 How will you be handling scalability , failover and latency.

**Round 3:**  
 Given a 2 D array with m Entry points (which are on the edges) and n exit points which are on the edges give the total number of paths that are possible .Complete production level code was to be written

**Round 4: Bar Raiser Round**  
 1.given a large file with contents like  
 1.CAT  
 2.DOG  
 3.TAC  
 4.ACT  
 5.GOD  
 6.ODG  
 Re-arrange it such that every line has the index of all of its anagrams  
 Eg Output  
 1.CAT 1,3,4  
 2.DOG 2,5,6  
 3.TAC 1,3,4  
 4.ACT 1,3,4  
 5.GOD 2,5,6  
 6.ODG 2,5,6

2. Given inorder and postorder traversal of a tree give the preorder traversal without creating the tree.

**Round 5 Hiring Manager Round**

1.Nut and Bolts Problem  
 2.Given a million list of co-ordinates in the form of longitude and latitude just as Google maps .How will you print closest k cities to a given location .

After that a few behavioural questions  
 I was not able to come up with a good answer for second question.

I thank geeksforgeeks for creating this amazing platform.Great job guys.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-169-sde-2/>

# Amazon Interview Experience | Set 170

**Round 1 – Telephonic**

1. Find element in an array which have elements in first increasing and then decreasing order. (code)

2. Find if two nodes in a tree are cousins or not. (code)

**Round 2**

1. Find sum of all numbers that are formed from root to leaf path (code) expected time complexity O(n)

2. Zig-Zag level order traversal.

3. Preorder traversal without using recursion.

Other questions related to my work in my current company

**Round 3**

1. Grilled me about my current company and current work.

2. Print top view of a binary tree (code)

3. Why amazon?

**Round 4**

1. Find median of an unsorted array. (code)

2. General discussion on heaps

3. A stream of characters is coming, at any moment you have to tell ‘k’ elements closest to a given number (code)

**Round 5 (Bar raiser)**

1. Design a system which would make a schedule for a user to complete a book in given number of days. A pre condition is that the schedule for every day should end at the end of some chapter.

Ex – 3 chapter with 10 pages each and user has to complete this book in 2 days, then the schedule should be either be 2 chapters on first day and 1 chapter on second or 1 chapter on first day and 2 chapters on second. (code)

2. Tell me about a time when you couldn’t implement the best solution because of a close deadline.

3. What did you do about it afterwards.

4. General design pattern related questions like what if we use singleton design pattern for question 1

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-170/>

# Amazon Interview Experience | Set 171

Hi, I recently got an offer from Amazon, here is my interview experience:

**Round-1: (Written)**

Q-1: Search element in infinite sorted array.

Q-2: Fine LCA (lowest common ancestor) of given two nodes in Binary Tree. Handle all corner cases like one element exists and other not. <http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>

Q-3: Find next greater number with same digits. Handle corner cases. <http://www.geeksforgeeks.org/find-next-greater-number-set-digits/>

**Round-2: (F2F)**  
 Q-1 : <http://www.geeksforgeeks.org/median-of-stream-of-integers-running-integers/>

Discussed corner cases. Proper code was required.

Q-2 : <http://www.geeksforgeeks.org/clone-binary-tree-random-pointers/>

Discussed different approaches. Proper code was required.

**Round -3 (F2F)**

Q-1: <http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem/>

I don’t have Idea about problem initially then he asked to make some test cases, some tricky one. I gave recursive algorithm then, after this came on DP solution but time doesn’t permit so moved to second question. Code was required.

Q-2: Given inference rules and some input tokens find all tokens which can be possible with given rules. Example :

Rules :  
 AàB  
 BàD  
 CàE  
 DàF

Input Tokens :  
 1. A,C then all A,B,C,D,E,F are possible.  
 2. A then A,B,D,F are possible.  
 Ask me what data structure you will use, how processing will happen. Pseudo code was required.

**Round -4 (F2F)**  
 Long discussion on my current work. Biggest challenge and how you solve it. Technology challenge.

Q-1: Suppose you receive 10 million mails in 10 seconds. How will you process them and find whatis problem to receive these many mails. Discussed different approaches.

Q-2: longest palindromic substring of given string. I gave DP solution, he ask me don’t use DP. Proper code was required.

