

# Interview-Corner Archive

## Amazon Interview experience | Set 328 (For SDE-1)

Started with online test at Hackerearth. It had 2 questions.

1. Find subarray with max sum. Array have both -ve and +ve integers.

2. Consider a matrix with rows and columns, where each cell contains either a 0 or a 1 and any cell containing a 1 is called a filled cell. Two cells are said to be connected if they are adjacent to each other horizontally, vertically, or diagonally;

If one or more filled cells are also connected, they form a region.

Output the length of the largest region.

Ex: in the following example, there are 2 regions one with length 1 and the other as 6.

```
0 0 1 1 0  
1 0 1 1 0  
0 1 0 0 0  
0 0 0 0 1
```

### 1st Round (telephonic)

1. Given a string and integer k, in-place rearrange the string such that last n-k characters comes before the first k characters.

Ex: abcdef and k=3, so result is : defabc

2. Given a binary tree, sum all the root to leaf nodes and return the sum.

**Ex:**

```
1  
/ \  
2 3  
/ \ \\  
4 6 7
```

here ans: 124 + 126 + 137 = 387

### 2nd Round

1. Given a large file having strings(for understanding, given an array of strings). Find the string which repeats the most. Ignore the case.

2. Given the link-list and integer value 'k', reverse every k nodes of the list.

Ex. k = 3, list: 1-2-3-4-5-6-7-8

ans: 3-2-1-6-5-4-8-7

### 3rd Round

1. Questions on my projects.

2. Given a binary tree with each node having parent pointers. Find the LCA of two nodes.

### 4th Round

1. Given a 2-D grid, number of steps to take, say k and intial position of a Robot. print the paths possible from initial position after k steps. Robot can move in top, right, left, bottom. In one path, robot can't move to the location it has previously visited.

2. Check if a binary tree is balanced. Balance criteria was difference of height between left and right subtree should be 5th Round

1. Behavioral Questions. Read front pages(before technical stuff) of Cracking the coding interview book. Prepare them well.

2. Given a string, count all the palindromes in that string. Only consider substring palindromes.

Thanks to geeksforgeeks for helping me prepare for interviews.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview experience | Set 327 (Off-Campus for SDE-1)

I was Invited to attend Interview at amazon Hyderabad for the position of SDE 1 and I had the following rounds.

### Round 0 coding —

1. Given an array find the maximum consecutive and non consecutive sum and print them.

2. Given a matrix find the number of 1's in the maximum island  $MAT[i][j] = \{0,1\}$ .

### Round 1 Data Structure —

1. Given a tree return the number of elements for the level with the maximum elements.

PS : all null nodes between two non null nodes need to be counted and null nodes can have null children which also can be counted.

eg– [null,2,1,null,null,3,null] in this level all nodes between 2 and 3 will be counted i.e. 5

2. Asked about what data structures I knew and what data structure will I use to make a cache. the answer was Hashing.

3. Asked what data structure would I use for maintaining cricket scores.

The answer was priority queue.

#### Round 2 Algorithms —

1. Given a binary tree find out if it is a BST

2. Given a binary tree root and a node ,print all nodes at K distance from the node.

3. Given an array it can be of 4 types

(a) Ascending

(b) Descending

(c) Ascending Rotated

(d) Descending Rotated

find out which kind of array it is and return the maximum array.

#### Round 3 Design —

Asked me the word breaking problem which I couldn't solve and this round didn't go well.

#### Round 4 Managerial —

1. Asked about my current company and work done over there.

2. Asked me a problem to convert Integer to Roman while handling all the corner cases.

3. Asked about process and Threads

4. I asked about the team and kind of work to be done

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview experience | Set 326 (For Application Engineer)

Requirement was that the candidates should have strong troubleshooting skills, strong knowledge of scripting in any language + Strong coding skills and problem solving skills.

#### Round 1: Written test (Elimination Round)

There were total 6 questions. 2 coding and 4 scripting questions.

1. Write a function to print the run length encoding of a given string.

Example :

I/P String – wwwwwwxxxxddaaawww

O/P String – w5x4d2a3w2

[5 marks]

2. Write a function to print the spiral of a matrix. [5 marks]

3. The file is given as follows containing records of length 10 having mix of numbers, alphabets and alphanumeric characters.

1234567890

0987654321

ABCDEFGHI

123456789X

1234567890

123456789X

Write a script command to print the distinct records containing only alphanumeric characters.

Expected Output : 123456789X

[2 Marks]

4. Write a script command to rename all .JPG files to .JPEG files in the current directory. [2 Marks]

5. Write a command to kill a process using process name. [2 Marks]

6. Script command to calculate the total size of all the PDF files in the directory. [2 Marks]

#### Round 2 : Technical/Problem Solving F2F Interview

The customary – “Tell me about yourself”.

Then the interviewer asked me whether my code for the run length encoding asked in the written round will run for all the inputs. I was pretty sure that it would run. He gave me a case where my code was failing. He told me to modify my code. Also, I had used Hashing technique for this problem so he asked few questions on

HashMap how it works.

1. How will you find whether any permutation of a word would be a Palindrome.

I explained him the logic using Brute force approach with  $O(mx2^m)$  time complexity, where m is the size of the word. He told me to optimize it. I told him the following approach:

We will keep track of the counts of each character in the word. If the length of the word is even and if all characters appears even number of times, a palindrome can be formed.

Similarly, if the length of the string is odd and all characters but one appear even number of times then Palindrome can be formed.

Else, in all other cases Palindrome won't exist in the word. He seemed to be satisfied with my approach and told me to write the full code.

2. Find all the pairs with a given sum.

3. He gave me a problem to solve. Given two identical ropes of equal length, ,if it takes 60 minutes to burn out the whole rope, how will you measure 45 minutes using these two ropes. You are provided with only these two ropes and a lighter to ignite.

#### Round 2: Debugging and Troubleshooting/Scripting

Tell me about yourself.

1. Given the contents of the file as follow:

Company1 400

Company2 500

Company3 600

Company2 150

Company1 350

Write a script command to find the total cost incurred by Company1.

2. Script command to print the sentence in reverse order.

I/P – “You are in Amazon”

O/P – “Amazon in are You”

3. Troubleshooting scenario – If a customer complains that he is not able to sign in to his Amazon account, how will you troubleshoot?

She told me to write as many points in the paper as possible. Whatever point I was mentioning, she was like – “Anything else? Anything else? :P”

She modified the question and asked me if 3-4 customers complains the same that they are not able to login to their Amazon account, how will you troubleshoot the issue.

Debugging – How will you debug the issue whatever you have troubleshooted.

4. If there is sudden increase in the requests count in the system and you need to answer to the higher authorities, how will you handle the situation?

#### Round 4: Troubleshooting/Debugging/Problem Solving/ Managerial

1. Tell me about yourself.

2. Given a file containing some sample text, write a script command to count the number of occurrences of the word “Amazon”.

3. Given a file containing some sample text, write a script command to change all occurrences of the word “Amazon” with “It” in the file.

4. Given an array of positive and negative numbers, find the maximum product of the pair of numbers in the array.

5. He asked me what project am currently working on. I told I was mainly a backend developer in DB2 as core database. He gave me a query to fetch the 2nd highest value from the column.

6. Tell me a situation where you were working with your team and the team was stuck with some issue for which you were digging out the main problem where the issue is arising and finally you figured out the same.

7. Troubleshooting – A customer is having 2 devices – tablet and android. He is using Kindle app in the tablet and he has made notes and read till 500th page of a book in the Kindle app. Next day he wishes to read the same book from 501st page, but he observes that all his notes are lost from 401st-500th page. How will you troubleshoot this issue.

At last, HR called me and told that I am rejected.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

## Amazon Interview experience | Set 325

### 1st Round(Hackerrank)

- Given an array, find largest sum of

1) Contiguous subarray

2) Non Contiguous Subarray

- Largest region of cells problem

#### 2nd Round(Written test)

- Add two numbers represented by linked list
- Get a number, find next greater element with same digits
- Given a sorted array find if  $a[i]+a[j]=0$  ( $i \neq j$ )

#### 3rd Round(ftf)

- Max Sum level in a binary tree
- <http://www.geeksforgeeks.org/print-nodes-binary-tree-k-leaves/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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## Amazon Interview experience | Set 324 (For SDE2)

I got a call from an consultant for recruitment drive in Delhi.

### 1. first round (1 hour 30 minutes): online written

It was online written round on a platform called Stockroom.io

two questions

A) Two string a haystack and needle is given find at what all indexes needle occurs in haystack as an anagram(0 based indexing)  
for eg:

INPUT

ABACDABCABA

BA

OUTPUT

0,15,8,9

time complexity O(n) expected. The only thing to pay attention was that ASCII characters starts from A

B) Given A company's hierarchy where each employee reports to exactly one manager. and one manager can be reported by multiple employees, implement necessary setter getter functions in object oriented way. also write a helper instance methods to return lowest common manager for two given employees  
answer to this question was simple but had to write object oriented code and zip it then upload it.

### 2. second round(1 hour): Design round

this was most critical and important round.

A) Design a geographically partitioned multi-player card game, that supports multiple players, multiple games at a time.

Each game will have one contractor like ones we have in a bar, He can play a game or just watch it. integrate payment systems.

first HLD was required, use cases, flow diagram. then a low level design was required all necessary classes where will u use polymorphism, where inheritance, multithreading, synchronised approach if needed, socket connections

other things that surfaced and he asked as interview goes : round robin load balancer, hash-map based load balancer, two layer caching, nosql db, design patterns, solid principles, ACID property, CAP theorem etc.

interviewer was a senior person and knew a lot. I was nervous in this round but answered well.

B) many behavioral questions

### 3. third round (1 hour): technical

A) many behavioral and "what if you were in a situation" questions

B) Given an array of words which comes in a dictionary of some language in the same order.

tell if its possible?

ans. represent characters of words as a graph and find out if graph is cyclic (cycle in directed graph)

the interviewer was very supportive. He gave me few important hints in terms of question understanding.

### 4. fourth round (1 hour): technical

he asked me what you like , I said array questions He started laughing.

A) given an array of integers and two types of queries point update and range sum?

ans: I said binary indexed tree then he asked for other ways I said segment tree, He asked more , I said prefix array or sqrt decomposition.

he asked me to write code for the same. made some variations like lazy propagation.

B)topological sorting. given a words of dictionary tell alphabet ordering.

C) many behavioural questions

Hr came and told me that we are done for the day one more interview is there which was on next day.

Hr was very supportive she gave me some constructive feedback and told me to get prepared well and come next day as next day was with a Bar Raiser.

### 5. fifth round (1 hour): technical+ design + behavioural, Bar Raiser

A) asked tree related questions , how to represent and model a tree.

B) Design a Netflix type system. start from HLD to LLD. detailed discussed happened on this discussion on search, video serving, authentication, encryption, dns lookup, which caching strategy would you chose? serving multi quality video etc.  
C) few behavioural questions.

**Few things to remember:**

1. for technical go through geeksgforgeeks practice test and interview experiences
2. for design have a look at carreercup
3. review OS concepts.
4. recruiters and hr is very supportive
5. prepare for behavioural questions well.
6. prepare "do you want to ask any questions?"

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

# Amazon Interview Experience | Set 323 (Software Development Engineer – Off-Campus)

I applied off campus for the role of Software Development Engineer at Amazon, Hyderabad.

### Round 1 (Telephonic) : 1 hour

Interview began with my intro and briefing of my work at current company. Then he asked me two coding questions :

- **Ques 1 :** You are given an array of size n. Now print the number of distinct elements in the array for every frame of size k.
- **Ques 2 :** A binary tree and a number, say k are given. Print every path in the tree with sum of the nodes in the path as k.(A path can start from any node and end at any node, i.e. they need not be root node and leaf node; and negative numbers can also be there in the tree)

After two weeks, I got a mail to come for the face to face rounds of interviews.

### Round 2 (F2F) : 1 hour

Interviewer was very friendly. I was tensed before entering into the room but after talking to him for a minute, I started feeling comfortable. He started with his introduction and then asked me about myself and the work I am doing in my current company.

Then, he moved on to the coding questions.

- **Ques 1 :** A binary tree is given. You need to print every path in the tree starting from root with sum of the nodes of an path equal to a given number, k. (Numbers can be negative too)  
Sol : <http://www.geeksforgeeks.org/given-a-binary-tree-print-all-root-to-leaf-paths/>
- **Ques 2 :** A linked list is given in which every node has two pointers, one to its next node and the other one, random pointer, pointing to some other node in the linked list. You have to clone the given linked list.  
Sol : <http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/>

Some questions that arose as a result of discussion on OS were :

- Q1 . What is critical section problem and how is it solved?
- Q2 . What is Semaphore?
- Q3 . What is race condition?
- Q4 . What is write lock and what are the conditions of it?
- Q5 . What are threads and processes?

Then he asked me if I had any questions and then I was asked to wait for the result of this round.

I was called after sometime for the next round.

### Round 3 (F2F) : 1.25 hour

In this round, two people were there, both were looking like some senior persons at Amazon. They discussed only about my project in the current company in detail. They didn't ask anything else in this round.

### Round 4 (F2F) : 1 hour

Interviewer started with his introduction and asked me for mine. Then he asked me to brief my company project.

Then he asked two coding questions :

- **Ques 1 :** A browser is being designed and you have to implement the history feature in that, which will have two functions, one is to fetch recent 100 urls (getHistory() ), and other one to update that recent 100 urls list whenever a url is hit ( updateHistory() ).
- **Ques 2 :** An array is given and it can be of four types :
  - (a). increasing
  - (b). decreasing
  - (c). first increasing then decreasing

(d). first decreasing then increasing

Without traversing the array we need to tell its type. There was a long discussion on this question.

#### Round 5 (F2F) : 1.5 hour

Interview started with the introductions of me and the interviewer.

Then, he scanned my resume and started asking me about the projects I mentioned. Then he told me to select any of the projects and explain everything from scratch including my role, number of persons involved in the project and the role of each person. He also asked me the title of research paper I used to implement the project but I didn't remember the title so he asked me name of any one author who was part of the research paper. I told him a name and he searched for the paper on his laptop there only. Discussion on the project was approx 45 minutes long.

After discussing the project in detail, he gave me a coding question and we discussed that question also for approx 45 minutes.

Question – There is a number given in the form of a string. Number can be any long. Now I have to tell just greater number of the given number which is a palindrome also.

Sol : <http://www.geeksforgeeks.org/given-a-number-find-next-smallest-palindrome-larger-than-this-number/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 322 (Off-Campus)

Recently I attended interview at Amazon for SDE 1 profile.

#### Round 1 (Written):

3 questions were given and I was asked to write the executable code in any language.

1. Check whether the tree is BST. ( $O(n)$  time).
2. Check whether the Linked List is Palindrome. ( $O(1)$  space).
3. One array (Array 1) of size  $m$  with  $m$  sorted elements and another array (Array 2) of size  $(m + n)$  with  $n$  sorted elements, you have to put all the elements from both the arrays in Array 2 in sorted order. ( $O(1)$  auxiliary space and  $O(m + n)$  time).

#### Round 2 (F2F):

1. Given a stack of integers of size  $n$ , you have to sort it using only push and pop operations (you are not allowed to copy the numbers in auxiliary array and sort it and then push back in array). (I gave  $O(n^2)$  approach and  $O(1)$  auxiliary space).
2. Stepping on stairs: A valid move is defined as either a single step or 2 steps. Starting from 1st stair you have to reach  $n$ th stair in minimum valid moves. I gave dp approach then rolled down it to Fibonacci formula which can be solved in  $O(\log(n))$  time using Matrix Exponentiation.
3. Stepping numbers: A stepping number is defined as a number in which the absolute difference between the consecutive digits is not greater than 1, A stepping number cannot be a single digit number. You have to find the number of stepping numbers between  $n_1$  and  $n_2$  where  $n_2 > n_1$  and  $n_2, n_1 > 0$ . First I gave brute force approach i.e. traverse from  $n_1$  to  $n_2$  and print i if i is a stepping number. They asked me to optimize it, after a little while I came up with BFS solution, where a node in graph (directed) represents a number and nodes directly connected to it have one more digit appended at the end. Stop when number dequeued from the queue is greater than  $n_2$ .
4. Iterative version of Tower of Hanoi. I gave stack version of TOH. Since recursion uses recursion stack. I removed recursion and used stack to imitate recursion instead. They were satisfied with the solution.

#### Round 3 (F2F):

1. In any point of time print the first non-repeating number in a stream of numbers. It took me quite a while and after little brainstorming I came up with solution using DLL and map.
2. Delete node in a BST. I had forgotten how it was done so again I had to think hard, realized that deleted node must be replaced with its inorder successor to maintain the BST property and coded the solution.
3. This was the most exciting round. They seemed happy with my approach.

#### Round 4 (Design Round):

1. Design a Parking Lot.
2. Create queue using stack.
3. Discussion on all the OS scheduling Algorithms.
4. How to implement SRTFS (preemptive SJF).
5. Discussion on Inter Process Communication : Shared Memory and Sockets.
6. Why sockets are preferred over Shared Memory.
7. Where shared memory is stored (in user space or kernel space) ? and why ?

#### Round 5(Hiring Manager Round):

1. General Discussion.
2. Infix to Postfix conversion.

3. Return a maximum length sequence containing consecutive numbers from a binary tree. i.e.

```
90
 / \
1 66
 / \
2 67
 / \ /
5 4 68
 / \
99 100
```

Consecutive sequence of maximum length: [66, 67, 68] of length 3.

I had the hunch but was not able to code it at first, so he asked me to do it later then after some discussion, i was given 15 min to complete it and finally in those 15 min it clicked and I managed to do it.

#### Some advice:

1. Practice coding on paper, try to do write clean code without overwriting.
2. Brush up important concepts of OS.
3. They concentrated more upon the thought process to reach the final solution. So think loudly and you will receive hints ;).
4. Keep calm and remain confident.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 321 (Online Assessment)

Just completed Amazon's online assessment that was given a week in advance to prepare for.

It consisted of two tests on:

1. Code debugging (20 min)
2. Reasoning (35 min multiple choice)

The first part were 6 questions. Each with a provided code where it asks you fix and make changes so it can compile/run correctly. Most of these problems were errors with syntax, parameters, operators, and others along the same lines. The second part were 24 questions on patterns, logic, and some others like concluding a given passage. Everything during the test is monitored and questions can be returned to if moved on. Before starting it gives the option of selecting a programming language from C, C++, or Java. For me I chose C. If you ever coded at a university in a beginner/intermediate computer science class, then you should have no problem getting through this. I just graduated last month so everything was fresh to me still. I reviewed several old homework assignments that helped out a lot with the basic understanding of algorithms and memory allocation. A lot of people told me to study from the "Cracking the Code Interview" by Gayle, which I vaguely looked over and found it did not help as much for this assessment, though it might for the next interview processes. The most difficult aspect for me was the limited amount of time, especially the first portion that requires you to read code line by line. I highly suggest you take your time to read the question once and carefully, then answer if you can and if you cannot then skip it and return if time permits. Other than that, I found it far simpler than what I had expected and overly prepared for. They said I will be contacted for the next interview step within a week.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 320 (Off-Campus)

Recently i attended interview at amazon hyderabad for SDE-1.