<http://www.geeksforgeeks.org/longest-palindrome-substring-set-1/>

**Round-5 ( Telephonic)**

Long discussion on my current work again, Challenges faced. What you did when some mess-up happens and deadline is very strict. Conflict with manager.

Q-1 : Outlook:  
 A server receives meeting objects from multiple senders. Meeting object contains meeting time, sent time, recipient(s), sender id,etc. When recipient comes and checks the server, he/she should get requests based on meeting time and not based on sent time. Many discussions on space complexity and time complexity.  
 Eg:

12 PM From: A To: B,C,D meeting time: 4 PM meeting Id: 1  
  
12.30 PM from: A To C,D meeting time : 2 PM meeting Id:2  
  
1:PM From B To: C meeting time: 1.30PM meeting Id:3

When C requests the server, C should get ID3 as 1st, ID2 as 2nd and ID1 as 3rd meeting.

Q-2 : <http://www.geeksforgeeks.org/add-greater-values-every-node-given-bst/>

I gave solution using temp array, then he ask me to do in constant space in single traversal. Condition don’t use pointer for sum or call me reference. Proper code was required.

**Tips:** Be yourself . Practice writing code on paper. Never give up.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-171/>

# Amazon Interview Experience | Set 173 (On-Campus)

Recently I appeared for Oncampus Amazon Interviews for SDE position and here is my experience.

**Round 1: 1.30 hour Online Written Test**

It had 20 MCQ questions on C/C++ and 2 coding questions. The coding questions were:

Q1. You are given a string that represent an expression of digits and operands. Eg. 1+2\*3 , 1-2+4. You need to evaluate the string or the expression. NO BODMAS is followed. If the expression is of incorrect syntax return -1.  
 Test cases :  
 a) 1+2\*3 will be evaluated to 9.  
 b) 4-2+6\*3 will be evaluated to 24.  
 c) 1++2 will be evaluated to -1(INVALID).  
 Also, in the string spaces can occur. For that case we need to ignore the spaces. Like :- 1\*2 -1 is equals to 1.

Q2. You are given an array of both negative and positive integers. You need to rearrange the array such that positive and negative numbers alternate. Also, the order should be same as previous array and only O(1) auxiliary space can be used and time complexity O(n).  
 eg. -2 3 4 5 -1 -6 7 9 1  
 result – 3 -2 4 -1 5 -6 7 9 1.

**Round 2:**

Q1. Given a Linked list , print yes if it is palindrome else print no.

Q2. Print the level order traversal of the binary tree in the spiral form.

**Round 3(F2F):**

Discussion about project.  
 Some question on DBMS, OS.

Q1: Maximum of all subarrays of size k(Expected Time Complexity O(N).  
 Input :  
 arr[] = {1, 2, 3, 1, 4, 5, 2, 3, 6}  
 k = 3  
 Output :  
 3 3 4 5 5 5 6

Q2: Given Two sorted array of size size n each. Find the Kth largest element in these two array (Expected Time Complexity Log(n))

**Round 4(F2F)**

Detail Discussion about project

Q1.website having several web-pages. And also there are lot many user who are accessing the web-site.  
 say user 1 has access pattern : x->y->z->a->b->c->d->e->f  
 user 2 has access pattern : z->a->b->c->d  
 user 3 has access pattern : y->z->a->b->c->d  
 user 4 has access pattern : a->b->c->d  
 and list goes on for lot many users which are finite and numbered.  
 Now the question is we have to determine the top 3 most occurring k-Page-sequence.  
 for the above example result will be : (k=3) a->b->c , b->c->d , z->a->b.

Q2: Given two array , one of size m+n and contains m element and other position are empty , 2nd array is of size n and contains n element.  
 both array are sorted , now merge the second array to first one such that the resultant array is sorted. Expexte time complexity(m+n).

I would like to thanks geeksforgeeks for providing such a platform to learn algorithm and data structures…  

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-173-campus/>

# Amazon Interview Experience | Set 174 (For SDE)

Recently I went through Interviews for SDE position in Amazon Development Centre, Chennai. Here is my Interview experience:

**Telephonic round:**  
 1) Given an array with lengths, you have to select 3 lengths (a, b and c) for a triangle such that it satisfies condition a+b>c,b+c>a, a+c>b. Find the number of possible triangles can be created from the given array.  
 ex: 3 5 6 9 10  
 (3,9,10), (3 5 6), (5 6 10), (5 9 10), (5 6 9), (6 9 10)  
 so number of possible triangles is 6

2) Count Inversions in an array  
 Inversion Count for an array indicates – how far (or close) the array is from being sorted. If array is already sorted then inversion count is 0. If array is sorted in reverse order that inversion count is the maximum.  
 Formally speaking, two elements a[i] and a[j] form an inversion if a[i] > a[j] and i Example:  
 The sequence 2, 4, 1, 3, 5 has three inversions (2, 1), (4, 1), (4, 3).

**In house Interview 1(F2F):**  
 3)Next Greater Element  
 Given an array, print the Next Greater Element (NGE) for every element. The Next greater Element for an element x is the first greater element on the right side of x in array. Elements for which no greater element exist, consider next greater element as -1.  
 Examples:  
 a) For any array, rightmost element always has next greater element as -1.  
 b) For an array which is sorted in decreasing order, all elements have next greater element as -1.  
 c) For the input array [4, 5, 2, 25}, the next greater elements for each element are as follows.

Element NGE  
 4 --> 5  
 5 --> 25  
 2 --> 25  
 25 --> -1

d) For the input array [13, 7, 6, 12}, the next greater elements for each element are as follows.

Element NGE  
 13 --> -1  
 7 --> 12  
 6 --> 12  
 12 --> -1

4)Sorted Array to Balanced BST  
 Given a sorted array. Write a function that creates a Balanced Binary Search Tree using array elements.  
 Examples:

Input: Array {1, 2, 3}  
Output: A Balanced BST  
 2  
 / \  
 1 3  
  
Input: Array {1, 2, 3, 4}  
Output: A Balanced BST  
 3  
 / \  
 2 4  
 /  
1

**Inhouse Interview 2(F2F):**  
 5) Detect Cycle in a Directed Graph  
 Given a directed graph, check whether the graph contains a cycle or not. Your function should return true if the given graph contains at least one cycle, else return false. For example, the following graph contains three cycles 0->2->0, 0->1->2->0 and 3->3, so your function must return true.

6) Convert a BST to a sorted circular doubly-linked list in-place.

**Telephonic Round with Hiring Manager:**  
 Introduction about me.  
 Then he asked about my college project. we discussed the OO design for the project.  
 Then he asked me about my current company’s latest Invention  
 Then he asked me about Virtual memory and some in depth discusion on that.  
 Then he came to my current project I am working  
 Then he asked me why are you coming out of my current company??  
 Then he gave a question to solve.  
 7)Given an array A[] and a number x, check for pair in A[] with sum as x  
 Given an array A[] of n numbers and another number x, determines whether or not there exist two elements in S whose sum is exactly x.  
 He asked about various possible solutions for the above one.

**Bar raiser round(F2F):**  
 8)Given a binary tree, find the diameter of the tree.  
 The diameter of a tree (sometimes called the width) is the number of nodes on the longest path between two leaves in the tree.

After solving the above one, he added a constraint on the above problem: (i.e) To find the diameter of the tree with atmost one turn  
 Examples of turns in tree:  
 In tree1-> start from 1 and there is a turn at root 2 towards right,  
 In tree2-> starts from 3 goes in left and there is a turn at 1 towards right ,  
 In tree3-> starts from 1 goes in right and there is a turn at 3 towards left,

2 3 1  
 / \ / \  
 1 3 1 3  
 \ /  
 2 2

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-174-sde/>

# Amazon Interview Experience | Set 175 (For SDE)

Here’s my interview experience for Amazon, Bangalore for SDE

**Round 1 (F2F)**

Q1.) Given a function rev(int i) which reverses the segment of array ar[] from 0-i, Implement a function sort() using rev().

Q2.) Given an array ar[] of length ‘n’ and an integer ‘k’ such that k

**Round 2 (F2F)**

Q1.) (Variant of Children-Sum Problem)  
 Given a tree, implement a function which replaces a node’s value with the sum of all its childrens’ value, considering only those children whose value is less than than the main node’s value.  
 Eg: input = 60->50->80->40 , output = 90->40->40->0

Q2.) There are millions of string in the database. How would you store them for efficient searching. You also need to print all anagrams together many times, now how would you store them and insert if a new string is added to database ?