#### Written round Two questions

1. Find the unique character from two strings  
<http://stackoverflow.com/questions/29794233/how-to-print-unique-alphabet-from-two-strings-using-java>
2. Parenthesis match problem  
<http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>

#### Face to Face

1. Two colors are given(yellow, blue), we have to color such that no consecutive blue color is painted

Given the arrival and departure time of various trains in a station. Calculate the minimum number of platforms required such that no train has to wait for another

train to vacate the platform.

The question basically means calculate the maximum number of trains that would be present in the platform at any given time.

#### Answer

sort the arrival time and sort the departure time, keep a count initialized to 0. compare the first element of the arrival time with the first of departure, increase the value of count if the value at current Index at arrival is less than the value index at departure and increment the arrival index, and vice versa. Keep the maximum count that you see.

#### Second face to face

1. Implement stack using queue

<http://www.geeksforgeeks.org/implement-a-stack-using-single-queue/>

2. Reverse linked list form n occurrence -----not so good

<http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/> 1->2->3->4->5->6->7->8

if k=3;

3->2->1->6->5->4

#### Third face to face

1. Design elevator in OO perspective.

2. How class is loading in JVM:- Discussed about eden, perm space. using graph and BSF & DFS.

3. Clone the binary tree.

I didn't got call after that.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 319 (On-Campus)

#### Online Round:

There were 20 MCQs based on basic programming, C output questions, OS. There were 2 programming questions.

1. Given an array with only 1s and 0s, You have to maximize numbers of 1s in this array. You are allowed to do max one flip operation which can be applied to a range of continuous indexes. I used something like max sum contiguous subarray dynamic programming approach. This problem is similar to <http://www.geeksforgeeks.org/maximize-number-0s-flipping-subarray/>

2. You are given a linked list.

for i=1 to n/2, subtract (n-i)th number from ith number. Print modified linked list in the end.

#### Technical round 1:

1. Given three numbers A, B and M. Calculate  $(A \cdot B) \% M$ . All numbers are in a range of 1 to  $10^{15}$  so prevent overflow. First I gave brute force approach for running a loop A times, each time adding B to the answer and taking the mod. Then, I improved from  $O(n)$  to  $O(\log n)$  by calculating  $A \cdot B / 2$  recursively and multiplying it by 2. The interviewer asked me to write complete code for it.

2. He asked me whether I know about trie data structure and I said yes so he asked me to write node structure of trie. I wrote the basic node structure. Then he asked me if I want to add and match exact strings then how would I modify node structure. I told him to add a boolean in the node signifying an end of the string. Then he asked me to write complete code for adding a string in trie root.

#### Technical round 2:

He asked me introduction and questions asked in previous interviews.

1. Given a binary tree, print the edge nodes of this binary tree.

<http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>

2. You are given an array of contacts. Each contact consists 3 strings: name, email and phone number. If any of these parameters match with any other contact's parameter then these 2 contacts are same. Find groups of same contacts. I suggested having a hashmap with parameter string as key and index as value. Then when we encounter matching strings in the hashmap, connect this 2 contact indexes as we do in Disjoint set Quick Union approach. In the end. find matching contacts using find operation.

#### Technical round 3:

This interview was mostly based on resume discussion. He asked me about my internships and projects and also asked me some OS questions. Then he gave me a chess problem. I am given initial positions of 8 pawns and a knight. I have to answer whether I can remove all 8 pawns using my knight. Then he simplified question and now only 1 pawn is there. I wrote full code for recursion to solve the problem but time complexity was exponential. Then he asked me how do I find the minimum number of steps in which I can remove this pawn. I modified my existing code to return a number of steps now.

#### Technical round 4:

This was kind of like HR round. Initially, he asked me about my latest internship work and started with specific questions. What was the toughest challenge I solved during any of my projects? What kind of problems you encounter when working in a team and how can those be resolved? Did you ever write non-maintainable code and why did you write it? Did it ever happen to you that you suggested some good approaches but they were thrown to trash by higher authority and how did you tackle with that?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 318 (For SDE Intern)

The First Round of test was taken online by Amazon on Hackerearth.

### First Round:

- 20 MCQs
- 2 Coding Questions:
  - Find zeroes to be flipped so that number of consecutive 1's is maximized  
GFG Link: <http://www.geeksforgeeks.org/find-zeroes-to-be-flipped-so-that-number-of-consecutive-1s-is-maximized>
  - Find the first circular tour that visits all petrol pump (Similar to this)  
GFG Link: <http://www.geeksforgeeks.org/find-a-tour-that-visits-all-stations>

### 2 Technical Rounds:

They take time in declaring results as they ensure that all eligible candidates make it to the Technical Interviews. Technical Rounds also consists of coding. Here, you need to discuss your approach with the interviewer and then code it on paper.

#### 1st Technical Round:

General question of Tell My About Yourself. Following this were technical questions mainly coding.

Q1. Find the position of the rightmost set bit.

I gave various approaches, firstly dividing by 2. Then they asked for a solution using bit operations. Gave them solution using OR. GFG Link: <http://www.geeksforgeeks.org/position-of-rightmost-set-bit/>

Q2. Time complexity of Binary Tree: Searching, Inserting

#### 2nd Technical Round:

Again asked Tell My About Yourself. There were 2 coding questions asked.

Q1. Large number sum using Linked List.

2 Approaches: Reversing the linked list and then adding or Recursion. Gave both the solutions. Then the question was: In case of a billion digits, which would you prefer? Recursion has a lesser time complexity but, a normal system won't be able to operate so much on recursion, as there will be a stack overflow. Hence for a billion digits we have to go with reversing the linked list and then adding each digits.

GFG Link: <http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>

Q2. Find an element in a strictly row sorted and column sorted 2 dimensional array without brute force.

GFG Link: <http://www.geeksforgeeks.org/search-in-row-wise-and-column-wise-sorted-matrix/>

Q3. Questions on Sorting and Searching algorithms complexity.

Q4. Questions on Networking

What is BGP(Border Gateway Protocol)?

What is Link State Routing? How does it work?

What is OSPF?

TCP/IP model and OSI model.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

# Amazon Interview Experience | Set 317 (SDE-1 Off – Campus)

### Round 1:

1. Tell me about yourself.
  2. Trapping Rain Water :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.  
<http://www.geeksforgeeks.org/trapping-rain-water/>
  3. Print left view of a binary tree.  
<http://www.geeksforgeeks.org/print-left-view-binary-tree/>
- Discussion : I gave two approaches one with DFS and other with level order traversal.
- He asked to compare two approaches and implement the efficient one. DFS is the efficient one because in level order, you need to store all the nodes at each level, some of them may not be a part of the left view of BT.

#### Round 2:

1. Tell me about yourself.
2. Find sum of n elements after kth smallest element in BST. Tree is very large, you are not allowed to traverse the tree.

Discussion : Since the array traversal is not allowed so we need to do some preprocessing over the tree, something like storing sum of all its predecessor nodes. For finding kth smallest element, use order statistics approach:

<http://www.geeksforgeeks.org/find-k-th-smallest-element-in-bst-order-statistics-in-bst/>

3. Given a sorted array which has been rotated n number of times. Find the value of n. It is similar to below post where you need to find only the pivot element. If you have the Index of pivot element, you can get the number of times the array is rotated.

<http://www.geeksforgeeks.org/search-an-element-in-a-sorted-and-pivoted-array/>

#### Round 3:

1. Count ways to reach nth stair.

<http://www.geeksforgeeks.org/count-ways-reach-nth-stair/>

It is similar to fibonacci series. Interviewer asked various ways to implement the same -Recursion, 1-D array, with 3 variables and complexity of each.

2. Design recommendation engine.

It's like auto suggestion. I gave the trie approach. The interviewer seemed fine with this approach and asked me to write full code with time and space complexities. Implementation of Tries:

<http://www.geeksforgeeks.org/trie-insert-and-search/>

#### Round 4(Managerial Round – Over video call)

1. Tell me about yourself.
2. Current work
3. Which project you liked working the most.
4. Any case where you had conflict with your manager.
5. Any idea/technology suggested by you to your team which then got implemented and worked out.
6. Any case when you had to work out of your comfort zone.
7. The most critical feedback received from your manager/team members.
8. What do you do to enhance your technical knowledge apart from your project work.

And many more.

#### Round 5(Final Round – Telephonic)

1. Initially I was asked questions about the work I had done, the projects I did and some managerial questions.
2. Then I was given a coding problem to solve. They use Collabedit tool in phone screen interviews where the same screen is shared by both interviewer and interviewee.

**Ques :** Print all the non-repeating words out of two given sentences.

**Eg. Statement 1:** I have a blue pen.

**Statement 2:** I got a red pen.

**Output :** have blue got red

**Discussion :** I suggested the hashing approach. The interviewer asked to implement the same.

#### Points to take care:

- You must know how to calculate time and space complexities
- In each round they ask you about the project you recently did/ the project you liked working most/ most challenging work etc- so you should be prepared well for at least one project with in-depth details.
- Start with the naive approach for each question asked and then proceed with solutions with better space and time complexities.
- No need to waste time reading about Operating Systems, Networking, DBMS etc. They only care about the projects you did and your coding skills whether you cover all the edge cases while writing code, know time and space complexities, have better approaches for solving same problem and so on.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

## Amazon Interview Experience | Set 316 (On-Campus)

### Round 1- 90-100 min

- First Ques- So what you know about Amazon- I wasn't prepared to start my interview with this ques. But I had read months earlier how Amazon was established and was able to satisfy him with answer.
- 2 ques- Tell me about Summer Intern at wipro- It took around 20 min. Deep discussion on project, all in and out.
- 3 Ques- How does the program gets compiled internally, I told him I have not studies this part as my branch is ECE. He then asked me what have you studied- I told him DS algo ,OS, Networks and convinced him that ECE is strongly related with CS in terms of Algorithm.
- 4 ques- As i told him that I like competitive coding, He asked tell me 1 quesess- I told him- Find the K-most frequent occurring word till now in

- a running stream of words by using Trie(modified) and Heap concept. He asked why I am using min heap and not Max heap and I gave the reason.
- Everything about Min Heap-> Insertion deletion modification.
  - Given data How will you sort them. I told him quick sort , merge sort are possible ways. He asked which you will prefer I told him QuickSort . Why not Merge sort? I told him because of external memory use but then he asked that can't we do it in-place , later on I was able to do inplace merge sort and he again asked which algo you will prefer I told still quicksort because it is more Cache Friendly and he was satisfied.
  - Given 100 gb data, you need to sort them how will you proceed. I told him external sorting and he straight away told me I don't want merge sort. Then I tried to twist the situation by asking what type of data is available. He was in doubt why am I asking that, So I told him if all the data is in limited range then I can simply apply counting sort and he was impressed as well he forgot about the actual question. ☺
  - He was done with the interview and said do you have any ques. ME- What role will be playing in the team if selected.

In 2 min They told me that i was cleared for 2 round.

#### **Round 2**

I went for 2 round without wasting time as Spot On offers were to be given. Interviewer was slightly weird and he straight on went for the ques. There is data available for different vehicles and all vehicles have n parameters which distinguish it with other vehicle so given huge data you need to separate them in different lists based on some parameters matching. How will you proceed->Then he said 3 parameters are there and if all 3 parameters match then they belong to same list. I told him lets sort the data according to first parameter then for then sort acc to 2 para and so on..(something like Radix sort). He told me to use Hash-Map and model the whole idea....building the structure for each vehicle and then use key to do hash-mapping. I implemented it but due to too much overwriting, He was not looking impressed but he told its correct. DO u have any questions. After this Round I was rejected.

TIPS-

1. Please be prepared for Hash\_MAP it is very important to have deep knowledge as this part is rarely covered in.
2. Try to write clean codes and by clean code I mean you shoud use good variable name, dont scribble much and try to write comments along with it.(I made a mistake here.)
3. You should know all in and outs of the project and remember interview can ask any project.
4. Puzzles don't matter much...

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 315**

Interviewed for Mumbai location.

#### **Round 1 (Written round – 45 min)**

1. Count the number of occurrences in a sorted array : <http://www.geeksforgeeks.org/count-number-of-occurrences-in-a-sorted-array/>
2. In given range, print all numbers having unique digits. e.g. In range 1 to 20 should print all numbers except 11.
3. Given a node, you can even find the next highest node in O(log(n)) time : <http://stackoverflow.com/questions/20990808/bst-finding-next-highest-node>

#### **Round 2 :**

1. Tell me about yourself
2. A 'plus' pattern of size 1 is defined as following :

```

1
1 1 1
1

size 2 :
1
1
1
1 1 1
1
1

```

Find size of largest plus pattern in given 2D matrix which has only 0s & 1s.

#### **Round 3:**

1. check if a binary tree is BST or not :<http://www.geeksforgeeks.org/a-program-to-check-if-a-binary-tree-is-bst-or-not/>
2. Min Cost path : <http://www.geeksforgeeks.org/dynamic-programming-set-6-min-cost-path/>
3. Check if two linked lists merge : <http://stackoverflow.com/questions/1594061/check-if-two-linked-lists-merge-if-so-where>
4. Count ways to reach nth stair : <http://www.geeksforgeeks.org/count-ways-reach-nth-stair/>

The guy opened geeksforgeeks link in front of me and was asking from there directly!

#### **Round 4 (Skype Round):**

1. Tell me about yourself.

2. Tell me most challenging project you did. 30 min detailed discussion about project. (So, choose answer to this wisely)
  3. Find the smallest window in a string containing all characters of another string : <http://www.geeksforgeeks.org/find-the-smallest-window-in-a-string-containing-all-characters-of-another-string/>
  4. How HashMap is implemented? (<https://tekmarathon.com/2012/12/04/hashmap-internal-implementation-analysis-in-java/>)
- \*This is most favourite question of Amazon\*

**Round 5 (Skype round):**

1. Tell me about a situation when you had conflict with manager.
2. Tell me about situation you screwed up something.
3. What is the most technical challenging work you did?
4. Implement LRU cache : <http://www.geeksforgeeks.org/implement-lru-cache/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### Amazon Interview Experience | Set 314 (For FTE)

Recently Amazon came to our college for both FTE and interns. Here I am sharing my interview experience. There was 1 online round and 3 F2F interviews and 1 Bar Raiser round.

Online round had 2 coding questions and 20 (MCQs based on sorting complexity, Recursion, quantitative aptitude , geometry etc).

#### F2F 1

He introduced himself and asked me about my project.

Then He asked me these questions

1. Find the maximum of all subarrays of size k.-<http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/>.

I gave him a  $O(n^2)$  approach, then  $O(n \log(n))$  approach using segment tree, then  $O(n \log(k))$  using max heap and then  $O(n)$  approach using deque. He asked me to write the full production level code.

2. Find the first non-zero digit starting from right in  $n!$  Simply keep the last digit of every multiplication, gave an  $O(n)$  approach. He seemed to be satisfied.

#### F2F 2

He asked the following questions

1. He asked me to make a dictionary in which i had to search a string and if it is not present , i had to insert in dictionary. Gave a  $O(n \log(n))$  approach using map. He asked to optimize it , then gave a trie approach. He asked me to write full code for it.

2. He asked me, what is LRU cache and how it is implemented. Then he asked me to write the full production level code for it.

#### F2F 3

This interview was a design round as well as theoretical round.

1. Firstly, he asked me about my favorite subjects. I told him operating system. Then he asked me about process scheduling algorithms and then he asked me how will you allocate memory to a newly formed file. I told him about first fit, best fit and worst fit. He asked me what are the advantages and disadvantages of these.

2. Then he asked me a design question. Let's say you have a 13 floor building and it has 6 lifts in it, you have to design an algorithm such that if a user click the lift button, any of the available lift should reach to him in minimal time.

3. Then he asked to give the design for top k trends of twitter of facebook. I told him that i'll keep a trie for storing the count of the number of users associated with a particular trend and will keep this count in max heap and will extract top k trends.

Solution for design varies from candidate to candidate. so you should design your own solution rather than searching solution on google.

#### F2F 4

This was a Bar raiser round and it was telephonic. He asked about my project and we had discussion on it in detail . After 40 minutes he asked me to write the full production level code on implementing LRU using circular linked list. It was easy and i had done that in second round also, so i wrote the whole code and he was satisfied.

verdict: selected ☺

#### Thanks GeeksforGeeks !!

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 313 (For SDE II)

## 1st Round(Written) – 60 mins

It was a test on HackerEarth with two programming questions

1. [The Maximum Subarray problem](#): Given an array A of N elements, find maximum possible sum of
  - a. Contiguous Subarray
  - b. Non Contiguous Subarray
2. Connected Cell in grid problem. Find the number of cells in largest region.

## 2nd Round (DS and Algo) – 45 min

1. [Palindrome Partitioning](#)– Spilt a string into minimum number of substring such that each substring is a pallindrome.
2. [Find the diameter of a binary tree](#)

General discussion on current role.

## 3rd Round (DS and Algo) – 45 min

1. find differnce in height of two nodes in a binary tree.
2. [Multiply two numbers represented as a linked list](#).

## 4th Round

Detailed Discussion on current role and responsibilities.

Discussed complete architecture of my current project- in terms of classes and methods, databases and cache used and then discussed improvements that i could suggest in architecture of my project.

## 5th Round

Discussion on current role and responsibilities. Discussed on architecture of my previous projects and technologies i have worked on.

Design question- Design a enhanced search that can help customer executives to search for the query asked by user through all the possible sections like- payment, order etc.

## 6th Round

Design a job scheduler.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 312 (For SDE II)

I was not able to recall phone interview question from Amazon for SDE – II . After few days from phone interview, I got an email invitation to fly for face to face interview. Below are the questions that I was asked during the in-person interview.

Round 1:

Write a program to check whether it is a valid binary tree or not.

Check all test cases (e.g. No left Node case).

Behaviour Questions

Round 2:

Behaviour Questions

Tell me your current job roles, responsibilities , Challenges and improvements that you can make on your current project

Round 3:

A lot of Behaviour Questions again

Introduction, your current roles and responsibilities

Round 4:

Various Types of Behaviour Questions

Design a kind of kindle fire application where we can subscribe news channel and read the news from all publishers as a digital format.

Round 5:

Behaviour Questions

Design an OOP concept for an application where employee can dispatch their incoming phone call according to their seniority level if they are not able to solve.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 312 (Off Campus)

I got a call from amazon for F2F discussion for SDE1 at hyderabad. There were totally four rounds and asked to leave for the day.

## First round:

1. Find the **kth smallest element in row wise and column wise sorted matrix**. (No Heap solution)
2. There is a given data with time and number of orders at that time and it will random. Then there will be a query of how many orders placed between a given interval of time.

## Second Round:

1. <http://www.geeksforgeeks.org/minimum-number-of-swaps-required-for-arranging-pairs-adjacent-to-each-other/>
2. There given a list of strings out which we have to print the unique strings. Unique string is a string which is not repeated.

## Third Round:

It was a discussion on my current project and the challenges I faced and how I managed when I am unable to meet the deadlines.

1. There given a 2 Lists with int values. We need to find the longest chain. Eg: L1 = { 2,7,4,8,9,10}, L2 = {1,2,8,9,4}. Here the solution is 2 (chain is 2,4 or 8,9). Because 7 is present in L1 which is not L2.
2. Given a equi-weighted uni directed graph and need to find the max distance possible from a given node.

## Fourth Round:

It was again discussion on my current project.

Final question of my interview: Add 1 to the integer represented by a linked list with O(n) time and O(1) space.

First I start with the recursion and he suggested me without stack space too. Then I suggested for the reversing of linked list and then adding the number. He was again asked me without reversing of linked list. Then I came up with the solution with linear search.