**Round 3 (F2F – Hiring Manager Round)**

\* Why are you leaving the company so early ?  
 \* Discussions on project and current work in the previous company.  
 \* Discussion on college projects.

\* Design a game ‘fifteen’ – <http://en.wikipedia.org/wiki/15_puzzle>  
 Game me to write code of various moves, discussed optimization strategies and time-complexity if computer is given to solve it.

\* Behavioral questions.

**Round 4 (Telephonic)**

Q1.) Most challenging problem faced (obviously in projects), how you solved it.

Q2.) Discussion on Design patterns.

Q3.) Design Uber – [http://en.wikipedia.org/wiki/Uber\_(company)](http://en.wikipedia.org/wiki/Uber_%28company%29)  
 He was trying to judge what all aspects the person considers  
 Classes, Objects, search and booking cab algorithms, implementation and technology

Q4.) Extension of previous question – Write code to search nearest 10 cabs.

Code is required in all questions. Practice code on paper.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-175-sde/>

# Amazon Interview Experience | Set 176 (For SDE 1)

**Telephonic Round 1:**  
 1) You are given an integer array. Create a Binary Search Tree from it.   
 2) You are given a Binary Search Tree. Write an algorithm to print the Path Array of a given key.  
 PATH ARRAY:  
 a) If the given key is not present in the tree than the Path Array is equal to “-1”  
 b) If the given key is present in the BST, path array tells you the path (in terms of left & right direction) that you take from root to reach the given key. If you go towards right add “0” to the path array and if you go towards left add “1” to Path Array.

**Telephonic Round 2:**  
 1) You are given an array as an input. The array is organized in such a way that its element are arranged in increasing order up till a certain index and in decreasing order after that. Write an algorithm to search an element in such a array.  
 <http://www.geeksforgeeks.org/search-an-element-in-a-sorted-and-pivoted-array/>

**Face To Face 1:**  
 1) You are given two array of “n” length. First array contains the arrival time of various trains on a particular station. Second array contains the departure time of those trains. Write an algorithm to find out the minimum number of platforms that will be required to accommodate all the trains.  
 <http://www.geeksforgeeks.org/minimum-number-platforms-required-railwaybus-station/>  
 2) You are given a binary tree. A light source is placed on the right of the tree. Print the list of all the nodes over which the light is falling directly.

**Face To Face 2:**  
 1) A new feature is to be implemented in Kindle. FEATURE : The user inputs the no. of days in which he would like to complete a particular book and the Kindle will create a reading plan for the user.  
 Write an algorithm which will output the reading plan to the user. The reading plan should be created keeping in mind that the user would like to begin and end reading a particular “chapter” of the book on the same day.  
 2) Some general questions:  
 a) Tell a project where you had faced tight deadlines and you had to skip a few things.  
 b) How did you decide, which things should be skipped?  
 c) If given a chance to implement the same project again, how will you implement it?  
 I gave all the answers with respect to a college project.

**Face To Face 3:**  
 1) A very brief discussion of what my current responsibilities are. It was a 5-10 minutes discussion only. I feel that the discussion was brief as my experience was just a little over 1 year.  
 2) Given a binary tree write an algorithm for spiral traversal of the tree.  
 <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>  
 3) You have N documents, where N is very large. Each document has a set of words lets say w1,w2..wm where m might differ for each document. Now you are given a list to K words lets say q1,q2…qk.  
 Write an algorithm to print the list of document which have the K words in them.

This question required a number of hints. I finally came up with the solution of creating a combined trie for all the documents. After listening to my solution he said that it was good but could have been better with B-Tree. I told that as of now I am not able to memorize the concept of B-Tree and he said he was satisfied with the trie solution that I had given.

**Face To Face 4:**  
 1)  
 a) What are various types of tree traversals and diff between them?  
 b) Which of the traversals would you require for creating the tree (unique) back?  
 2) You have a very large array, but the array can contain only three elements: 0,1& 2. Write an algorithm to sort the array.  
 Count Sort was one option, but it didn’t strike to me at that point of time. So I came up with a trivial algorithm which sorts by putting all the 2’s to the right and all the 0’s to the left, 1’s get sorted by themselves.