Thanks **GeeksforGeeks** for your work in helping so many programmers!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 311 ( On Campus for Internship and FTE)

Recently Amazon came to our college for both FTE and interns. Here I am sharing my interview experience. There was 1 online round and 4 F2F interviews. Online round had 2 coding questions and 20 MCQs (based on OS, sorting complexity, Recursion, DBMS , geometry etc).

## F2F 1

He introduced himself and asked me about my project which I had done in Samsung Research Institute this year.

Then He asked me these questions

1. Suppose there is only one platform and n number of trains. So at any point of time only 1 train will stay in platform. N time intervals are given which represent the timing duration of n trains.You have to find what is minimum number of trains that have to be postponed such that no collision take place.(full code was required covering all corner cases)
2. Suppose a string “abca” is given. Print all of its permutation such that no 2 same combination will be printed twice. (Considering string can have duplicate characters). (full working code required)
3. Asked me what DS I will use to evaluate a given expression? Then Asked to write the code of Infix to Postfix conversion.
4. There is an array of N numbers ranging from 1 to N. Only 1 number is missing, return the index of that number.

## F2F 2

Asked me many question regarding my project for first 10 minutes.Then asked the following questions

1. A matrix is given containing only 1 and 0. So whenever you access a 0 make the entire row and column as 0.  
I was using O(n<sup>2</sup>) space first, he said to use O(n) space only.

2. Given a binary tree **find the minimum root to leaf height**.

I told him a level order solution where I was enqueueing the level also with each node. He said not to push the levels with each node, so I kept on delimiter which I was pushing only after one entire level traversing was over and returned as soon as I got a leaf node.

## F2F 3

This interview was taken by the senior most person among the interview panelists. I was nervous while entering the room and as a result I messed up the interview. He directly started asking question without any introduction which made me more nervous 😊

1. He wrote one nested recursive program(around 12-15 lines) on a page and asked me to draw the recursion stack of that program and show him in what order one function is called and stored in the stack and in what order it is returned back to its callee function. And to prove what is the space complexity through that recursion stack.

I was nervous and was loosing confidence so could not solve it properly.

2. Find the second largest and second smallest in a given array in single traversal.

3. Find power(x,y) without using pow function.(divide and conquer approach was required)

After this round I did not get a call for the last round. Some of my friends were asked questions on basic BFS application, topological sorting , LRU cache implementation , Boxing stack problem in the last round.

#### Tips

1. Questions asked will be very easy at most of the times. Be confident. Whatever be the question you were asked try to solve it as long as you can, share your approaches with your interviewers. They will certainly help you out.

2. Have a clear idea of your project, they will ask you several questions regarding that.

3. Work very hard.

All the best

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

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## Amazon Interview Experience | Set 310 (For Internship)

Technical round 1:

1 I was asked to implement L.R.U.(least recently used cache) using any DS i want

2 Build a Binary Tree using inorder and preorder

Technical round 2:

1-Quick sort

2-Questions about DBMS and DS to make it more efficient

3-Find minimum and maximum number in an array with minimum number of if statements

4-Discussion about c++

They didn't conduct more technical rounds.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

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## Amazon Interview Experience | Set 309

0th Round: (Online): 20 MCQs + 2 Coding Questions In hackerrank platform:

MCQs Topics:

Quantitative aptitude(speed,mixture,ratio etc)

C apps (find o/p time complexity)

Os,DBMS

MCQs based on quants was little bit challenging.

Coding Questions:

1) Size of Largest subarray with given sum.

2) Reverse Individual words in a string.

i/p : This is a game

O/p: game a is This

After this round 39 were short listed.

There were 4 rounds of interviews(all technical)

#### Round 1:(1 hr written round)

1)zigzag traversal of a binary tree.

<http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

2) Find the size of largest island from a group of islands.

A variation of: <http://www.geeksforgeeks.org/find-number-of-islands/>

There were 13 people 39 were divided to thirteen groups and one was eliminated in each group.

**Round 2:(1 hr Face to face)**

First question was tell me about yourself.  
Thoroughly went through my resume.  
Asked me about my projects and internship experience.  
Then a question came in Arrays.  
Q) Replace every element by its Immediate greater element

i/p: 5 6 3 10 9 12  
o/p: 6 10 10 12 12 12.

Then os questions came.

- 1) what is virtual memory?y is it so called?
- 2) paging and segmentation concepts.(in and out)
- 3) size of virtual memory.

Then he asked me "do u hav e any questions?". I asked few questions in Amazon cloud drive.

**Round 3:(1hr 15 min Face to face)**

First question was "tell me about yourself".  
Then the Questions came:

- 1.Find Minimum in each k sized window.

i/p:12 3 4 10 6 5  
k = 4  
o/p: 3 3 4

I told him the Queue approach he is not satisfied. Then I started with dequeue ,he stopped me and asked me to use data structure other than queue. I told him min heap approach. He seemed to be satisfied .He asked me to write a production level code for that.

2. A new tree data structure is given in which each node has two values top and bottom, when all the nodes are arranged in tree, the top vales of all nodes must follow BST while the bottom values must follow min heap. elements can be inserted in any order(not the order of arrival).

I gave my solution. He was satisfied and asked me to write a production level code for that.

Finally, "do u have any questions?"

**Round 4:(1hr 30 min Face to face)**

1. The celebrity problem: <http://www.geeksforgeeks.org/the-celebrity-problem/>
2. Count possible decoding sequence: <http://www.geeksforgeeks.org/count-possible-decodings-given-digit-sequence/>
3. We are receiving a stream of data from a social network, how will you display k max persons based on number of friends?

He was satisfied with my approach of max heap.

Finally, "do u have any questions?"

After each interview some were eliminated.

Thanks to geeks for geeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 308 (On-Campus for Internship)

Online Round (1 hr 30 min): 20 MCQs and 2 coding questions

**MCQs :** There were 20 MCQs based on DS, OS, IQ and output questions.

**Coding questions:**

1. Given an expression containing alphanumeric characters and parenthesis, check if "(" and ")" are balanced. <http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>
2. The preorder and the inorder traversals of a binary tree are given.Convert this to a tree where each node contains the sum of the left and right sub trees in the original tree. The values of leaf nodes are changed to 0. Print the preorder and theinorder traversals of the modified tree. <http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>

### Technical Round 1 (around 1 hr)

1. The interviewer asked me about my project, mainly the database part.
2. Given a rectangular matrix and n moves. If you are at a position (x,y) , you can move to (x+1,y) , (x-1,y), (x,y+1), (x,y-1). What is the probability that after n moves ,you will remain inside the rectangle?
3. <http://www.geeksforgeeks.org/find-four-elements-a-b-c-and-d-in-an-array-such-that-ab-cd/>

### Technical Round 2 (around 1 hr)

1. The interviewer asked me what data structures I know. Then he asked me the applications of graph.
2. Suppose there is a social networking site like Facebook. Every user gets some friend recommendations (i.e. People you may know!). Now, if there is a user A and he has 100 friends and each of his friends has got 5 other friends,A can get these 500 recommendations. But the condition is that he should only get the top 10 recommendations with whom he has the maximum number of mutual friends(If A and B are friends and B and C are friends, then A and C have a mutual friend, B). Suggest an efficient data structure for this and how to implement it. The implementation should be flexible as at any moment, any user can make new friends

and he may also unfriend someone!

3. Applications of heap. Insertion in a [heap](#) ( insertion of strings in a heap, priority is decided lexicographically). Time complexity of insertion.

#### Thanks GeeksforGeeks

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

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## Amazon Interview Experience | Set 307 (Off-Campus)

I got call from consultancy for Amazon. After profile shortlisting, i received online test and then had telecom interview. After I went to Pune for f2f interview. HR shares all the topics need to study for interview. Below are the details of all rounds.

### Round 1: Online test

Hackerearth

2 programs with 75 mins duration.

### Round 2: Telecom interview

2 coding programs here too. Initially approach need to discuss, and once it's concrete and finalized they will ask to write code.

1. Find level with maximum nodes on binary tree
2. Addition of infinite size of integer

### Round 3: F2F design round

- Design parking system

### Round 4: F2F design round

- Design notification system

### Round 5: Coding round

1. Remove half nodes from binary tree
2. Swap elements in linked list

### Round 6: coding round

1. LRU cache implementation
2. Copy binary tree and create new. Binary tree has left, right and random pointer

In any round they will discuss your project in dept. And asks for alternatives for technologies used in your application.

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## GATE CS Corner Company Wise Coding Practice

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## Amazon Interview Experience | Set 306 (On-Campus)

Amazon came for FTE as well as internship.

MCQ consisted of 20 questions. 18 were related to mathematics and ds/algo. Everyone found ds/algo questions simple while maths questions were from topics like pipes/cisterns, distances, log, etc were quite complicated. I managed to get about 10+ correct and both coding questions correct to crack the online round.

The two coding questions were:

- 1) Largest subarray sum ( $O(n^2)$ ) was even getting accepted!)
- 2) Reverse individual words of sentence

eg-

i/p This is a game

o/p-game a is This

### Round 1:

First round consisted of following questions:

- 1) Given an array of string and array of characters find the string with atleast one and the most occurrence of all characters in array of characters. If there is tie print first occurring string.

```

eg:vector<string> = {"abcda", "aaaaaaaa", "abcc"}
vector<char> = {'a', 'b', 'c'};
answer should be abcda
2) Check whether tree is balanced or not i.e check balance factor O(n) solution was expected
3) Given a string find longest substring with no repeating characters: O(n) solution was expected

```

I solved all of the q's in first round with best complexity and interviewer was quite impressed.

#### **Round 2:**

In round 2 following q's were asked

- 1) Given n points in 2 d space and two functions JOIN(A,B) and istransitivelyconnected(A,B).  
Join assigns A,B to same set while istransitivelyconnected(A,B) checks whether belong to same set. Solved using disjoint set using path compression
  - 2) Clone a doubly linked list with random pointer.  
Got confused and stuck in this question..but somehow managed to solve with O(n) space using hashing..
- Interviewer was not very impressed coz of 2nd q but still I managed to reach 3rd round.

#### **Round 3:**

Two questions were asked

- 1) Find path with root to leaf sum as equal to target.
  - 2) Given an infinite string defined by function  $f(x)=x+0+f(\text{complement } x)$  find k'th bit  
Solved first one easily, got stuck in second one so solved using brute force...
- However, managed to reach 4th round

#### **Round 4:**

Interviewer was little arrogant to my surprise..he kept staring and grinning while I solved the problem..he also said since it is 12:30 I won't waste time asking to introduce you. although ALL other people had theoretical round involving OS,CN,DBMA concepts I was asked to solve coding problems again..

I was asked my favorite Data structure..I said tree..

- 1) Find shortest distance between two nodes of binary tree..after 2 mins. I said just find LCA in one traversal and then the path of the nodes in other traversal..  
soln is O(n)..he asked me to write LCA code ..i wrote in O(1) space using recursion...maybe he wanted solution in 1 traversal..although he did not tell me that..
- 2) The RAM of pc is 4 gb and file is 40gb in size .File contain numbers..sort the numbers..I came up with dividing files and using heap to sort all the file..  
Asked me to write the data structure...gave something like this..

```

struct heap
{
    int element;
    FILE *f;
}
heap arr[];

```

Got confused with complexity a bit...

Result came out after 1 hour.. I was not selected :(.. We asked about internship they told they did not come for internship although they said this during their presentation the same morning!! But can't help.. life is unfair...

Some of the students got rejected despite having excellent coding skills and amazing profile at codeforces,topcoder,codechef,etc..

Questions asked from other people:

1. Flattening of tree
2. Word break problem

Thanx @geeksforgeeks!!

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 305 (On-Campus for Internship)**

**Eligibility Criteria:** CGPA >=7.5 (with no history of arrears)

#### **Round 1: Technical Test (1 hour 30 min)**

An online test held on HackerRank which consists of 20 MCQ's and 2 coding questions.

- **Coding Question 1:** Find next greater number with same set of digits
- **Coding Question 2:** Merge two sorted arrays with O(1) extra space

#### **MCQ's**

They were pretty simple and straight forward. 5 questions were from general aptitude like probability, permutation and combinatorics. Rest of the questions were from Data Structure, Algorithm and C and C++ output questions. Reading GeekQuiz helped me a lot.

Around 300 students took the test out of which 21 were shortlisted. I was also one of them. We were interviewed the following day.

### **Face-to-Face Interview 1(~1 hour)**

The interviewer asked me to introduce myself. After I gave my introduction, he went straight to the questions.

**Question 1:** A program to check if a binary tree is BST or not

Given a binary tree, we need to check if it's a binary search tree. He wrote the following function

```
bool isBST(Node *root)
```

I asked him if I could modify the function template to include min and max values. He said that I can modify the function template. So I gave my approach as described [here](#). After reviewing the solution, he asked me to explain it with an example. I drew a small tree and explained it to him. He was satisfied and we moved on to the next question.

**Question 2:** Maximum sum such that no two elements are adjacent

Given an array of positive and negative numbers find the maximum sum in the array such that no two elements are adjacent. The question can be found [here](#).

As soon as he gave the question I said it is a Dynamic Programming problem. He asked me to write code. I wrote the code by using a dp array of size n (size of array) and I gave a top-down approach. He thoroughly checked if my code could handle all the corner test cases. He asked me to run the code for array of size 1 and 2. I explained it to him. He was satisfied and we moved on to the next question.

**Question 3:** Find a given word in a matrix of characters.

Given a NxM matrix and string s, check if the string is part of the matrix. We can move to top, left right and bottom from a given cell. The question is similar to [this](#).

Initially after giving the question I said we should use Depth First Search. But he gave me a case where it won't work and asked me to modify the approach. I said BFS and he asked me to write code. I wrote the code by handling all edge conditions. But I missed the visited array part. He read my code and gave me a case where it would run into an infinite loop. Now, I found out what was missing and said I have to include the visited array. He was satisfied and asked me to add that part to the code.

After this, the interview was over. He asked me if I had any questions for him. I asked him a few questions and we were done.

Out of 21 students, 12 students were selected for the second interview. Fortunately, I was also selected.

### **Face-to-Face Interview 2(~1 hour)**

The interviewer read my resume and asked me to introduce myself. After I gave my introduction, he went to the question.

**Question 1:** Count Possible Decoding of a given Digit Sequence

Let 1 represent 'A', 2 represents 'B', etc. Given a digit sequence, count the number of possible decoding of the given digit sequence. The question can be found [here](#).

I gave my approach using Dynamic Programming. He asked me to reduce the space complexity. I gave an approach like finding nth Fibonacci number. He was satisfied. Then, he asked me to generate all the possible decoding instead of counting them. I gave my approach using backtracking and he was satisfied.

**Question 2:** Identify the classes required to play chess game.

This was like a general question. I said four classes like – pieces, board, clock, player and game. He asked me to identify the attributes and functions of each of the class and how they interact with each other. I told them. He was satisfied.

Finally, he asked me if I had any questions for him. I asked him a few questions and we were done.

That was all for the interviews.

#### **General Tips:**

Don't be nervous when speaking to the interviewer. And don't think for a long time. Speak out your thoughts so that they can help if you go wrong. Preparing from GeeksforGeeks helps a lot.

#### **Best of Luck!**

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Amazon

## **Amazon Interview Experience | Set 304 (On-Campus for Internship)**

Eligibility Criteria: CGPA >= 5.0

### **Round 1: Technical Test**

An online test held on HackerRank which consists of 20 MCQ's and 2 coding questions.

- Coding Question 1: [Find a tour that visits all the stations](#)
- Coding Question 2: An array consists of 0's and 1's. A flip operation is one in which you turn 1 ? 0 and a 0 ? 1. You have to do a "Flip" operation at most once on a sub array. Then finally display the maximum number of 1 you can have in the array after one flip operation.  
In both the questions brute force solutions were accepted, i.e O(n^2).

### **MCQ's**

They were pretty simple you just need to have basic knowledge about Scheduling Algorithms, Threads and Time Complexity. In this section major portion was from the Operating Systems.

I would suggest you go through [last minute notes on OS](#), they were life savior for me in Online round as well as in further round.

We were told that there will be only 2 Technical Rounds and No HR round.

### Face to Face Round 1: (~1 hour)

#### ■ Questions 1: Fold a LinkedList :

1->2->3->4->5->6 is converted to 1->6->2->5->3->4

#### My approach :

- Step 1: Find the middle of the link list.
- Step 2: Reverse the second half of the link list and keep the head as head2 for the second half of the linklist.

First Half

1->2->3

Second Half after reversal

6->5->4

Now traverse both the halves simultaneously and then take a node from first list and then from second list, do this until you reach the end of first and second list and make new links and maintaining the links to the next Node. Asked me to cover all corner cases.

Finally asked me to give a proper working code on paper.

#### ■ Question 2:

If one of the nodes in BST is not in correct position place that in correct position in the bst. First by some observation I figured out that there will be 2 nodes which will be in wrong order.

So this question became similar to Two nodes of a bst are swapped ,correct the bst. I gave an in order traversal approach but missed some corner cases, after giving a few he told me I am missing some more test cases, then he moved to next question.

#### ■ Question 3:

A music player has N songs , you have a random number generator rand(n) which generates a number from [0,n-1] . Your task is to play a random song from given N songs such that each song is played once and your program should terminate once you have played all the songs.

#### ■ Approach 1:

We will use a HashMap to store the index of the song played and then whenever a random song is played check its occurrence in the HashMap if it is already there generate a random number again and do this till the size of the HashMap is N.

He told me that is a buggy code, and asked me to find out the bug.

The problem with the code is that it might end in an infinite loop in the worst case, assume that the first time rand(n) generates a number k (k<n) and we put that in the hashmap , now assume every time the rand(n) generates k so we will end into an infinite loop and our program might never terminate. After a lot of thinking, I couldn't come up with a good approach.

Hint given by interviewer: What if you can swap some of the songs?

#### ■ Approach 2:

Step 1: Take a variable last initialize it to N.

Step 2: Generate a random number using rand(last), let it be k.

Step 3: Swap(a[last-1],a[k])

Step 4: last--;

Step 5: Goto Step 2 till all the songs are played(last!=0) By the last variable I simply keep track of all the songs that are played(after last).

He was satisfied with the approach.

Round 1 was over.

### Face to Face Round 2 (~1.5 hour)

#### ■ Question 1:

He started with [graphs](#) asked to find the followers of a person told him to do a [bfs](#) and some basic questions related to bfs.

#### ■ Question 2: Clone a LinkList with random pointers.

Gave him a solution using Hash Map, he was not satisfied asked me to do in O(1) extra space.

I thought for 20 minutes but couldn't come with the O(1) approach.

Hint given by interviewer: What if you change some links in the original list?

Again thought for about 10 minutes still couldn't come with an O(1) approach.

Then he asked me to code the HashMap approach, while coding I figured out the approach with O(1) extra space. Once I was done with the code I told him the other approach, he was satisfied, code wasn't required for the second approach.

#### ■ Question 3: If you have 2 very big numbers how will you add them? Told him BigInteger is there in Java use that.

I : No without using that.

Take two strings and simply convert every character to digit and then add them up.

I: No you don't have to convert a character to a digit.

Take 2 arrays.

I: Tell the constraints with the array.

Then I finally told him to use a LinkList.

And then finally told me the approach to add them without reversing the list.(Did by recursion)

#### ■ Then there were many small questions related to quick sort, heaps, hashing, time complexity for various algorithms.