For all the questions in all the interviews I was asked for the time complexity of the problems. However they didn’t expected me to do some calculation and then come up with a very tight bound solution. They just wanted a rough estimate of the time complexity of the solutions.

Allocated time for all the interviews was 1 hour.

I would like to thank GeeksForGeeks for helping me with the preparations.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-176-sde-1/>

# Amazon Interview Experience | Set 177 (First Round in Pool Campus)

Today Amazon Took a Pool campus drive, including our college and many other. In which the First round was Online in our campus itself, those selected students would go for further rounds in other campus.

The First Round Was very Standard, first we had to open its Hiring test portal, in which it had 20 MCQ and 2 coding questions, which we had to complete in 1:30 Hrs.  
 MCQ:

* It had question from OS, DBMS, Algorithm, Infix, postfix
* OS basically from scheduling, and process management in UNIX
* DBMS questions some simple query in my SQL
* questions asking Complexity of some give Algo. number of swaps in Bubble sort, best technique to sort partial sorted list etc
* finding output of prefix expression, given Postfix finding prefix of BST etc
* full form of LDAP, qustions including privileges of User, kernel in UNIX etc

Coding:  
 1: given 3 Numbers in Linked list, we had to return the Linked List of representing sum of all three, covering all base and condition of addition.

eg: for addition of  
 234+993+1 :  
 input Linked Lists are: 4->3->2->NULL, 3->9->NULL, 1->NULL  
 output linked list : 8->2->2->1->NULL

2: Simple and same Vertical traversal of a BST as given in Geeksforgeeks.org

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-177-first-round-pool-campus/>

# Amazon Interview Experience | Set 178 (For SDE-1)

In-house interview with Amazon Bangalore for SDE 1. Here’s my experience.

**Round 1:**  
 My first round was the HM round because no other panel members were free.  
 1. Lots of questions my current project. Why I am looking for a job change.  
 2. Write a calculator web application just like the one that comes with MS windows.  
        Trick was to evaluate the expression according to the BODMAS  
        Lots of dicussion on different approach using 2 stacks, arrays, lists, Tree  
        with and without postfix conversion.  
        Asked to explain all the approach on the White Board.

**Round 2:**  
 1. Link all the level order nodes to makes a linked list with the first node of each level acting as the root of that linklist.

10  
 / \  
 6 17  
 / / \  
 4 14 19   
So the Linklist will be  
 10->null  
 6->17->null  
 4->14->19->null

Gave the answer using the 2 queue. (Level order transversal) with alternate queue for the alternate level  
 Than interviewer asked to solve the problem without using any other data structure (No stack or queue)

2. Question on Baggage claim token generations.  
        You have three containers, small, medium and large. Passenger comes in, checkin the luggage. You have to store the baggage in the appropriate container and generate a unique token number. Then passenger should get back the bag using the same token number. Trick was if small container is full store in medium if available or large. Now if the large bag comes in and there is now a empty space in small, than move the small bag back to small & store the large bag. How to generate the unique token number and move the baagage internally without changing the token number?  
        Lookup should be in constant time complexity and insertion in minimum complexity.  
        It looks easy but kind of tricky if you start solving because token number shouldn’t get changed if you move the baggage internally and space should not get wasted in the memory if baggage is removed.

**Round 3:**  
 1. Find the size of the smallest substring in a given string that contains all the characters in given set in any order.

Ex:   
 INPUT:  
 String: "abfugtabecddcca"  
 Character Set: a,b,c   
 Output: 4 ("abec")

2. Convert a sorted doubly linklist into Binary search tree (Inplace)

**Round 4(Bar Raiser Round):**  
 1. Again Lots of questions on current project. My contributions.  
        Most complicated problem I have ever encountered in my recent project and how I solved it.  
        Subject I liked the most in the college and why and what I learnt from it.  
        In my previous rounds, which question I found the most difficult one and why?  
        If I will be given a chance to change any of the my answers to the questions asked in previous round, what question it will be and why?  
        Was I satisfied with my interview.

Technical question:  
 Do a spiral transversal of a 2D matrix

Ex:  
 a b c d  
 l m n e  
 k p o f  
 j i h g  
   
 output: a b c d e f g h i j k l m n o p  
   
 Both iterative and recursive approach.   
 Lots of discussion on Complexity.