What are different phases in Compiler?

I never expected that!

I thought for about 2 minutes and tried to collect as much as possible whatever I have read in Compiler design. Then I gave him 4 phases of Compiler: Lexical Analyzer, Syntax Analyzer, Semantic Analyzer, Intermediate Code generation and then told him that I don't remember anything more than this since I haven't prepared CD and studied a long time ago.

#### ■ Then he asked me questions from OS.

What is Threading?

Why thread better than process?

What is thrashing?

What is LRU?

And some more basic questions on OS.

That was all for the interview.

Result: Selected 😊

#### Best of Luck to all of geeks for their placement season!!

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## Amazon Interview Experience | Set 303 (On-Campus)

### Round 0: (Written): 20 MCQs + 2 Coding Questions

MCQs – Topics: OS ,DS ,DBMS – (Serialization etc.), Aptitude (simple puzzle kind.)

Coding Questions:

- Given a string output reverse string (string could have multiple spaces between the words).

Example:

i/p: I am a proud Indian.

o/p:

Indian proud a am I.

- Given a no in string format output another string which is the biggest no formed from using same digits , otherwise print -1:

```
i/p:  
0000  
132  
4312  
11  
o/p:  
0  
321  
432  
-1
```

So the solution is : <http://stackoverflow.com/questions/12493591/given-an-array-of-integers-find-the-largest-number-using-the-digits-of-the-array>

### DAY 2: (Interview Rounds)

#### Round 1 (Technical Interview – 45 min approx.)

The Interview started with his introduction , what his department is , what do they do and so on.

- Given a link list of 0's and 1's sort it so that all the 0's are at beginning and 1's at the end. It had to be in-place.

You cannot swap values only pointers.Order of 0's and 1's was to be maintained . I had to write production level code for this with all boundary conditions checked!

- Given an array of 0's and 1's again and a variable k , print the size of the smallest window which contains exact k 0's .
  - discussion about the best optimised approach .
  - I solved it by storing indexes of all 0's and calculating min diff b/w every k elements.

#### Round 2 (Technical Interview – 1 hr approx.)

The interviewer asked me to introduce myself and then my projects.

- A person has to cross a road and with each step he either gains some energy or loses some (this info is provided as an array) . Find out the min amount of energy he should start with so that at any level his energy is not less than 1 ).

Simple question done in O(n).

- How to solve  $(a \cdot b) \% m$  , where all a,b,m are of the order  $10^{15}$ . Modulo's distributive property is one thing .

1st approach suggested was breaking the no's to binary as solving for eg:- [ (  $2^5 + 2^3 + 2^0$  ) \* (  $2^5$  ) ] % [ (  $2^3 + 2^2 + 2^0$  ) ] is feasible, but he wanted faster approach.

I suggested O(lg b) approach using divide n conquer (recursive solution) .

- He asked me if I know about the data structure Tier , I had heard about it and its use but never implemented it. He explained a briefly what it is , then told me to code its structure , its functioning (finding / adding a new word) .

Then asked a few questions on it , some cases where it will falter , some more discussion on it.

### Thanks Geeks ! Result – Selected

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# Amazon Interview Experience | Set 302 (On-Campus)

0th Round: (Online): 20 MCQs + 2 Coding Questions:

MCQs Topics: OS Page fault, Waiting time (RR Scheduling), Paging, Semaphores, etc.

DS : Hashing (simple chaining based numerical)

Aptitude : 1 Probability question, Puzzle: 1 question, C: 2 questions, etc.

There were 4 rounds of interviews(all technical). Each round was for 45-50 minutes.

### 1st Round:

In this round the interviewer asked me the below two questions.

1.a) Given a number find the next greater number with the same set of digits. (<http://www.geeksforgeeks.org/find-next-greater-number-set-digits/>)

I had to write the complete code covering all the edge cases.

Since I had practiced this question, it didn't take much time to code for it.

1.b) Given a Binary Tree, convert this to a tree where each node contains the sum of the left and right sub trees in the original tree. (<http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>)

For this question, first I discussed the approach, confirmed the edge cases and then wrote the code using recursion.

### 2nd Round:

This round started with questions from Operating Systems.

The interviewer asked me questions on Process and Threads, Process Scheduling, Mutex and Semaphores and Memory Management.

Some of the questions that were asked:

- a) Difference between process and thread.
- b) Advantages and disadvantages of using threads.
- c) Difference b/w Scheduler and Dispatcher.
- d) Name all the process scheduling algos and explain the Round Robin Process Scheduling.
- e) At max how many threads can be active at a time in a machine?
- f) What is race condition and how do we avoid it?
- g) Difference between Semaphores and Mutex?
- h) What is secondary memory and why do we use it?
- i) What is thrashing?

Then he asked me questions on Computer Networks.

a) Explain OSI reference model and write all the layers present in this model along with the protocols used at each layer.

b) Difference between TCP and UDP.

Finally he gave me a problem and told me to first discuss the approach with him and then code the same covering all the edge cases.

The problem was as follows:

You are given an infinite stream of numbers, at any instant of time you have to print the earliest non-repeating number.

eg: 2 3 4 2 5 6 output 3

2 3 4 2 3 7 8 output 4

I discussed my approach with him, he told me to further increase the efficiency and gave me hints.

With his hints, I came up with the final solution (using Doubly Linked List and HashMap) and wrote the code.

He evaluated it and spotted 3 errors.

### 3rd Round:

In this round the interviewer asked me questions on the Internship project.

He told me to briefly explain the complete project and asked various questions on the same.

Then he gave me a coding question and asked me to first explain the approach and then code.

The question was,

You are given an infinite stream of numbers and an integer k, at any instant of time you have to print the top k elements scanned till that point.

I explained the naive approach of using an array of size k and then inserting the elements at proper position thus making sure that the array always remained sorted. Complexity O(k)

He was not satisfied with this solution and told me to further improve it ie aim for O(log(k)).

I did some brainstorm for a while and then gave the final solution to him using a min heap of size k.

He also asked me to write down complete code for min heap.

The next question was on Caches.

He asked me to tell different page replacement policies.

Then he asked me, "How would you implement LRU Cache"?

I told him that it can be implemented using Priority Queue.

Then he cross-questioned me on Priority Queues, its internal implementation and complexities.

He didn't ask to code for it.

### 4th Round:

The interviewer gave me 45 minutes to solve the below coding problem.

You are given an infinite stream of numbers, at any instant of time you have to print the median of the elements scanned till that time.

Median of an array here refers to the middle element of the array after sorting.

First I told him that I would maintain a sorted array, thus order of insertion would be O(N) and order of query would be O(1).

He told me to further optimize it.

I thought of using heaps and somehow try to achieve O(log(N)) for both insertion and query, but then he told me that it can be further optimized.

He told me to aim for O(log(N)) and O(1) for insertion and query respectively.

Suddenly I got the idea that I could make use of a minheap and a maxheap to solve the problem.

I discussed my approach with him. He was impressed.

Finally I coded the problem.

At last he asked me, "Given an inorder traversal of a BST, can u build the tree"?

I told him yes. Then he asked me, "How many such trees are possible"?

I knew answer to this question, as it was taught in the class.

I told him about Catalan Number.

Verdict: 3 selected out of 33 interviewed.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 301(On-Campus for Internship+ FTE)

Round 0: (Written): 20 MCQs + 2 Coding Questions:

### MCQs – Topics:

- OS – Page fault, Waiting time (RR Scheduling), Paging, Semaphores, etc.
- DS – Hashing (simple chaining based numerical)
- Aptitude – 1 Probability question, Puzzle – 1 question, C– 2 questions, etc.

### Coding Questions:

1. Given a list of n strings group all anagrams together

Example:

i/p: cat act pat mad dog god

o/p:

cat act

pat

mad

dog god

2. Given a binary square matrix of size n, find the size of largest region i.e. find a region of connected ones (horizontally, diagonally, vertically). Example:

i/p:

0 1 0 0

1 1 1 0

0 0 1 0

1 0 0 0

o/p: 5

### DAY 2: (Interview Rounds)

#### Round 1 (Technical Interview – 1 hr. approx.)

The Interview started with the interviewer telling me that we don't have much time so he will ask few questions on data structures and algorithms and I will need to tell him the approach.

1. Reverse a linked list.

- I gave two approaches, one using stack and one using pointers (in-place).

2. Print top view of a binary tree.

- Well simple question but don't know why I started using DFS approach (Pre-Order Traversal)
- Tried using pre-order but he gave me test cases where it failed.
- Tried different approaches within pre-order found issues with one or the other test cases and I was also using HashMap to keep track of nodes to print.
- So he asked me to do it without auxiliary storage.
- I tried level order approach (w/o auxiliary HashMap)and it worked fine for all test cases.
- He was satisfied with the approach, so asked me to write production level code.

#### Round 2 (Technical Interview – 45mins. approx.)

The interviewer introduced himself briefly and asked me to introduce myself. No follow up questions from the introduction (although I was hoping something on projects or company :P).

1. Find Kth Max occurring element in the Array.

- Used HashMap and Heap to solve the question.
  - Time O(n<sup>2</sup>logn)
2. DP question: <http://www.geeksforgeeks.org/how-to-print-maximum-number-of-a-using-given-four-keys/>

### **Round 3 (Technical Interview – 45 mins. approx.)**

The interviewer introduced himself briefly and asked me to introduce myself. No follow up questions from the introduction again.

He gave me a string based question and asked me if I knew it already (which I didn't), so he asked me to come up with an approach.

- Given a string find a repeating substring of maximum length.

Example:

i/p 1: banana

o/p 1: ana

i/p 2: indiaindianttindiaindia

o/p 2: india india

I thought of using KMP but complexity was high with this approach. I tried using Longest Common Substring to see if there is any pattern or way to solve it using LCS, I found an approach told it to the interviewer he was very happy with the approach.

### **Round 4 (Technical Interview – 25mins. approx.)**

Short round as it was my last round.

Only one question:

- Given an infinite integer number line, find minimum steps required to reach a particular point. 0 is the starting point and at i<sup>th</sup> step we can move +i or -i steps from current position.
- Tried using tree and realised it is DP problem told him the approach and complexity and why DP and why BFS (to get minimum steps). He was satisfied with the approach.

ALL THE BEST :):)

Thanks **GeeksforGeeks** for all the material, it helped me a lot during preparations. Keep it up !!

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Interview Experiences  
Amazon

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## **Amazon Interview Experience | Set 300 (On-Campus for Internship)**

### **1. Written Round**

20 MCQ from simple data structures, Networking, DBMS and some maths.

2 coding questions.

A) Interval merging problem. (<http://www.geeksforgeeks.org/merging-intervals/> )

B) Finding the diameter and printing the path of a binary tree from one end to other. If there are more than one diameter then print the one which is lexicographical small.

### **2. Technical Interview 1**

A) Discussed the second problem of the written round.

Asked me to code it.

B) Implement a circular queue using 1-D array.

Handle all the case like condition for full, empty. Write push, pop, isEmpty function.

C) Given three arrays. Find all the pair from the two array such that the sum of those element is in the third array.

### **3. Technical Interview 2**

A) Given the preorder and the inorder traversal of a binary tree. Construct the tree.

B) Now he said if the tree is binary search tree how you'll solve. Asked me to optimize as much as possible

### **4. Technical Interview 3**

A) Asked me about my projects. Asked me about problem in that. Asked me to solve those problems.

B) There is a file in secondary storage consisting name, address, phone and many other details. Now sort that file on the basis of phone no. Constraints: I have very low memory. I can't bring all the content of file to main memory. Using indexing I have to solve that problem. I gave k-way merging approach. Now asked me to do in a different way. He gave me hint for bst. Told me to write the code.

### **5. Technical Interview 4**

A) You have an infinite number coming to you. Device an algorithm to get the minimum at that time. Solved using two stack. Asked me write proper code, handle all corner cases.

B) Given the marks of a class in BST.

Subtract 5 marks from even ranked student. Asked me to code.

C) Questions from OS, threading.

And many more questions, some I don't remember.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

# Amazon Interview Experience | Set 299 (On-Campus for Internship)

AMAZON came to our college for both FTE's and two month summer interns.

**The First Round** was an Online Coding Round along with MCQ's. Remember to attempt some MCQ's correctly in order to improve your chances in getting through this round as the Coding questions may not be very difficult.

Q1. Find the next greatest number using digits for a given number. STL usage is allowed!

Q2. In a given array A find the maximum value of  $|A_i - i| - |A_j - j|$  where  $i \neq j$ . This is pretty simple!

MCQ's were standard and were from permutation and combination and probability mostly. Also outputs for code snippet.

There is a 5:1 selection ratio here.

### The Second Round : Face 2 Face Interview 1

Asked for the favorite data structure and questions on them. I answered trees and linked list.

So, the questions were from the basics of trees.

Q1. Check if a given binary tree is a Binary Search Tree.

Then questions stemmed out from the in-order successor part and the in-order successor had to be coded with and without using the parent pointer.

Q2. Implement Stack using Arrays Linked Lists and Queues. And comment on their advantages and disadvantages.

Q3. Implement Queues using Stacks and comment on the complexity.

Questions were simple enough but code was required.

20 people out of 31 were selected.

### The Third Round : F2F Interview 2

A different interviewer in the same setting.

Found the questions to be of higher standard compared to the previous round and more time consuming.

Q1. Maintain the First Non-Repeating character in a stream of incoming and outgoing characters or digits simply in O(1).

Gave some solutions for O(n) at a particular instant of time.

But used a Hash and Queue but that did not allow maintaining the first non-repeating character as the elements could not be accessed randomly.

There were a lot of hints and finally I understood that the interviewer was hinting at a deque where the hash value is the node pointer in deque.

I just had to sum up the small things and give a final solution with all the bits and pieces arranged.

Not Very Satisfactory.

Q2. Cloning of a Binary tree with random pointer:

Did the cloning of the normal binary tree but could not do it for the random pointers because I need the links and paths.

Gave a O(nlogn) solution storing all the paths from the node to its random pointer node.

Finally, I came up with a Hash Map Solution which seemed fine.

The interviewer told me to practice more questions and increase the depth of knowledge in Data Structures.

This was all for the interview!

Though the questions were not common for me, these are standard questions and can be found in gfg.

But somehow I kept thinking and collected the hints for the answer and summed it up.

I thank the huge amount of online resource that is available for learning and practice, especially geeksforgeeks.org.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

# Amazon Interview Experience | Set 298 (On-Campus for SDE-1)

Recently Amazon came to our campus for placement (SDE-1).

I want to share my experience.

Round-1

20 MCQs many from GeeksQuiz and 2 coding questions.

1. Find a range in array of bits(0 and 1) such that by flipping it, the count of 1's in complete array becomes maximum.

2. <http://www.geeksforgeeks.org/find-a-tour-that-visits-all-stations/>

#### Interview-1

Brief introduction.

Two coding ques. were asked:

1. Clone a link list with random pointers.

2. In an array of +ve integers, all numbers are occurring even no. of times expect one. find it.

#### Interview-2

Two coding ques. were asked:

1. find the largest palindromic substring.

2. Merge 2 binary trees to make a binary tree.(Solved using conversion of binary tree to Doubly linklist and then merge two DLLs and then convert DLL to Binary tree.)

#### Interview-3

Brief introduction.

Discussion on projects. They focused on team projects.

Then gave a situation: n no. of vendors and m no. of warehouses(n , m very large). We have to shift the products from vendors to warehouse and then from warehouse to customers. Aim is to fasten the product delivery and reduce the cost to company.

In this we had to make assumptions and make cases.

#### Interview-4

Brief introduction(Only technical one).

Two coding ques. were asked:

1. 2 sorted arrays of size m and n ( $m > n$ ) are given. There are  $n$  empty spaces at the end of the array1. Make the array1 consisting/merging the elements from both the arrays and store it in array1.

2. Connect siblings at same level in binary tree.

What do you mean by time complexity(in depth)?

Concepts of OS like virtual memory, paging, page fault were asked.

Other ques. asked to other people:

1. BST two nodes swapped. correct them.

2. Square root of no. (correct to 2 decimal places).

3. Diameter of the binary tree.

4. Add 1 to a number represented by link list.

5. largest substring having unique elements.

6. Diff. b/w process and thread (in detail).

7. Coin change problem.

I want to thank geeksforgeeks.org for its content.

I got selected because of it.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 297 (On-Campus for SDE)

Amazon visited our campus on 12th August. There were 5 rounds namely –

1) Written round

2) – 5) All technical rounds with increasing difficulty levels

The written round consisted of 20 mcqs ( OS, DBMS, CPP , C , JAVA and Aptitude basic level ) and two Hacker Rank coding questions –

1) Overlapping subsets problem and

2) The longest path in a given binary tree

The technical rounds took 1 hour each.

In the first technical round I was asked to check whether a given tree is a complete binary tree or not and then to code both recursive and non-recursive version of it. It also included another question like to find whether a number is a power of 2 or not.

The 2nd technical round had questions like what is a symmetric number, how will you check if its a symmetric number. And then he asked me to find all the symmetric numbers of given n-digits. I wasn't able to do the last part.

The 3rd technical round consisted of a string compression problem. Given a string like AAABBBCDEFGHIJKLMNOPQRSTUVWXYZ – you have to compress it to a string like A3B3C1D1E1F1G1H1K1L15. The question was to be done in O(n) and inplace.

The 4th technical round consisted of the popular dynamic programming problem of cutting sticks of various length and merging them to form a bigger stick keeping in mind that you have to decrease the overall cost of merging.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 296 (On Campus for Internship)

### Online round (1 hour 30 min)

20 MCQs + 2 coding questions-

- 1) Given an expression string exp, write a program to examine whether the pairs and the orders of "(" and ")" are correct in syntax
- 2) Given preorder and inorder traversal of a binary tree, print preorder and inorder of the tree after modifying it such that each node stores the sum of its left and right subtree.  
(building the tree was not required)

### Technical round 1 ( 1hr 30 min ) F2F

- 1) Given a string of characters find the first non repeating character.

did it with hashing.

He asked me to do it using one loop. I did it by taking two pointers.

- 2) Given a list of vehicles group vehicles by their property.

All vehicles with same production year and other parameters are to be grouped together.

He asked me to write object oriented code.

I did it with list of lists.

Then He asked me to modify the code considering the production year and other parameters as objects and not just integer or string variables.

He was looking for some better method for comparison of two vehicles . I did it operator overloading inside the vehicle class.

### Technical round 2 (1 hour 30 min ) F2F

1. Given two numbers return the sum of the two numbers considering all the cases(like integer overflow, underflow etc).

2. Given array of elements denoting price of some objects, print the maximum sum that can be obtained following some constraints-

i)only one of the two ends from the array can be selected at a time

ii)the seller can sell only one item per day

iii)the value of each of the elements gets multiplies by the number of days passed.

I did it with dynamic programming.

3. Print next greater palindrome of a given array with each element denoting a single digit of an integer.

4. Connect nodes at same level with O(1) extra space.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

# Amazon Interview Experience | Set 295 (On Campus)

Amazon visited our campus for FTE's (Full Time Employees). Interview process started with an online coding round followed by 4 face to face interviews. The level of difficulty increased as we move to the further rounds. All interview rounds started with brief introduction about me.

### Online Round:

A hackerank contest with 22 questions inclusive of 2 coding problems and 20 MCQ's on C, OS, DBMS, Networking.

The 20 MCQ's are mainly based on Algorithm analysis for example time complexity space complexity for a particular snippet of code, basic C, java output based questions, OS Mutex ,semaphores, IPC, synchronisation etc..

Here are some of the questions i remember

1. Which of the following sorting algorithms have worst case  $n \log n$  complexity?

Ans:merge sort,heap sort.

2. Time to insert an node after a given node in a linked list?

Ans: $O(1)$ .

3. Number of child process created when fork() system call is called n times?

Ans: $2^n - 1$ (i guess).

4. Int arr[5]={1,2}, cout<<a[2]<<a[3]<<a[4]; . . what is the output of the following snippet? Ans:0,0,0.

5. The average time taken for searching an element in an array using linear search assuming that the searched element is always present in the array?  
Ans:  $(n+1)/2$ .

6. You will be given array ,you have to find out which of them represents a max/min heap?

7. You are two traversals of a binary tree,,you have to find out the asked traversal? For ex: Inorder=4, 8, 10, 12, 14, 20, 22. Level order=20, 8, 22, 4, 12, 10, 14  
Find preoder? Ans:20,8,4,12,10,14,22

8. You are given a binary search tree and a key time taken for the Searching given key? Ans: $O(\log(n))$  worst case for balanced BST  $O(n)$  worst case for Normal BST (this case occurs for left/right skewed trees).

#### Coding Questions :

1. You are given a array of positive integers which represents heights of buildings.Width of each building is assumed to be 1. You have to find max rectangle area of buildings.

**Ans:** <http://www.geeksforgeeks.org/largest-rectangle-under-histogram/>

2. You are given a string let say "saideep",s-1,a-1,i-1,e-2,d-1,p-1 is the frequency of each character.VALUE of the string is defined as sum of squares of count of each distinct character.value of above string is  $1+1+1+1+4=8$ ; Your task is to minimize the strings VALUE of the string after removal of 'k' characters.

**Ans:** Its a straight forward question where you take a 256 array to store frequency of each character ,for k times you find a maximum frequency character and decrements its frequency by 1. After k iterations print the VALUE function you get by remaining characters.

#### F2F 1 ( 1 hr 30 min, TECHNICAL ) :

Interviewer is a lady, probably 3-4 years senior to me. She asked me two coding Questions:

1. You are given a binary tree ,you have to print extreme nodes of it.? Give me an algorithm that is robust,works fine for all cases,explain the space complexity and time complexity of your algorithm?

For Example:

```
1
 / \
2 3
 / \ \
4 5 8
   / \
  6 7
```

**Output:** ( 1 2 8 6 ) or ( 1 3 4 7 )

**Ans:** It is just a modification of level order traversal,keep track of a Boolean flag variable and flip it after each iteration. She then asked me write complete code neatly.

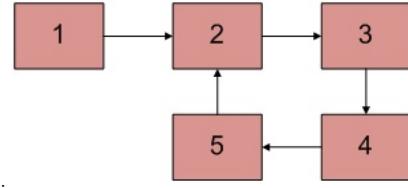
2. You will be given two linked lists that consists of digits 0-9 only in each node. Each linked list represents a Number ,you have to add two numbers represented by a linked list?

For Ex:

```
Input:
First List: 5->6->3 // represents number 365
Second List: 8->4->2 // represents number 248
Output
Resultant list: 3->1->6 // represents number 613
```

I said I already know that question she skipped to the next question

**Ans:** <http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>



**Ans:**

3. You will be given a linked list that contains loop inside it,if exists detect it and remove it?For Example:

First I gave a hashing kinda solution that works for sure for all the cases. The idea is that whenever I see a node I make a lookup in the hashtable to see whether it exists in the table already or not, if exists then there is a loop and I make that node ==NULL.

Else I will insert that node in hash table and move to the next node.

She was ok with that solution but it required O(n) space of hash table, so she asked me to do in O(n) time and O(1) space.

Then I got that 2 pointer method ([floyds cycle detection algo](#)), so I gave that method, by this method we can detect a loop easily, but removing it requires some mathematics(related to kinematics in 1-D).

She then asked me write complete code neatly.

#### F2F 2 ( 1hr 30 min TECHNICAL ) :

He gave me two coding questions

1. You are given a string with distinct characters and you have to print all the permutations of it?

For ex: **Input:**"AB"

**Output:** AB,BA

Its a straight forward question and I gave him an back tracking approach and he asked me to explain how that backtracking works using an example. I explained him by taking various examples that involves corner cases and made sure that it works for all the cases. He then asked me write complete code neatly.

**Ans:** <http://www.geeksforgeeks.org/write-a-c-program-to-print-all-permutations-of-a-given-string/>

2. You are given a maze which describes the way for a goat to reach its house. Maze is usually a M\*N grid consisting of only 0's and 1's . Goat initially is at (0,0) point in the maze and it has to reach point(M-1,N-1). The only possible move the goat can make is go RIGHT,DOWN,RIGHT-DOWN(DIAGONAL) i.e from a point (i,j) goat can move to(i+1,j) or(i,j+1) or (i+1,j+1) point. Goat can make only one step at a time. Your task is to find number of such paths for the goat to reach its house.

Point (0,0) and point(M-1,N-1) are obviously 1. A 1 indicates that the point can be used and 0 indicates that the point is blocked in the sense we cannot go to the point at any cost.

**Ans:** I gave him a recursive solution initially and explained him about the drawbacks of that solution, that it takes exponential time to solve that problem.

I then explained how I can use Dynamic programming to solve this problem and gave him a DP solution. He was very much impressed with my solution and asked me the time and space complexities of that solution. He then asked me write complete code neatly.

#### F2F 3 ( 1hr TECHNICAL ) :

The interviewer went through my resume and my previous interview rounds performance and said introduce yourself. I introduced myself: He asked me if I had done any internships. I said no sir, i got chance in some of the companies but i didn't take it. He then asked me what did you learn in this summer ,I said I prepared for the placements and I've done 1-2 mini projects.

He then asked me why didn't you take that interns. I told him i don't like those companies hiring process itself how can i work in the company.I said that they all asked memorizing concepts which i am very weak in and didn't even ask me single logical question.he even didn't ask me single coding question.

He said lets start our process you are here because of your coding skills, but in this round I am gonna ask you theoretical questions.

He asked me

1. Difference between trigger and stored procedure?
2. Difference between **thread and process**?
3. Define deadlock and race condition?
4. How **deadlock is detected**?
5. What is resource allocation graph and how its related to deadlock,what are the nodes in that graph?
6. He asked me what all the data structures i know and give their real time examples?
7. **Indexing in DBMS**
8. Types of indexes
9. How indexing is done in DB(b-tree and b+trees)
10. Views ,types of views its advantages

He then gave me a coding question: You have to replace every element of an array with its immediate smaller element to the right. If such an element doesn't exist don't replace it.

**Ans:** I gave him a stack solution which he was very much satisfied and asked me to code taking care of corner cases. He then asked me write complete code neatly. He is satisfied with my code and asked me to wait outside for further round.

#### F2F 4 ( HR+TECHNICAL ) :

He started by asking me to introduce myself and gave a coding question.It's the tough question

You will be given a floor say( $m \times n$ ) dimensions and sub rectangles that can fit inside the big rectangle..you have to print the floor plan for given dimensions of small sub rectangles.

He explained me that it requires construction of SLICING TREE and then printing floor plan. He asked which all the data structures you will use to construct it and asked me think of it.

**Ans:** I gave him an stack/queue based approach .I told him that i'll sort the sub rectangles by lengths/breadths and push them in stack in d=increasing order ..he was very much satisfied with my algorithm and asked me to code it.I coded it completely and showed him . .I just solved the problem and i didn't print the floor plan which is our actual problem. .i then implemented the print function inside it.

He said that he's done with the interview and asked me if any queries.

I asked him about the kinda of project he's currently working and some casual discussion on technologies.

PS:- Everyone knows the algorithm but it's implementation with robust,clean code is required which covers all test cases.they will certainly give corner cases that our code fails to execute so make sure you write a universal code.Make sure you ask any doubts if any to clarify the given question/scenario.The interviewers are a lot helpful and they give you hints if you are struck.

Thanks **GeeksforGeeks** . .It helped me a lot in my preparation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 294 (Experienced)

### Round 1

1. Pivoted array search, modified that array can have duplicate values need to return first occurrence of element.
2. Is pair of given values present in BST or not?

### Round 2

1. In FB when we enter person name to search then their are multiple name FB gives us as a suggestion. Design a DS for showing these name.(gives him **trie** DS solution)
2. Behavioral Questions
  1. Things u learn in 3 years of experience which makes u different from fresher guy?
  2. Project description

### Round 3

1. **LCA** in binary tree. Both elements parent must not be equal to given elements.
2. Check if pair is present in array or not. modified to return all unique pair in it.
3. Integer stream is coming find largest K element.(K is fixed)
4. Design a DS where below operation is performed in O(1) time.

1. Insert
2. Delete
3. Search
4. GetRandom

#### Round 4

1. Lot of discussion on projects. HLD and LLD of project.
2. There is file of million number you have to find out largest k element.
3. Give all pair present in array. Duplicate can be present in it.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

## Amazon Interview Experience | Set 293 (On-Campus)

**Round 1(Online Test)** It consisted of two coding questions and 20 MCQs. **Round 2(Technical Interview)**

1. Write a function to find 'a' raised to the power 'n'. Then he asked me to find the time complexity of the function.
2. He was about to ask me the question of 'finding the number of islands' - <http://www.geeksforgeeks.org/find-number-of-islands/> but I told him that I already know the solution so he moved to the next question.
3. There are n boxes given that are 1-D. You have to find the best fit for the given item that can fit into the box. For ex- An array of boxes is given as {7,9,12} and we need to find the best match for the item of size 10 then the box with dimension 12 will be our best match. I suggested him to use BST. We can arrange all the boxes in a BST and find the successor for the given item in the BST. He then asked me to code it.
4. He then asked me about my project.

#### Round 3(Technical Interview)

1. He asked me a question of joining strings which is similar to the below question – <http://www.geeksforgeeks.org/connect-n-ropes-minimum-cost/> I suggested the same approach and coded it. He was satisfied.
2. There is a audio player given which picks up a random song from the playlist and plays it. The song should not be repeated until all songs are played atleast once. The sequence number of the songs are given in an array. Design such audio player without using any extra space. I suggested him to use a pointer say 'pivot' that initially points to the last element of array. The songs to the left of the array are not yet played and the songs to the right are already played and cannot be repeated. Each time a song is picked form left of the pivot and played. That song is then replaced with the pivot element and pivot is moved left by one position. If the pivot points to the first element that means all songs have been played once and the pivot again moves to the rightmost element.

**Round 4(HR+Technical)** He asked me some HR questions for about half an hour. After that he shifted to the technical part.

1. What all data structures you know. Give the real life examples of when can we use them.
2. Write a code for preorder traversal of a binary tree without recursion.

#### Round 5(Technical Interview)

1. Flattening of a binary tree – <http://qa.geeksforgeeks.org/3976/flattening-a-binary-tree> I coded it correctly and she moved to the next question.
2. A boolean matrix question – <http://www.geeksforgeeks.org/a-boolean-matrix-question/> I already knew the question so she just asked me to code it.
3. An array of strings is given in which some strings are anagrams of one another. You have to find those strings and store indexes of those strings in a vector. I suggested to sort all the strings and then use a hashmap<String, vector> to solve the above question. She asked me to code it.

And yay!! I got selected :p

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 292 (On-Campus for Internship)

Amazon came to our campus for hiring interns. At first there was a coding round then 2 personal interviews

**Coding round:** There was 20 mcq questions based on DS , OS , IQ and output questions

And there were 2 coding questions

1. Given a string print the lexicographically smallest possible rotation of the string.  
(N square sol. Passed)

## 2. Balanced parenthesis

I did bith coding questions and attempted 17 mcq and got selected for next round

Out of 500 ,47 were shortlisted

### 2nd round:(Personal interview)

First he asked me about myself then he gave me a question

1. suppose there is a matrix filled with zeros and ones then find if there is a path between (0,0) to (n-1,m-1 )

I explained my approach(trivial dfs) Then he asked me to write a code for printing all possible pathsI implemented it using backtracking

2. Game of nim

3. Number of all possible bst for keys 1 to n

4. number of all possible labeled binary trees for given n nodes

5. <http://www.geeksforgeeks.org/dynamic-programming-set-31-optimal-strategy-for-a-game/>

6. <http://www.geeksforgeeks.org/check-whether-a-given-string-is-an-interleaving-of-two-other-given-strings-set-2/>

24 students were shortlisted

### 3rd round:

- Design a data structure for a server which can store atmost 100 records, 2 functions are used to access server get(k) ,put(k,v,x).

Where k is key and v is corresponding value and x is the expiry time before which this record cant be removed

Implement a data structure to implement these function optimally. I implemented using self balancing bst and an unordered hash map

- Then he asked me to construct an avl tree for keys from 1 to n.

Cheers i got selected!!

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

## Amazon Interview Experience | Set 291 (On-Campus for SDE1)

Amazon visited our campus for SDE\_1. The entire interview procedure was divided into a coding round and a set of 4 face to face interview.

### Online coding round:

It was a 90 minutes test with 22 questions(20 MCQs + 2 coding) set hosted on HackerRank.

Coding questions:

1. Reverse words in a string.

Example: Let the input string be "i like this program very much". The function should change the string to "much very program this like i"  
<http://www.geeksforgeeks.org/reverse-words-in-a-given-string/>

2. Largest length of subarray with given sum.

<http://www.geeksforgeeks.org/find-subarray-with-given-sum/>

MCQs consisted of OS, Geometry, Basic Maths, C ,Recursion and such topics.

Whoever solved atleast two questions were chosen for the interviews.

### F2F 1(Technical):

He asked me about my Summer Internship Project at Microsoft India Development Centre, Hyderabad and asked me about several technologies involved in it and why I had used certain things.

Then he moved on to two technical questions.

1. Given a sorted and pivoted array, find an element given to you.

I had given him a O(logn) solution with pivot finding and then doing binary search in either halves. But it was a O(logn) + O(logn), so he asked me to modify it to a one O(logn) question. After giving him the solution, he asked me to write production level code considering all corner test cases.

2. Given a BST which consists of marks of students in a class. It is found that all even ranked students have cheated,so we reduce k marks from their score. Modify the BST to make the change of marks without considering that after this operation, the BST might not remain a BST anymore.

I gave him a modified inorder traversal so that elements are sorted and solved it using a counter variable. He asked me to modify it to using neither a static counter variable nor a pointer passed to the recursive calls. For both questions, he also asked me the time and space complexity.

### F2F 2(Technical):

He asked a very brief idea about my Summer Internship again. Then he asked me 2 questions again.

- 1.Given a k sized window in an array,find max element in each window.

<http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/>

I discussed a lot with him as to which data structure could be used and finally came up with a Queue solution. I was asked to code it again considering all the corner cases.

- 2.Implement a queue using stacks with the operations (Enqueue,Dequeue,IsEmpty,Size).

While I was telling him the solution, he even asked me whether I would prefer Arrays or Linked List implementation when I make a normal queue.

(Space and time complexity for both)

#### F2F 3(Technical):

He also asked me a brief introduction to my Summer Internship Project.

He began with the pros of cons or arrays and linked lists. Then a question on arrays:

- Given an array with all even elements present even number of times except one which is present odd number of times. Find that element.

I started with XOR solution, but he told me the OS doesn't support XOR. So, I gave him a HashMap solution. He went on asking me to optimize further. So at the end I had a space complexity of  $O(k)$  where  $k =$  number of unique elements.

Asked me the Space and Time complexity of the most optimized solution.

- Given four types of array

- a) Increasing(1,2,3,4)
- b) Decreasing(4,3,2,1)
- c) Increasing-decreasing(1,2,3,4,7,6,5)
- d) Decreasing-increasing(7,6,5,1,2,3,4)

Find the type of array in  $O(1)$  and then find the maximum element in the array.

Except case c, max element is  $O(1)$ . For c, I gave binary search solution. He asked me to write the code considering the corner cases.

#### F2F 4(Bar raiser):

He asked me what my favorite subject was. I told DS, so he asked me from DS.

- Write a class of circular queue using array implementation with Enqueue and Dequeue member functions.

- Given a binary matrix (filled with 0 and 1 only) where 0 depicts water and 1 depicts land. We can traverse either up or down or left or right. Given a source and destination, find if we can reach the destination.

He then modified it to finding the path followed and then the minimum path possible.

(Code wasn't required)

- Given a series of operations to build a project along with the time taken by each operation. Some operations are dependent on previous operations. Find the minimum number of days needed to finish the operation.

I wasn't very sure of the solution I was thinking, so he said it was okay and concluded the interview.

#### Tips:

- Keep sharing your idea with the interviewer, he would help you a lot.
- Don't give up, you might come up with a brilliant idea with a little more thinking.

And do remember:

"If it doesn't end well then it probably hasn't ended yet"

I would like to thank all my friends for all the support and a special thanks to GeeksForGeeks for their awesome website. Cheers!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 290 (On-Campus for Internship)

Recently, Amazon visited our campus and as a matter of fact it was the first to visit.

They took 3 rounds to select interns.

1st round – Online test

There were 20 MCQs, which included questions from C, C++, Java(Multi Threading) and few aptitude questions.

Then, there were 2 coding questions-

1)<http://quiz.geeksforgeeks.org/lexicographically-minimum-string-rotation/>

2) Given a string, check whether string is Good or Bad (Condition – String is composed of 'a' and 'b' characters only and you can add only "ab" anywhere in the string to form a Good string).

#### 2nd Round – F2F interview

Interviewer gave me one question – Count possible paths from top left

<http://www.geeksforgeeks.org/count-possible-paths-top-left-bottom-right-nxm-matrix/>

He first asked me to give recursive approach and then optimize it further by creating an extra matrix.

Finally, he asked me to give DP solution of the problem.

Interviewer was very helpful and discussed every step of my solution. He wanted to see how I approach the given problem and further optimize it gradually.

#### 3rd Round – F2F Interview

Interviewer started with my projects and slowly came to Operating system. He asked few questions related to it-

1) What is a page fault?

2) How does it affect the CPU performance?

3) How to minimize it? (I talked about LRU)

He asked me to design LRU using appropriate Data Structures.

I did it using doubly linked list and map. Then, he talked about complexity of my solution and wrapped up the interview by asking if I had any questions for him.

**Few advises** – First, be cool and don't be nervous because interviewer wants you to be interactive and confident. Think out loud and keep discussing with interviewer about any of your queries. Lastly, just memorising algorithms won't do any good. One has to learn the art of developing logic of a problem.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

### Amazon Interview Experience | Set 289 (On-Campus for Internship)

Amazon was the first company to visit our university this year. They have taken 3 rounds for selecting students for internship program.

**1. Online coding round :** This was as usual. 2 coding questions and 20 MCQs. MCQs were from probability, permutation, output, tree, DBMS and OS.

Coding questions were easy. The first one was finding-next-greater-element-with-same-set-of-digits. I've to implement the function long nextGreater(long n); There were hidden test cases. That means, if you submit successfully, then also your code might be wrong. You've to design and test your code.

Second question was easy, find max(|Ai - i| - |Aj - j|) from an array with i!=j.

There were students who were not selected just because they answered only 3 or 4 MCQs. Actually, the selection was not done based on the coding questions. Two of my friends answered both the coding questions and didn't answer any MCQ and were not selected.

**2. 2nd round was a F2F round.**

The interviewer was very frank, friendly and helpful as well.