Thank you geeksforgeeks for providing the awesome platform for preparation.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-178-sde-1/>

# Amazon Interview Experience | Set 179 (For SDE-1)

**Telephonic**

1) Given an array which has elements in increasing order first , and then decreasing, suggest an algorithm for searching an element in it.

2) Check whether a given tree is a BST or not.

3) do not remember

**F2F 1**

1) Number of hops required to reach the end of an array , where the maximum hop is the value at index.  
 Tweaked question after this, to reach any node.

2) print the path between any two given nodes in a binary tree

**F2F2**  
 1) Project and resume discussion.  
 Problems faced and how you approached them.

2) A large number of emails coming into the system, at any given time find the top k issues being faced by the users. Problem reduced to find the top k trending words in a large file.

3) Implement a vector in c, using any available data structure

**F2F3**

1) Given a pre-order traversal of a binary tree represented by , I for internal node and L for leaf, build the tree.

2) Find the next smallest element for all the elements in a given array.

**F2F4**

Started off with a lengthy discussion on current project, was asked to draw a schematic of the same, and then was asked to discuss my roles and responsibilities as well as suggest what improvements could be made to it.

1) Given a 2-D array, in which all the elements are either 0’s or 1’s, and all the rows are sorted, Give an algorithm for finding the row having the maximum number of 1’s. Was asked to code and analyse time complexity as well.

2) There is a given set of colours , say [1-N]. Now , people are coming into a stadium wearing t-shirts of any of these colors. Write an algorithm to find the first person to come in, to have worn an unique color.  
 The question wasn’t clear to me at first, so after a few examples , got what he was trying to ask.  
 For eg. Suppose we have colors R G B  
 and the stream of people are as,  
 G R B G G G G  
 the output should be R.

Hope this helps some people.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-179-for-sde-1/>

# Amazon Interview Experience | Set 180 (Telephonic Interview )

I had a telephonic interview. It was of 90 minutes.

Questions asked by me.

1. Tell me about yourself.  
 2. What was your college project as well as what type of platforms used?  
 3. What is TRIE?  
 4. Write the function for insert and search for TRIE?  
 5. DFS and BFS .  
 6. How to get the shortest path from (0 , 0) to (r , c) in a rectangular grid in which some cells are blocked.

Overall awesome telephonic interview.

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<http://www.geeksforgeeks.org/amazon-interview-experience-set-180-telephonic-interview/>

# Amazon Interview Experience | Set 181 (For SDE 1)

Recently I was interviewed by Amazon for SDE 1, here is my Experience. Hope this will help others:

**Written Round :**  
 there where 3 coding question , out of which 2 where DS related and 3 rd one was Problem solving  
 1. Count no of words in given string .  
 2. Find first non repeating character in a stream of characters  
 3. related to slot machine and its working

Interviews  
 **F2F 1.**  
 1. firstly some non technical questions where there , such as  
      tell me about yourself ,  
      Why Amazon etc  
 2. followed by 2 coding questions  
      1. Given a sorted dictionary of alien language , find order of characters.  
      2. find minimum number of characters needed to be added to the end of a string to make it palindrome.

**F2F 2.**  
 was a senior guy ,  
 1.started with discussion on previous interview questions , as I had used DP in second question so a brief discussion on DP , tried to test me that does I really know the concept of DP.  
 2. asked few puzzles , One should be prepared for some out of box questions as they want to check the thought process . even they change puzzles and try to get different solutions. Think loud always.

**F2F 3.**  
 was also a senior guy,  
 1. Started with general induction and asked about till then my interview experience and related stuff.  
 2. Simple Matrix multiplication problem ,with only 2 double pointer are given , we need to check sizes of both matrix , multiplication feasibility and then do multiplication .  
 3. Design Question from DataBase point of view , asked about table structure for the problem and had a good discussion on it , concept such as normalisation was discussed .