At first he gave me the problem of finding triplets in an array that adds up to a given value. I told him that I've solved it before and he told me to explain the algorithm. I did.

Then he gave me another problem. Given a BST and a range, return all the elements in that range. I told him one recursive approach and I had to write the code on the paper. He told me that there are two bugs in the code, find it. Later I figured out and modified the code.

Then he gave me infix to postfix conversion and evaluation of postfix. I solved it but then he told me it was wrong. Then I've to find out what was wrong with my code. I took an example and debugged my code.

Then he gave me a chance to ask him questions if I had. I asked him, "How many hours do you code in a day?" He replied, "Sometimes I don't write code at all, sometimes it is 12-16 hours." He also mentioned that his wife doesn't like him. I told him, you should have married a CS girl. He was laughing. I asked some other questions and it was really an awesome conversation.

**3. 3rd round was HR round.** The interviewer started talking about the life and culture at amazon.

Then he asked me the problem of finding whether two nodes in a Binary tree

are cousins or not. I was not able to solve it at first. I was nervous. I wrote the code but again it was wrong, he told me you'll get 2 more minutes for 5 times. But he gave more than 10 minutes to solve it. Actually he was trying to confuse me.

2nd question was a math question, it was easy and then he told me to implement insert method of MaxHeap. I told him that I can't. I can use MaxHeap but I've never implemented MaxHeap. He said, "Then implement it now." I did and said, "Have you ever implemented MaxHeap insert method in O(1) time?" He just stared at me and then I said, "I don't like remembering algorithms that I don't even understand. And I never needed this algorithm as well".

Later I apologized for the arrogance that I showed. He asked me lot of questions like why do you want to work at amazon ? Then he gave me a chance to ask him questions. I asked the same question,

"How long do you code ?" He said, "I don't write codes at all." I said, "Why ?" He said, "Because I'm the HR manager" I said, "I thought that there will be one more round and that'll be the HR round.

And I heard that the HR manager likes to ask mathematical questions". He laughed and said, "I asked you one."

And one advice that I can give you is that You don't need to know thousands of algorithms. Apply your brain to develop them because they'll give you sufficient time to do that. Remembering algorithms is a bad habit. And be confident and proud of what you already know. Thanks geeksforgeeks for giving me such an unexpected happiness.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

### Amazon Interview Experience | Set 288 (On-Campus)

Amazon visited our campus for SDE-1 . Interview process started with an online coding round followed by 4 Face to Face Interviews. All Interview rounds started with

brief introduction about me.

#### **Online Round :**

A hackerank contest with 22 questions inclusive of 2 coding problems and 20 MCQ's on OS, DBMS, Networking and C/C++.

Coding Questions :

- Given a 2d array with only elements '#' & '.' . '#' represents cherry and '.' represents nothing . Can you divide the array into 2 halves with equal cherries . You can only make a single cut either horizontally or vertically .
- Sliding Window of size k . Find max of each window.(no need of optimization, Brute-Force was accepted).

#### **F2F 1 ( 1 hr 20 min, TECHNICAL ) :**

- Find floor of a number in a sorted array. Production code was required.

2. Given a number k , Find no. of ways to make this number using sum of numbers from 1 to k-1 . Constraints: You cannot take same number more than once in a combination( for eg: k=6, {1,1,4} can not be considered in solution) and also all permutations of a combination count as one way ( for eg: if k= 6, Then all permutations of (1,2,3) count as one way only). (Solution : Recursion, DP)

#### **F2F 2 ( 40 min, DIRECTOR + TECHNICAL ) :**

- Given an API :- bool isValidWord(string) and a list of sentences. For each word in a sentence, you have to print all the substrings and reversed substrings in that word which are valid (validity of a string is checked by above API).

2. Discussion on Egg Drop Puzzle.

3. What happens when you type [www.amazon.com](http://www.amazon.com) in your Browser .

#### **F2F 3 ( 1hr , TECHNICAL ) :**

- Given a linked list, write a function to reverse every alternate k nodes. Need to handle all the Corner cases .

2. Given millions of sorted lists and a God Processor that can work on infinite threads at a time, make a sorted list using all the elements of given lists considering the advantage provided by such a processor.

(My approach 1: use Priority Queue, but he said that only one thread can use the PQ at a time.

My approach 2: use technique similar to Merge Sort) .

#### **F2F 4 ( 1 hr 20 min, TECHNICAL ) :**

- Given a robot which is on Origin in a number line and a string that contains either 'L' , 'R' or '?'. 'L' means turn left and 'R' means turn right. '?' can be assumed to be 'L' or 'R'. Find the maximum distance from origin the robot can go at any point of time. ( My approach 1: Backtracking, 2: Backtracking+Memoization, 3: using two variables )

2. Discussion on data structure used for dictionary, Hash table vs Trie, collision handling in hash tables.

Print all the substrings of a given string that are present in the dictionary. Then he asked to optimize the solution. Then I used technique similar to Rabin-Karp algo + Hashing assuming collision is not a problem. Interviewer was satisfied after this solution. Code was not required.

Interview tips : Interviewers don't want most optimized solution. They see how you approach a question , Interact with interviewer if you get stuck ,don't jump directly to code, think loud and be confident.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 287 (On-Campus)**

Amazon visited our campus for SDE-1. Interview process started with an online coding round followed by 4 face to face interviews. All interview rounds started with brief introduction about me.

#### **Online Round :**

A hackerank contest with 22 questions consisting of 2 coding problems and 20 MCQ's on C, OS, DBMS, Networking.

Coding Questions :

- Given a 2d array with only two elements '#' & '.' . '#' represents cherry and '.' represents nothing. Can you divide the array into 2 halves with equal cherries. You can only make a single cut either horizontally or vertically.
- Sliding Window of size k . Find max in each window.

No need of optimization, brute force was accepted.

#### **F2F 1 (30 minutes , Director + Technical)**

- You have a 2-d matrix , you have to print matrix in Spiral Order Form. Production code was required.

- What is the most funniest and craziest data structure you have ever used.

I said Segment Trees. He asked me to explain it. Why to use it, explain it through some example, prove its complexity.

#### **F2F 2 (40 minutes, Technical )**

- You have a 2-d array (m\*n) , where every row and column is sorted in increasing order. You have to return an array which is sorted (basically have to sort given 2d

array)

Approach 1- insert all elements in map/set . ( O( $mn\log(mn)$ ) ) .

Approach 2- insert first element of each row in a heap (same as sort k sorted list of equal length), then call extract-min and insert next element from the required row.

Complexity- O( $mn\log(m)$ )

Follow up question- what if  $m >> n$  ?

Solution- Transpose the given matrix and follow the same procedure as above.

2. Given a binary tree containing positive and negative values, you have to find maximum sum that passes through parent. ( O(n) solution was required ).

Proper code was required for both the questions.

### F2F -3 (1 hour ,Technical )

Several questions on Operating Systems and Computer Networking.

Operating Systems- Difference between multi -tasking, multi-processing and multiprogramming, Virtual Memory, why to use Virtual memory, issues related to virtual memory , paging, segmentation , multithreading, difference between process and thread.

Computer Networking- What happens when you type www.amazon.com in Web Browser, how server handle requests, how routing works, difference between HTTP and HTTPS, how TCP works.

Coding Question- Given an array, find min element in the range  $(x_i, y_i)$  . Queries can be very large.

First i gave brute force approach (O(n) for each query ) and after that I gave a segment Tree solution to him. He told me to prove time and space complexity.

Follow up question- What if we delete some element from segment tree. How do you augment your data structure.

I said that instead of deleting we can update it to INT\_MAX value.

### F2F-4 (1 hour, Technical)

Given a string consisting of 3 types of brackets ( '(', '{', '[' ), there are priorities assigned to each bracket. You have to check if given string is balanced and valid.

Definition of valid- Higher priority bracket can't be inside lower priority bracket.

I solved it by a single Stack .

Follow up question-

Find the length of longest valid substring which is balanced and valid.

Then he asked if you have any questions.

Interview tips-

Interviewers don't want most optimized solution. They see how you approach a question , Interact with interviewer if you get stuck ,don't jump directly to code, think loud and be confident.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 286 (On-Campus)

**Round 1** (Online on HackerRank)

Duration: 90 minutes

20 MCQ questions mostly based on Operating System, Data Structures and Algorithms and a few puzzles.

2 coding questions

1. Given a string (which may or may not be a palindrome) of length ' $n$ '. Also given ' $k$ ' ( $0 \leq k \leq n$ ), such that ' $k$ ' represents the maximum number of characters of the string that you can replace to convert it to a palindrome. Your task is to convert the string to maximum palindrome that can be formed by replacing the string with digits 0-9. If it isn't possible to convert the string to palindrome, print "-1".

Note: Leading 0's in the string are also considered to be a part of palindromic string. Eg., 00100 is also a palindrome with leading zeros.

Test Cases:

- i.  $n = 4$ ,  $k = 2$ . Given input string "1111", then the output string would be "9119"
- ii.  $n = 4$   $k = 1$ . Given input string "1231", then the output string would be "1331"

2. Given a text and pattern string. The pattern consists of the following characters

- '+' : It can be replaced with 0 or more occurrence of the previous character
- '\*' : Matches any sequence of characters (including the empty sequence)
- '?' : It can be replaced with single occurrence of any character

Your task is to determine if the string and pattern match after successfully replacing the special characters in the pattern with the above rules. Print "true" if the text and

pattern match else print "false"

Test Cases: The first string is the pattern and the second string represents the text

i. Input : Am?zon Amazon

Output : true

ii. Input : Am?z\*on Amazon

Output : true

The MCQs were pretty easy to solve if the concepts are clear. The code was manually verified by team and then students were shortlisted based on the quality of code and overall score.

#### Round 2 (F2F) Duration: 60 minutes

The interviewer was in a hurry I felt and he asked me some basic questions like "tell me about yourself?" and then we discussed about my internship and it went on for 10 minutes before he came up with a question.

1. Design the shuffle button of a music player such that it maintains random property and make sure that it plays all the songs uniquely in a cycle (i.e, no song should repeat itself unless all other songs in a particular cycle are played)

I initially gave him an  $O(n\log n)$  approach. He wanted me to optimize it and after some pen and paper work I came up with an  $O(n)$  approach and the interviewer seemed to be satisfied.

#### Round 3 (F2F) Duration: 70-80 minutes

The interviewer was very friendly and made me comfortable by offering some snacks and water. Later he asked me to give my best shot and to not fool him if I had already heard of the problems he was going to ask. He asked me to tell few lines about myself and then discussed about my internship for 5 minutes and then fired few questions.

1. Traffic Car Problem. Given  $n$  people and  $n+1$  parking slots. Each person has a car and a parking slot allocated. One night they all go to a party and get drunk. They end up parking their cars randomly. What's the best way to go back to the initial configuration (one where every car is in the right allocated slot).  $n+1$ th parking slot can be used to swap the cars.

I told the interviewer that this question was asked to one of my friends and that I discussed it with him. He seemed impressed with my honesty. He then moved on to ask the next question.

2. A variation of stock buy sell to maximize profits problem : <http://www.geeksforgeeks.org/stock-buy-sell/>

3. Trapping Rain Water Problem : <http://www.geeksforgeeks.org/trapping-rain-water/>

Tips: Keep the interviewer involved in the discussion. Give him the approach and if you are not thinking in the right direction, they are always there to guide you. Don't jump to the code as soon as you are given the problem.

I coded the last two problems after explaining him the logic behind it and the interviewer seemed to be satisfied.

#### Round 4 (F2F) Duration: Around 90 minutes

Initially there was only one person who was interviewing me but then he was joined by another person and it looked that I needed both of their approval to move into the next round.

1. We started off with discussing my previous internships. He was very curious to know about what were my key deliverables as an Intern and also seemed to learn from my experience at those firms.

2. Count ways to reach nth stair : <http://www.geeksforgeeks.org/count-ways-reach-nth-stair/>

I first explained him how the result can be derived and then after he was satisfied with the logic, gave him a recursive approach, followed by the memorization approach and then the iterative Dynamic Programming approach.

3. Tree Isomorphism Problem : <http://www.geeksforgeeks.org/tree-isomorphism-problem/>

Logic was given and then I coded it. He still didn't seem to be satisfied and asked me to walk him through my code for an example tree and draw the recursion tree for the same.

4. Dynamic Programming (Longest Arithmetic Progression) : <http://www.geeksforgeeks.org/length-of-the-longest-arithmetic-progression-in-a-sorted-array/>

5. He asked me to design a student database efficiently.

Raw thinking was what he wanted I felt.

6. Few DBMS related query questions that were simple to answer.

#### Round 5 (F2F) Duration : 100-120 minutes

The interviewer was very friendly at the beginning. He became little strict as the interview went on and in the end he again turned back to the amicable mood he started with 😊

1. We started off with discussing my internships in detail. This went on for about 30 minutes until he was satisfied with that fact that I had put in lot of effort in making it a successful project.

2. Stock buy sell problem which was asked in the second round. I told him that this was asked to me in the earlier rounds and he seemed to be impressed with my honesty. I guess I got some loyalty marks there.

3. Connect the nodes of the binary tree in the same vertical level by using the next pointer. The tree could have nodes with at most two parent nodes.

Approach was given and he didn't seem to be fully satisfied with my code at first, but then after some optimizations he said it seems to be fine now.

4. Few question on Paging, Collision Resolving techniques, Page replacement algorithms.

Probably the interviewer wanted to make sure that the new hire is well familiar with other subjects other than DSA. He seemed to be satisfied with the answers.

5. Why Amazon?

The standard question that everyone is asked in the end of the last round.

Thanks GeeksforGeeks.

**Tips:** Try to be calm and give the interview. The interviewers are very well experienced and they not only test your technical skills but also read your expressions (on

how well you respond to what they ask). Sometimes luck might not be on your side, so do not get disappointed even if you are rejected. Keep practicing and indeed you will crack some good firm soon

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 285 (On-Campus for JD-SDE)

There were 5 rounds in total.

#### Round 1:

MCQs based on mainly OS and OOP.

Q.1 Tell whether a matrix containing 0s and 1s can be divided into 2 sub matrices containing equal number of 1s.

Q.2 Find maximum elements in an array in windows of size 3.

#### Technical Interview 1:

Q.1 Discussion on projects

Q.2 Some simple question involving unordered map. Then asked me to first implement the map and then use it.

Q.3 Several questions on OS (semaphores, mutex, scheduling)

#### Technical Interview 2:

Q.1 K-heavy problem. Given a binary tree, you need to prune it such that the final tree contains all root-to-leaf sums more than equal to k.

Q.2 Sort m arrays each of size n. He wanted the divide and conquer approach.

#### Technical Interview 3:

Q.1 Several questions on CN (Protocols, IP Addressing, High level design of a server system used in companies like Amazon)

Q.2 Sort a string in linear time.

Q.3 At Amazon.com, users log in and access random pages numbered as 1,2,3... Given at any time, you need to tell the most popular sequence of 3 pages visited by users.

Eg.

At some time t,

U1: P1, P2, P3, P8, P1, P2

U2: P8, P1, P2

O/P: P8, P1, P2

At time t+1, say

U1: P1, P2, P3, P8, P1, P2, P3

U2: P8, P3, P2

O/P: P1, P2, P3

#### Technical Interview 4:

Q.1 Given an array containing 0s and 1s your aim is to convert all 1s to 0s. You can only use an auxiliary function for doing this (No swapping or modification to order of elements can be done otherwise). The auxiliary function void flip(int index) toggles all the elements to right of index and index itself. You need to return the minimum no. of calls required to complete the task. Linear time is expected.

Also consider time complexity of flip function while doing complexity analysis.

Q.2 Tricky question which involved usage of hashing in Rabin Karp algorithm. Dont remember the exact question.

#### Note:

50/250 were shortlisted after MCQ round.

19/50 were shortlisted after 2 tech interviews.

16/19 were placed after next 2 interviews.

OS, CN and OOP is a must in addition to DS problems. All the best.

A big thanks to geeksforgeeks for providing such wonderful platform!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 283 (On-Campus)

Recently I got interviewed at Amazon on campus. The process was :

Online Round :

A hackerrank contest with 22 questions inclusive of 2 coding problems and 20 MCQ's on OS,Aptitude,DBMS .

Coding Questions :

1. Given a 2d array with only elements '# & '.' . '#' represents cherry and '.' represents nothing . Can you divide the array into 2 halves with equal cherries . You could only make a single cut either horizontal or vertical .

2. Sliding Window of size k . Find max of each window.

Round 1 :

Problem 1: Search in rotated and sorted array .

Interviewer wants all corner cases covered code .And also Max optimized time complexity .

I gave a O(2\*logn) solution he got satisfied .

Problem 2: Given a number k , Find no. of ways to make this number using sum of numbers from 1 to k-1 . Also You cannot take same number more than once in a combination and also all permutations of a combination count as one way .

For eg: if k= 6, Then all permutations of (1,2,3) count as one way only.

I got shortlisted after this round .

Round 2

It consists of a single problem only but a detailed discussion on that .

Problem : Range Minimum Query .i.e Given an array and a range query (xi,yi) find min element in the range (xi,yi) . These queries can be very large .

First i gave bruteforce approach and after that I gave a segment Tree solution to that with time and space complexity .

He then asked what if we have to update an element and then followed by updating a range .

After that he asked what if we delete an element . How do you modify your solution to cope-up with that .

I suggested him to update the element with INT\_MAX and maintain a mapping array .

After that he asked what if we add an element in the array ? .

I suggested him to reconstruct segment tree based on that . He suggested to construct it like a binary root instead of array representation and store the range . There can be some re-usable subtrees . How can i found those subtrees and how to use them and what will be the time complexities .

Lastly i was told to code range minimum query with node having following properties (min,start,end,node\* left,node\* end ) ;

He got impressed .:)

Round 3

It also consist of only a single problem .

Problem : Given set of coordinates find top k elements whose distance from origin in maximum .

I gave naive approaches and heap approach . Later he asked me to think more then i come up with Quick-Sort Partition function approach .

He asked me to code it .

Round 4

It was easiest of all so far .

It consist of problem : Given 2 linked list subtract them and store the result in bigger one and return that .

Basically he wants us to cover all corner cases for this .

After that a discussion on projects took place.

Thanks Geeks For geeks for huge programming problems database . Doing a great Job .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 282 (On-Campus)

I have just entered my third year and Amazon was the first company to visit our campus for Software Internship. The process was :

### ONLINE ROUND

2 Coding questions and 20 MCQs . The coding questions were:

1. <http://quiz.geeksforgeeks.org/lexicographically-minimum-string-rotation/>
2. It was an easy string question similar to [finding that the parenthesis are balanced or not](#) . Instead of the parenthesis , a and b were to be checked for , For eg )  
ababab is balanced ;its a good string  
abbbaa is a bad string .

I had practised MCQs from <http://quiz.geeksforgeeks.org/quiz-corner/> and many of the MCQs I had seen here before that were asked in the test. Sorting, hashing, complexity, recursion based MCQs were asked .

Also, 2 questions on OS , 1 on Networking and 1 on DBMS was present . I did not attempt these since there was negative marking . I solved around 14-15 MCQs and both the coding questions . (However, some students completing 1 were also selected .)

#### ROUND 1

1. <http://www.geeksforgeeks.org/serialize-deserialize-binary-tree/>
2. Spiral level order traversal of a binary tree from bottom level to top level.( I was allowed to use extra space(O(n)) .)

#### ROUND 2

This round was easier than the previous one for me and went smooth .

1. Set the rows and columns of a matrix equal to zero if an element in that row or column is zero (The elements could be positive or negative too ) . I told him the solution using O(n) space . He then asked me to do it without the auxillary space and I told him that it was not possible . (A solution without space could be given if all the elements were either non-negative or non-positive )
2. Merge k sorted linked lists . I discussed the approach using priority queue . Then he proposed another method of merging two lists into one and then merging it with the next . I explained him the complexities of both the approaches and then wrote the code for priority queue approach . He was impressed.

I would like to thank **GeeksforGeeks** for providing a huge set of problems for practicing for interviews. The internship archives were extremely helpful . Also I practiced on <http://www.practice.geeksforgeeks.org/> and interviewbit regularly in the summer break.

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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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

## Amazon Interview Experience | Set 280 (Off-Campus)

Hiring event in Delhi for Amazon Bangalore. First was written programming test and we needed to write full working code without a single bug. Guys please focus more on written, sometimes we don't take this serious and write code with many bugs.

#### Written Round:

Write most optimized solution for all problem.

1. Check a linked list is palindrome or not.
2. Search an element in a row and column wise sorted matrix.
3. Number of bits we need to flip from A to get B.

Problems are easy and can be solved if you have practiced for sometime from geeksforgeeks but the major part was writing clean and bug free code with most optimized solutions.

#### F2F – 1

After clearing the written round I went for first F2F round.

1. There is one class which has private array list and this array list is initialized in constructor of this class.

We have one public method getItem(int i) { " return ith item of array list" }, We need to know the size of array list. We can only call getItem method.  
<https://ideone.com/VaE0QL>

Please check the above code for more details.

2. Search an element in a BST.

3. Given a set of time intervals in any order, Print all the pair of overlapping intervals .

4. My college project was on RTOS (Real Time OS) and interviewer also did the same project when he was in college , so we had lot of discussion on project.

He was very impressed.

#### F2F-2

Here is F2F round 2 where I was not able to give optimized approach for the first problem.

1. Given a string and he asked me to find Longest Repeated Substring in the given string.

2. Given a mXn matrix with no obstacle and we can move in right or down direction. Count the no of paths to reach from top left cell to bottom right.

I gave recursive solution with  $2^n$  complexity and then optimized the solution using memoization.

3. Create sorted list of all unique partitions of given number 5 = { {4, 1}, {3, 2}, {3, 1, 1} .... }

<http://www.geeksforgeeks.org/generate-unique-partitions-of-an-integer/>

This round didn't go well and I was praying L Finally HR came and said you haven't performed well in this round so you will have another technical round and I was like "ok no problem".

#### F2F – 3

Finally last round of the day and I knew I have to perform well otherwise I have no chance.

1. You are given a dictionary and a string. You need to check the string is valid (exist in given dictionary) or not, if its not valid then perform one of the three operation (Insert , remove , replace) on string and get a valid string. We need to find another string which has One edit distance with this string.

Interviewer asked me about the data structure used to implement the Dictionary. I suggested Trie for dictionary. After some discussion he asked me to write code for insert in Trie and for the above problem.<http://www.geeksforgeeks.org/dynamic-programming-set-5-edit-distance/>

2. How to implement Trie. Space optimized version.

This was part of 1st problem and we had discussion on space of a trie when we have 500-600 characters in some language. I suggested HashMap instead of using static array in Trie. And then he asked me to write structure and Insert method.

3. Max sum tree . every node has its value plus maximum of left and right sub tree sum.

Expected time complexity O(N).

After this round HR told me to leave for the day and I will have one more technical and one Hiring manager round.

I was happy that I completed all the round.

4. Find maximum sum rectangle in given matrix.

#### F2F – 4 (Technical plus behavioural)

1. Find the maximum element in an array which is first increasing and then decreasing.

2. Project discussions.

3. Anything that you have done out of your responsibility.( In technical part )

4. Any situation when your manager really appreciated your work.

#### Telephonic Round with hiring manager.

This was my last round of the process and it was with hiring manager.

1. Tell me about yourself.

2. Your day to day work at current company.

3. Discuss any project which.

4. Any disagreement movement with your manager.

5. Why Amazon? and why are you leaving current company?

Guys prepare hard for behavioural questions, these questions are asked to know the person.

Then 2 easy programming questions but again the measuring part was code and the way we explain our solution.

1. Check a string is palindrome or not.

2. Count no of words in a string.

He asked me to write test case for both the problem.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 279 (On-Campus for Internship)

Recently Amazon visited our campus. There were total three rounds.

First round was an online coding round conducted on Hackerrank, It consisted of 20 Mcqs based on Data Structures, Sorting Techniques, Operating systems, Networking and some aptitude questions along with 2 coding questions,

The questions were:

1. Sort a linked list which consists of only 0s,1s and 2s.

2. Find the maximum product of three elements in an array which consists of both +ve and -ve numbers.

I Was able to solve both the coding questions in 15 minutes.

Out of 142 students that appeared, 33 were selected for the next round.

F2F-1

The Interviewers were very friendly and made me comfortable.

The questions asked were:

1. From an Inthreaded B.S.T delete all the nodes with a single child and explain its complexity.

2. A sorted array is rotated K times, find the index of the largest number.(A modified binary search can be used for this).

3. Largest Palindromic Substring from a string.

A total of 15 students out of 33 were selected for the final round.

F2F-2

1. Find median of infinite stream of integers.

2. Find all subsequences of a string.

3. Divide an integer array in 2 parts such that their sum is equal.

At the end 9 people were selected.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

# Amazon Interview Experience | Set 278 (On-Campus)

Recently Amazon visited our campus for recruitment process. They conducted several rounds based on the interviewee's capacity.

## Round 1:

90 minutes

20 MCQs and 2 Programming Questions.

Programs were based on Strings and Arrays.

The modules were already given by the company itself.

The first was conducted in HackerRank.

## Round 2:

75 minutes.

Pen and paper test.

It is also a programming round.

The number of questions will be get increased based on your solving ability within that 75 minutes.

They need O(1) solution for those questions, if it possible. Otherwise, they need the best solution for the given question.

They sat in front of me and assess my code.

Programming language is not a matter. You can use your preferable language. I prefer Python and C programming.

Note: They are very clear in this. Don't use any inbuilt functions. Sometimes, even striking out the code was not allowed.

## Round 3:

45 – 60 minutes

They ask me 2 programming questions and 3 testing and troubleshooting questions.

As usual, for coding they need only the best solutions.

For testing and troubleshooting, they need at least 30 – 40 test cases and troubleshooting techniques.

For me, He didn't ask me to stop until i write 35 for each.

I wrote 35 as minimum and 68 as maximum.

While you writing the solutions, they thoroughly go through your resumes and ask questions from that.

After the third completed, You can ask questions to the HR before you come out from the panel.

## Round 4:

Hiring Manager round

This round is different from other rounds.

For me, its 1 hour 45 minutes.

But some of my friends have different timings like 15 to 20 minutes and 45 to 60 minutes.

In this round, there are two HRs for me.

They gave their Self intro with awesome communication. Really awesome.

They ask,

Self Intro

Project Explanation

Testing for my Project

Testing for the project and scenario given by us – I wrote 94 test cases (when I get ready for 95th test case , she asked me to stop and said, "its enough..") .

Troubleshooting for the test cases provided by me to my Project – I wrote 60 test cases.

Troubleshooting for the test cases provided by me to the project and scenario given by us.

Then they ask Database queries and questions.

Programming question based on the File Management System – For this also, I prefer C Data Structures and Python – The expect more number of solutions as well as the best solution.

Communication was checked.

Culture fit questions.

Then, question session for me to them.

At last, they said, "Thank you Sathish , we done the interview. We will give the results to your Placement officer."

Thank you GeeksForGeeks :

Because, I prefer GeeksforGeeks for my programming preparations. You played a major role in my placement.

## Practice Amazon Interview Questions.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 277 (On-Campus for Internship)

Recently Amazon visited our campus for interns and placements. For interns it consisted of 1 online + 2 technical rounds.

## Online:(90 mins)

20 MCQ'S based mainly on sorting, OS,Networks

2 coding questions:

1. Given a number find the next greatest number formed with same digits

<http://www.geeksforgeeks.org/find-next-greater-number-set-digits/>

2. Find the largest increasing sequence in an array

<http://www.geeksforgeeks.org/dynamic-programming-set-3-longest-increasing-subsequence/>

#### Round 1:(40 mins)

The round started with discussion on projects, my strengths for first 20 mins

Then he asked me to write full working code covering all edge cases for

- 1) Finding nth node from end of linked list
- 2) Deleting nth node from end of linked list

#### Round 2:(45 mins)

1. Find the last non-repeating integer in a stream of integers in O(1) time complexity

2. <https://tkramesh.wordpress.com/2011/02/15/kite-cutting-more-on-dynamic-programming-4/>

Practice Amazon Interview Questions.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

## Amazon Interview Experience | Set 276 ( On-Campus SDE-I)

#### ■ Round 1(Online test : MCQ+Coding)

- 18 basic MCQ from OS, C, Shell, DBMS(SQL, NoSQL), puzzle(25 horses, find fastest three) :attempted 12/13
- 2 Coding questions:
  1. Given a string and a pattern state whether it follows the pattern. For eg: s = "redblueredgreen" matches pattern "abac" but not "aaab" as 'red' means 'a', 'blue' means 'b' and 'green' means 'c' here. String s only contains words "red", "green" & "blue" and pattern can have any character.[Done]
  2. Given a number n and k(no of swaps allowed), make the biggest number from n by making at most k swaps. If its already the biggest return the number itself.

#### ■ Round 2(F2F) 1. Given two arrays containing numbers find all possible orderings (a, b) such that $a \cdot b = P$ (given product) where a belongs to array 1 and b belongs to array b.

**Approach:** Store all elements from shorter array in hash and traverse the other and find if ( $P/b$ ) is present in the hash. If present print the ordering.

1. Given a circular road having gas stations at varying distances on the road. The cost to move from one station to another is given. You can refuel at each stations with all the present at the station as the tank capacity is infinite. Find if its possible to traverse the complete road and if yes then find the starting position to finish the route.

**Approach:** Start from beginning and start traversing the road. If fuel finishes at any point then move the start index backwards and add its gas to the tank. If its still -ve then keep doing it until you have enough to move forward.

#### ■ Round 3(F2F)

1. Given a  $N \times M$  matrix, print all squares/rectangles of all possible sizes(all 1\*1, then all 1\*2.... 2\*1... )

**Approach:** Brute Force

2. Serialize a Binary Tree

**Approach:**

1. Store any two traversals. But it takes a lot of space.
2. Store all the nodes and store for each node the information if it has left & right sub-tree or not in a Boolean array.

#### ■ Round 4(F2F) 1. Function to find optimal selection of packages from amazon warehouse. Packages contain varying units of a product for eg: one can have 5 units of iphones another can have 3 and so on. Each package is present infinitely ie. take one then there are still infinite left. You can break into a package, you have to take it as a whole. Also, smaller size packages should be used first. Lot of modifications.

**Approach:** Suggested subset sum dp solution. Couldn't handle infinite case properly. 2. Add one to a given number represented using a linked list where MSB was at tail and LSB at head.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 275 ( Off-Campus SDE-I Experienced)

I was interviewed in Delhi for SDE-I position in Kindle Frameworks Team at Amazon. I was working as a Project Lead in Samsung, Noida and had a total experience of 1 year 10 months in the Software Industry.

#### Round 1 : Written

- Print Boundary Traversal of a Given Binary Tree – <http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>
- Add Two Numbers Represented by Linked Lists – <http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>
- Print all Possible Permutations of a Given String by Placing Spaces (zero or one) – <http://www.geeksforgeeks.org/print-possible-strings-can-made-placing-spaces/>

There were about 80 candidates and the time allotted for this round is 1 hour. I was able to write all the 3 codes correctly in just 20 min and was the first candidate to move onto the second round.

#### Round 2 : Problem Solving (F2F)

- Median of Two Sorted Arrays – <http://www.geeksforgeeks.org/median-of-two-sorted-arrays/>
- Equal Size – <http://www.geeksforgeeks.org/median-of-two-sorted-arrays/>
- Different Sizes – <http://www.geeksforgeeks.org/median-of-two-sorted-arrays-of-different-sizes/>
- Maximum Size Square Sub-matrix with all 1s in a Given Boolean Matrix – <http://www.geeksforgeeks.org/maximum-size-sub-matrix-with-all-1s-in-a-binary-matrix/>

#### Round 3 : Design and Data Structures (F2F)

- Behavioral Questions :
  - Tell me about your Current Projects in Samsung.
  - What are your responsibilities as a Project Lead ?
  - Why do you want to join Amazon when you are doing so good in Samsung ?
  - At last a 15 min discussion about the most difficult problem I ever faced and how I tackled it with my coding skills and knowledge.
- Given a Sorted Dictionary of an Alien Language, Find Order of Characters – <http://www.geeksforgeeks.org/given-sorted-dictionary-find-precedence-characters/>
- What do mean by Dynamic Binding and Virtual Functions in C++ ? <http://www.geeksforgeeks.org/virtual-functions-and-runtime-polymorphism-in-c-set-1-introduction/>
- Discussion about Mutexes, Semaphores, ISR (Interrupt Service Routines), Deadlocks. <http://www.geeksforgeeks.org/mutex-vs-semaphore/>

The interviewer was highly impressed with my coding skills and shook hands with a sense of approval.

#### Round 4 : Hiring Manager (F2F)

The Hiring Manager introduced himself and told me that I've been doing really great till now. Then he grinned at me and said " Lets hope you don't mess it up in this round " .

(1) Which Sorting Algorithm is the fastest and why would you prefer it over others ?

While telling the answer, I said in between " If there would have been millions of numbers..... " and he caught that specific word of mine "millions" and hence the next 2 questions found the way on their own.

- In a city with millions of people, I want to sort them on the basis of their age. Which Sorting Algorithm would you use and why ?There's a Galaxy with Billions of Stars and distance of each star from the Sun is given . I want the closest 1 million stars from the Sun. Which Data Structure would you use and what would be the complexity ? (It is a variation of Finding K Smallest Elements in an Array)- <http://www.geeksforgeeks.org/k-largestor-smallest-elements-in-an-array/>
- Find distance between two given keys of a Binary Tree <http://www.geeksforgeeks.org/find-distance-two-given-nodes/>

He scrutinized the entire code for any possible errors and found it perfect.

- Discussion about Inner and Outer Joins in SQL. <http://quiz.geeksforgeeks.org/inner-join-vs-outer-join/>

Then he stood up and shook my hands with a broad smile and said " Well Done Man ! " and left.

#### Round 5 : Bar Raiser (F2F)

- Design an **Algorithm to Transform One Word to Another through Valid Words** of a Given Dictionary. (It is clearly a variation of the **Edit Distance Problem**, but in Edit Distance we do not care about if the intermediate word is valid or not) .-<http://www.geeksforgeeks.org/dynamic-programming-set-5-edit-distance/>

Only this question was asked in this round and the discussion went on for about 45 minutes.

All credit goes to <http://www.geeksforgeeks.org/> team for providing such an inspirational and a brilliant platform for coders. Keep it up guys, Way to go !

#### Suggestion for other candidates interviewing at Amazon :

- Try to write Neat and Clean codes without any cutting or hassle, taking care of all the boundary cases.
- Be very precise and explicit in your answers. **Keep Coding** and All the Best !

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## GATE CS Corner Company Wise Coding Practice

# Amazon Interview Experience | Set 274 ( On-Campus)

## Round 1: (Online in Hackerrank)

20 MCQ questions based on outputs, DS, OS, DBMS.

1. Print all possible words from phone digits – <http://www.geeksforgeeks.org/find-possible-words-phone-digits/>
2. Given a matrix where elements are inserted as 1 to n in row 0, n+1 to 2n in row 1 and so on till  $n^2$  and you traverse the matrix in spiral manner, find the kth number you will visit.  
eg. n = 3  
matrix: 1 2 3  
4 5 6  
7 8 9  
 $9k = 4$ , output: 6  
 $k = 6$ , output: 8

## Round 2: (F2F)

1. Sort an array of 0's,1's and 2's. – <http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/>

2. Given a linked list like 10->8->3->4->5->6

modify it to

4->2->1->4->5->6

The last number is subtracted from first number, 2nd last from 2nd number and so on till middle of link list.

First gave him a brute force approach  $O(N^2)$  , then  $O(N)$  approach in which reverse of 2nd half of list is done. He told to do this without reversing the list.

Then used a stack and gave him final solution.

## Round 3 : (F2F)

1. Given a number n and a pattern that follows like:

(1 to 26): a,b,c,...z

(27 to 52): aa,ab,ac,...az

(52 to 78): ba,bb,bc,...bz

.

za,zb,zc,...zz

aaa,aab,aac,...aaz

aba,abb,abc,...

.

find the nth pattern

2. Convert a Binary Tree to Doubly Link List in place- <http://www.geeksforgeeks.org/convert-given-binary-tree-doubly-linked-list-set-3/>

3. Clone a graph and analyze the time and space complexity. First did it using two traversals of BFS and using map. Then did it using one traversal of BFS and map.

## Round 3:(F2F)

1. Count the number of inversions in an array- <http://www.geeksforgeeks.org/counting-inversions/>

2. Tell a data structure which you will use to implement best fit algorithm. I told him BST. Then he asked me to implement it.

<http://www.geeksforgeeks.org/floor-and-ceil-from-a-bst/>

3. Longest Common Subsequence (Both recursive and dp approach)

4. Box stacking Problem – <http://www.geeksforgeeks.org/dynamic-programming-set-21-box-stacking-problem/>

5. One DBMS query select 2nd max salary from table,

6. OS questions from deadlock, synchronization, scheduling, diff between process and thread.

## Round 4:(Telephonic round)

1. About my summer internship

2. OS, DBMS , OOPS questions \

3. <http://www.geeksforgeeks.org/find-the-row-with-maximum-number-1s/>

4. What happens when you type URL in browser and hit enter? Explain in detail.

5. Given a number in form of array and number K you have to form largest number after swapping elements K times.

You can swap only adjacent elements

e.g Array -> 4 5 7 8 2 3

K=2

Output -> 7 4 5 8 2 3

Only algo was needed.

## Thanks GeeksforGeeks. Placed@Amazon

Recruiter at amazon are very friendly. For each question working code was expected and time and space complexity was asked.

Interact with the interviewer if you get stuck. Try to come up to different approach to solve the same problem. Their main focus remains on how you see a problem and try to solve the problem. Dont jump to code it as soon as you are given the problem, first discuss it then go for coding if asked.

**Be confident and do not give up if you cant get the perfect solution!!**

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on the GeeksforGeeks main page and help other Geeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 273 (On-Campus)

I would like to share my Amazon Interview Experience (for Internship) with your audience.

#### 1st Round (Online Coding Round):

It was 90 min test on Hackerrank. It had 20 MCQs and 2 coding questions. The MCQs were from topics like time complexity, different sorting algorithms, dbms, os, 3-4 puzzles and apti, output of the code, etc.

The MCQs had negative marking of 0.50.

Students of CSE, IT, ECE were allowed and there were around 160 candidates.

#### Coding Questions:

1. Find the first non-repeating character of the string.
2. There is a square matrix of order n which is filled from 1 to  $n^2$  in row major. Find the Kth element in spiral traversal of the matrix.

Example: Given n=3 and K=5.