**Telephonic 4th**  
 He was a very senior guy from different team ,  
 1. Started with general introduction followed by many Behavioural hr questions .  
 2. Followed by Design Question, a feature of Outlook  
 A Server receives meeting objects from multiple senders. Meeting object contains meeting time, sent time, recipient(s), sender id,etc. When recipient comes and checks the server, he/she should get requests based on meeting time and not based on sent time. Many discussions on space complexity and time complexity.?Eg:

12 PM From: A To: B,C,D meeting time: 4 PM meeting Id: 1

12.30 PM from: A To C,D meeting time : 2 PM meeting Id:2

1:PM From B To: C meeting time: 1.30PM meeting Id:3

When C requests the server, C should get ID3 as 1st, ID2 as 2nd and ID1 as 3rd meeting.

**Small set of Suggestions :**  
 1. Practice writing code using pen and paper .  
 2. Try to be interactive as they are very much interested in candidate’s thought process , think loud , be confident .  
 3. Firstly explain the logic and when interviewer is satisfied then start coding .  
 4. Have few questions prepared for the interviewer as it shows interest of candidate towards the company .Do proper home work about the company.

Thanks GeeksforGeeks for such a great content , Keep doing the great work 

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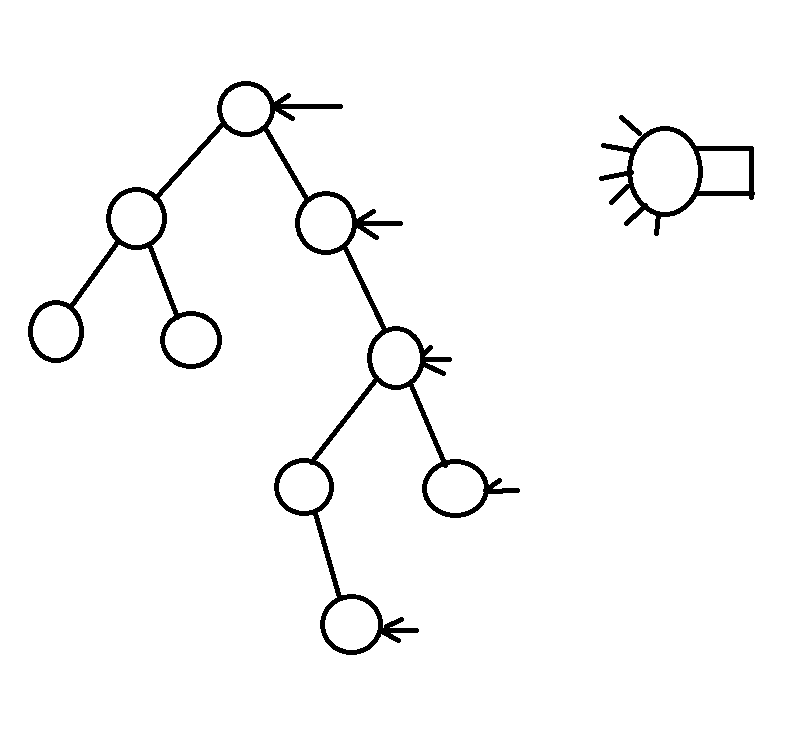
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<http://www.geeksforgeeks.org/amazon-interview-experience-set-181-for-sde-1/>

# Amazon Interview Experience | Set 182 (For SDET 1)

**Round 1: (Written Test)**  
 1. Given a sorted array construct a Balanced Binary Search Tree.  
 2. Given a linked list, find whether linked list is palindrome or not without using any extra space.  
 3. Given set of strings find longest common prefix. If no common prefix present print null  
 Example: {abcd, abbd, abdy, az}  
 Answer: a

**Round 2: (F2F – Problem Solving)**  
 1. Given sorted array of unique elements. Find an element which is having value equal to its index.  
 {-4,-2,2,4,6,9}  
 Ans: 2  
 2. Given a brick of size 1 x 4, how many ways you can construct a wall of size N x 4

**Round 3: (F2F – Data structures and Algorithms)**  
 1. Give a binary tree, print all the nodes in spiral order with constant space  
 2. Give a binary tree and a light source fixed placed right side of the tree. Print all the nodes where the light directly falls.  
 [](http://www.geeksforgeeks.org/amazon-interview-experience-set-182-for-sdet-1/treelightsourceproblem/)  
 3. Merge two sorted linked lists without using extra space

**Round 4: (Telephonic – Hiring Manager from Seatle – All Questions on Testing and Projects)**  
 1. Tell me about yourself  
 2. Roles and responsibilities of your current role  
 3. How do you test a search box  
 4. Did you ever have a fight with developer over a defect? If you had how did you solved ?  
 5. Few behavioral questions

**Round 5: (F2F – Test Automation and Testing)**  
 1. Design an automation framework  
 2. Given a function InsertNode() which inserts a node to a linked list. Write all scenario’s to test the function.

**Round 6: (F2F –Bar Raiser)**  
 1. Tell me about yourself  
 2. Why Amazon  
 3. Hardest bug you found  
 4. Given an array of integers. Write a program to find interval with largest producing maximum sum. You should print sum as well as first and last index of the interval.  
 5. Your strengths  
 6. Your weakness

**Useful sources for Technical Preparation:**  
 1. GeeksForGeeks  
 2. Data Structures and Algorithms Made Easy by NarasimhaKarumanchi  
 3. Data Strucutures videos by Prof Naveen Garg from IIT Delhi

Use Cracking the Coding Interview book by McDowell Lakmen for behavioral as well as technical questions.

**Tips:**  
 1. Think loud in front of interviewer.  
 2. Never keep quiet during interview  
 3. Prepare well on the projects which you are currently working on.  
 4. Be honest in behavioral questions  
 The beautiful part of the entire interview process was in none of the interviewer looked at my resume.

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# Amazon Interview Experience | Set 183 (SDE - New Grad Position)

Following is my experience. I hope it helps people out there, as I got help from other posts here before my interview.

Duration: 4 hours

**interviewer #1: 8 am – 9 am**

Q1) tell me your interest  
 -> Big Data  
 Q2) what’s latest thing you follow in it  
 -> Apache Spark  
 Q3) What is it and explain  
 -> told the standard MapRed and Hadoop vs Spark  
 Q4) what more features  
 -> told graph processing and MLLIB  
 Q5) Actual question starts here, given the binary tree, how will you serialize and deserialize it to the file?  
 ->  
 answer1: Serialize => do in-order traversal and pre-order traversal and write it to a file  
                Deserialize => build the binary tree using pre-order and in-order traversal  
      he was not satisfied, gave me hint of no need to do complex in-order, pre-order thing

answer2: BFS clicked me, told him to do BFS and write to a file level wise  
              But he found a bug in deserialize method, I changed the serialize method for null values to speial character in file

he was okay with it, and asked me to write a code for it  
 asked the complexity  
 told him, was not convinced wholly, then finally told him, was still not  
 left the room with think over it 

**interviewer #2: 9am – 10 am**  
 Q1) bang on target, given 2 timeframes, check if they overlap  
 -> s1, e1, s2, e2  
    ep1 = epoch(s1),  
    ep2  
    ep3  
    ep4

   if ep1      return T  
    return F

Q2) LCA in doubly binary tree !!!  
 -> I frowned, what is doubly binary tree!!  
    it’s just every node has access to the parent

but you need to find the LCA and you do not have access to root of tree!  
 some brainstorm, and I got it  
 what is time complexity:  
 worst case: O(n^2) in skewed tree  
 average case: was not sure, gave me hint, and I told him, was okay

told him the 1st way, was convinced but hinted me the better way  
 Got his hint, and gave the answer, was satisfied

Q3) given 2 strings, how would you find if they are anagrams of each other  
 -> solution 1: 2 hash ( was okay but asked the better way)

hinted me that no of characters are limited  
 solution 2: told him the way of count sort, i.e. use 2 count sort arrays  
 but he said no need of other array, you can do in single array

told him the way, was satisfied

**Interviewer #3:**  
 – started with his long intro  
 – asked mine, and then stopped me as I was talking at length  
 – asked me amour my search project  
 – asked me the basic design  
 – how did you deal with data when you cannot fit in memory  
 – how did you do intersection of posting lists  
 – what is time complexity

then asked me to design the chase game  
 stumbled like hell, i guess this is going to be my rejection factor

**Interviewer #4: (manager) behavioral round**  
 – gave his long intro  
 – asked about myself  
 – when did you feel that something could have been done in better way after delivering it in project  
 – when did you perform best way, as in what did you come up with that other could not do  
 – when did you go out of the way i.e. against your managers, or higher authority and deliver the best according to you

– asked the system architecture question: design the TINYURL system in terms of server architecture i.e. HA, scalability and request processing

– was satisfied, and left with good note.

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