Matrix:

1 2 3  
4 5 6  
7 8 9

Output: 9

I solved both the coding questions and attempted 16 MCQs and qualified for the next round. It is very important to solve at least one coding question to qualify for the next round.

#### Second Round (Personal Interview-I):

Time: 40-50 minutes. 31 candidates were selected for this round.

It started with tell me about yourself. Then the interviewer asked me my JEE(mains) rank and also what data structures I know. She asked me basic tree questions such as what is tree, what is bst, how many types of traversals are there and to name them. Next, she gave me this problem:

1. You are given an array of elements, find out if the array represents Pre-order traversal of a BST.

I thought on it for few seconds and gave her  $n^2$  logic. Before she asked me to optimize it, I told her that I can try to optimize it.

Then after thinking about it for few minutes, I told her my O(n) logic.

After listening to my approach, she asked me to code it. I wrote the code without any error at one go. She asked me the time complexity and space complexity of my code after checking if its error free or not.

After this, the interviewer asked me theoretical questions on OS such as what is critical section, mutex, semaphore, virtual memory, page fault, ways of preventing deadlock, etc. Then she made a simple table and asked me to write SQL query for it which was very easy. She asked me what is indexing in DBMS, difference between its types and if the query I wrote is case sensitive or not.

Next the interviewer asked me if I know clone a linked list problem or not.

I said, yes. So the interviewer changed the question.

2. Given an array with both negative and positive numbers, find the maximum sum contiguous sub-array.

I told the interviewer my approach (modification of Kadane's algorithm). And she asked me to write the code. I wrote the code without any errors.

#### Third Round (Personal Interview-II):

Time: 80-90 minutes. 8 candidates were shortlisted for this round.

First the interviewer went through my resume and asked me about my recent project. Then he asked me if I am comfortable with trees. I said yes. He asked me:

1. <http://www.geeksforgeeks.org/vertical-sum-in-a-given-binary-tree/>

I told him the approach and he asked me to write the code. I wrote the code without any error.

Then he asked me theoretical questions. Started with virtual memory concepts, next he wrote a code and asked me if there was any error. Then he asked C/C++ questions based on malloc/calloc, new operator, etc. A tricky question on exception handling. There were many other theoretical questions which I don't remember.

2. Then he gave me this problem:

There are n number of people required to do some tasks. Among these n persons, some x number of person require a key to start their work. There are infinite keys which are thrown one by one in front of people in every unit time. The time required by a person to pick up the key is one unit time. Furthermore, the interviewer mentioned conditions such as some particular person can only start after some other particular person finishes his task. The time required by a person to finish his task is one unit. He asked me to find the minimum time in which all people finish their task.

After thinking for few minutes, I told the interviewer my approach using topological sorting in graph. Then he asked me to explain topological sorting in detail. Then he moved on to another question.

3. You are in a forest and there are many paths. You need to get out of the forest. Which path do you choose?

It was a problem of finding the minimum distance between source node and destination node in a graph.

I told him my approach and then he asked me to explain dijkstra's algorithm. Then the interviewer asked me the difference between dijkstra's algorithm and floyd-warshall algorithm. Then he asked me about prim's algorithm and kruskal's algorithm.

Then he gave me another interesting problem.

- For each node of a binary tree, you are given the node id and sum of the ids of its children. Find the node id of the root.

After few minutes I came up with a wrong approach. As soon as I told the interviewer about it, I understood I was wrong. Then he told me to focus on the sum of the ids. Then within a minute I told him another approach. He asked me why this works, I explained him and he was satisfied.

After that the interviewer asked me if I had any questions for him. At last, he again asked me about one of my project in which I used Alexa.

Keeping calm will help you come up with a correct solution faster, ask questions to interviewers if you have any doubt, they are very friendly. [Practice](#) questions from geeksforgeeks. It helped me a lot. Thank you geeks.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

### Amazon Interview Experience | Set 272 (On-Campus)

#### Round 1: (online in hackerrank)

20 MCQ questions based on outputs, OS, DBMS.

- Print all possible words from phone digits

- Given a matrix where elements are inserted as 1 to n in row 0, n+1 to 2n in row 1 and so on till n^2 and you traverse the matrix in spiral manner, find the kth number you will visit

```
eg. n = 3
matrix: 1 2 3
        4 5 6
        7 8 9
k = 4, output: 6
k = 6, output: 8
```

#### Round 2: (F2F)

- Given a boolean matrix find the row with maximum number of 1s

2. Given a pointer to a node of a tree, print the inorder successor. Assume that you have a function getParent(node) which returns the parent of the node

- Given a array find the configuration where we will get max sum of i\*array[i]

eg: 8312 = 8\*0 + 3\*1 + 1\*2 + 2\*3 = 11

3128 = 3\*0 + 1\*1 + 2\*2 + 8\*3 = 29

1283 = 1\*0 + 2\*1 + 8\*2 + 3\*3 = 27

2831 = 2\*0 + 8\*1 + 3\*2 + 1\*1 = 15

max value here is 29 when array is rotated by 1

expected time complexity O(n)

hint: see what goes out and what comes in when the array is rotated. You dont need to rotate the array

Some questions that my friends were asked:

- Root to leaf path sum equal to a given number. Also print the path

- Given a number n and a pattern that follows like:

(1 to 26): a,b,c,...z

(27 to 52): aa,ab,ac,...az

(52 to 78): ba,bb,bc,...bz

.

za,zb,zc,...zz

aaa,aab,aac,...aaz

aba,abb,abc,...

find the nth pattern

- Given a linked list like 1->2->3->4->5->6->7->8

modify it to 1->8->2->7->3->6->4->5

#### Round 3:(F2F)

1. part 1: Design the snake and ladder game. consider cases like there may be another ladder at the end of another ladder, or a snake at the end of another snake. Mainly focus on the data structure you will use to design the game and all cases.

part 2: now that your game is designed, find the minimum number of dice throws/jumps you will have to make to reach the end i.e. 100 starting from 0 you can control the value that comes up when you throw a dice.

2. Explain heap sort, hipify, percolate\_down, time complexity

#### Round 4:(F2F)

1. OS related questions like what is paging, page faults

DBMS: transactions, ACID property, primary indexing, secondary indexing, multilevel indexing

2. Given an array check if the array can be a preorder traversal of a BST

3. Design a data struct such that insert, delete, findMin(), find() can be done in O(1)

4. Diagonal view of a tree

similar to <http://www.geeksforgeeks.org/diagonal-sum-binary-tree/>

5. Diameter of a Binary Tree

#### Round 5:(Telephonic round):

1. About my summer internship

2. OS, DBMS questions

3. Given an array, just make the B-tree of order 3

4. Design STL map

5. Given a tree, connect all siblings. Asked me to give both iterative as well as recursive approach

Thanks Geeksforgeeks.

Recruiter at amazon are very friendly. Interact with the interviewer if you get stuck. Try to come up to different approach to solve the same problem. Their main focus remains on how you see a problem and try to solve the problem. Don't jump to code it as soon as you are given the problem, first discuss it then go for coding if asked. Be confident and don't give up if you can't get the perfect solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 269 (1 year experienced for SDE-1)

Online Round: 2 Programming questions for 2 Hours

- Convert set of strings in number as given on phone keypad. String will contain only lower case characters. Print these strings with numbers in descending order of numbers, if numbers are same then lexicographical order of strings.

**Input:** amazon, rat,pat

**Output:** 262966 amazon

728 pat

728 rat

- In a M\*N maze you can move in any direction(left,right,up,down). There are bomb on some positions. Starting from (0,0) find the number of moves require to exit from the maze. Exit point is (m-1,n-1). If its not possible then return -1. Similar to Minesweeper Game.

#### 1st Round(F2F) 1hr:

Ask everything about project working at current company.

- <https://www.careercup.com/question?id=7449675> in-place. Had to write proper code for it.

#### 2nd Round(F2F) 1hr:

Asked everything about project and lots of cross questions on the same. Interviewer gave me lots of scenarios related to my project and ask to solve them.

- <http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/> in place. He asked me if i knew the question, I said yes. Then he told me to write code covering all corner cases.

#### 3rd Round(F2F) 1hr:

- <http://www.geeksforgeeks.org/find-a-pair-with-given-sum-in-bst/> . Asked all possible solutions and then asked to write code for it.
- <http://www.geeksforgeeks.org/merging-intervals/>. Code for it.
- <http://stackoverflow.com/questions/14094914/count-the-number-of-occurrences-of-a-number-in-a-sorted-array>. O(nlogn). Asked to explain the solution then to write the code.

#### 4th Round(F2F) 2hr:

- Correct a deformed BST. All kind of approaches and proper reasoning for each. Then asked to write the code.
- Array question. similar to <http://www.geeksforgeeks.org/given-a-string-find-its-first-non-repeating-character/> .
- <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>.

All the interviewers were very helpful. In all rounds for every question they were looking for what kind of approach you are going to use and proper reasoning for the same. Not just coding , neat and efficient coding was required because for each question at the end you have to code and they expect you not to miss edge cases.

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

## GATE CS Corner Company Wise Coding Practice

Experienced  
Amazon

### Amazon Interview Experience | Set 268 (Experienced)

I had worked at TCS,Chennai for 6 months and then was working at SAPLabs,Bangalore for last one year. I was interviewed at Amazon,World Trade Center for the position of Software Development Engineer.

#### **Round 1:Written Round**

- a. Find a pair that sums to zero in a sorted array.

<http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/>

- b. Buy and sell shares to maximize profit

<http://www.geeksforgeeks.org/stock-buy-sell/>

- c. Replace all nodes in BST with its greater sum

<http://www.geeksforgeeks.org/add-greater-values-every-node-given-bst/>

#### **Round 2:Face to Face**

- a. Find all anagrams of a given string.

The question is simple but there was a twist,the file size was 1TB.Interviewer asked me to optimize the solution.I gave a HashMap solution where key was the length of strings in the file and value was number of such strings.

Finally,I was able to solve the question with Trie data structure.

- b. Given a Hotel and checkin/Checkout time of visitors, find the maximum numbers of rooms required. (different version of Trains/Platform question)

#### **Round 3:Face to Face**

- a. Find a row with maximum number of 1s in a

binary sorted matrix.I knew this questions before so I got another question

- b. Rain Water Trapping problem

<http://www.geeksforgeeks.org/trapping-rain-water/>

- c. Given two strings print all possible permutations of two strings such that the order of characters are maintained.

I gave a topological sort solution and then a recursive solution.

#### **Round 4:Hiring Manager Round**

- a.A lot of behavioural questions like weakness,strengths,why leaving previous organization.

- b.Detailed description of projects

- c.Given an array,generate all valid ip address from the array.

A lot of discussion on this question and finally I gave a hashmap solution to this question.Time complexity: $O(n)$

#### **Round 5: Bar Raiser**

- a. A lot of behavioural questions,why amazon etc etc

- b. Find the longest palindromic substring in a string.

I told him we can reverse the string and find the LCS for both strings.

Full working code was required at each round and time complexity was discussed in detail for questions. Thanks a lot geeksforgeeks.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Amazon

### Amazon Interview Experience | Set 267 (8 Months Experienced)

Recently, I got a chance to be interviewed by Amazon at Bangalore campus, through referral.

I had 8 months of experience in a product based company and 5 months of Internship.

#### **1st Round Telephonic :**

There were two guys, started with a formal introduction.

Question 1 : Given an array and a number say "Num1". Find two numbers whose sum is equal to given number "Num1".

<http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/>

I told him first Brute Force solution then he asked the time complexity which I told him  $O(n^2)$ .

Then he asked me to optimize the solution and I gave a  $O(n\log n)$  solution using sorting.

And at last I told him  $O(n)$  solution using Hashing.

Question 2 : Given an array of stock prices . Determine the maximum profit one can get by buying and selling the stock(Similar to stock span problem).

<http://www.geeksforgeeks.org/the-stock-span-problem/>

I told him brute force solution of  $O(n^2)$  then he asked me if you could give an optimized solution.

I told him  $O(n)$  solution using stack but code got stuck on some of the test cases and he asked me to modify the code but I couldn't as they were running out of time.

They provided me a link to Colabedit(kind of google shared document) where I had to code.Production ready code was required.

After 2 days I got call from Amazon saying that feedback was positive and they asked me to come for face to face interview at Amazon's office.

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

Started with a brief introduction.

Q1 : Given a M\*N matrix . you have to start from Index(0,0) and reach to Index(M-1,N-1) with maximum sum , given the constraint that you can only move right or down i.e if you are at index (i,j), you can only move to index(i,j+1) or to index(i+1,j)

I gave recursive solution for this and there were a lot of discussion on various test cases.

He asked me to optimize the code. I gave him Dynamic programming approach . He asked that have you done it before and i said no then he asked me to code it. I had no idea of the code as i haven't done it before. I struggled to write the correct code 2-3 times and at last i wrote the correct code.

Then he said to me i am done with the interview, Do you have any question for me and i asked two question.

Production ready code was required.

#### F2F Round2 :

Again Started with a brief introduction and some project discussion.

Q1 : A question similar to LCA(Least Common Ancestor) of Tree and i gave the answer immediately as i have understood the question and didn't ask any further clarification.

Q2 : Given some resources in the form of linked list you have to cancel out all the resources whose sum up to 0(Zero) and return the remaining list.

I gave the solution immediately but couldn't handle some of the corner test cases then he asked me to modify the code accordingly.

Then he asked me to write all the test cases for it and i did.

For eg; given the resources like this :

case 1 : 6 -6 8 4 -12 9 8 -8 It should return 9 as all others get canceled.

In the above example lists which gets canceled :

6 -6

8 4 -12

8 -8

o/p : 9

case 2 : 4 6 8 -9 10 -9

o/p : 4 6

case 3 : 4 6 -10 8 9 10 -19 10 -18 20 25

O/P : 20 25

#### F2F Round3 :

Started with a formal introduction and BTW he was the same guy who took my telephonic interview.

Q1) He asked me subset sum problem i.e; Given an array find the maximum sum contiguous subarray.

I gave O(n) solution for finding the maximum sum immediately after he asked the question as i knew the solution.

Then he asked me to trace the code for some test cases and it passed. Then he asked me to find the starting and end index of the subarray and I modified the code and initially got wrong but after some modification I got the code right.

Q2) Sum of numbers represented by two linked list .

And i gave the answer immediately after he finished the question. But i gave the soln for adding two linked list numbers starting from beginning but he told me add the numbers as we do in normal addition.

And i gave that solution to by reversing the linked list and then adding the numbers and finally reversed the resultant list.

After 2-3 days i got a call from Amazon that i have cleared the rounds and they asked me to come for Hiring Manager Round.

One of the interviewer gave me feedback that he mugged the answer as i gave the answer immediately after the interviewer asked the question as i came to know later which was major set back for me.

So one of the advice would be to all of you that Eventhough you know the answer pretend that you don't know. Ask some clarification question, As they also observe your problem solving skills with coding.

#### Hiring Manager Round F2F :

Started with some basic questions and then asked why do you want to leave your current company and then he asked code Of Fibonacci series.

I explained Fibonacci series and then he asked me to code it .

I wrote the code and traced on some inputs.

Then he had a meeting as i reached late there so he asked me to improve the code as he said there is some bug in the code and i did .

After that he asked me to write recursive code for it .

Then he asked the time complexity of the code and i said Exponential.

Then he asked me to prove it.

I said sir i could do it using Master Theorem or using Mathematical Induction. But right now i remember none of them .

Then he told me that you can do it without Master Theorem or MI . Then in my mind it struck as Recursion Tree Method but at that time i didn't had no idea of recursion tree methodas well. So i couldn't tellhim.

My this round wasn't positive as i knew right after my interview. i got eliminated after this round.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Amazon

## Amazon Interview Experience | Set 266 (Off-Campus for SDE1)

### Written Test (on Hackerrank)

20 MCQ's and 2 Coding Questions to be solved in 90 minutes

1) NEXT PERMUTATION: Next Largest Number with same set of digits.

For Ex: I/P: 123, O/P: 132

2) DFS + DP Standard Question. I don't remember the exact problem statement, but it was pretty standard one and required a DFS+DP solution.

### Round One (Telephonic)

1) Given an array of zeroes and ones. You are allowed to flip any one 0 so as to maximize the continuous number of one's.

A variation of this problem: <http://www.geeksforgeeks.org/find-zeroes-to-be-flipped-so-that-number-of-consecutive-1s-is-maximized/>

2) Given only a Node of a Binary Tree, Find the next in-order successor in O(1) space. Root of tree is unknown.

As he told to assume anything except the position of root, To solve the problem I assumed that the Treenodes also contain parent pointers to their respective parent.

#### Round Two (F2F)

1) Given a Binary Tree. Print its elements vertically. Solved it using Horizontal Distance concept and hashmap.

<http://www.geeksforgeeks.org/print-binary-tree-vertical-order-set-2/>

2) Variation of above question, you are not allowed to use Hashmap. Discussed many approaches. He applied a constraint of not using any Hashing, after a lot of discussion and variations came up with the solution as a Doubly Linked List of List of Nodes. Since I was not allowed to use hashing, the variation I did to solve was to maintain a global pointer to the doubly linked list, moved it left in doubly linked list for the left child of current treenode and move right for right child of current tree-node.

#### Round Three (F2F)

Introduction and Internship related discussion followed by these technical problems

1) Given a Stream of sorted integers. Size of input vector is unknown. Find a given integer. Expected Complexity: Log(n)

Hint: Used Perfect Square's as the start index and end index in binary search approach.

2) Variation in above problem, as we do not know the end point. Lets assume we have a function which returns NULL if the threshold index (Size of input vector) had crossed. Now improve above solution to handle the case.

Ex: Lets assume that the array size is

3) Subject Related Questions: TCP v/s UDP, Virtual memory, Cryptography etc

4) Design a Music Player which plays songs in random order without repeat. Came with O(n) Time and O(1) space solution.

#### Round Four (F2F)

Introduction, Project related questions followed by:

1) Given k sorted Linked Lists. combine those into one sorted list.

Used custom Min heap approach to do the same.

2) Implement Custom Min Heap for above problem.

3) Print Nodes at distance "k" from a given node in a binary tree.

#### Round Five (Telephonic)

1) Introduction and Project discussion.

2) Convert given integer into Roman Number format but by using minimum number of conditional statements. Came up with lot of approaches, he was not satisfied with any approach and asked to remove as much conditional statements as I can.

3) Given an array of zeroes and ones. find the maximum size of subarray with equal number of zeroes and ones. Came up with O(n) time and O(n) space solution, something similar to the one discussed here:<http://www.geeksforgeeks.org/largest-subarray-with-equal-number-of-0s-and-1s/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 265 (On-Campus Internship)

Amazon recently visited our campus for hiring interns for 6 month internship.

#### Round 1: Online Test

The round-1 was an online test of 90 minutes. It was hosted on HackerRank platform. There were 20 MCQ questions and 2 coding questions. MCQ questions were of 1 mark each. There was a negative marking of 0.25 for each wrong MCQ answer. The MCQ questions were from data structures, DBMS, aptitude, etc.

The coding questions were:

Q1. <http://www.geeksforgeeks.org/reverse-words-in-a-given-string/>

Q2. <http://www.geeksforgeeks.org/find-possible-words-phone-digits/>

Note: It is very important to do atleast one coding question to clear this round. Even if you get all your 20 MCQs correct but you don't do any coding question then your chances of getting selected are very low. I suggest everyone to do all the MCQs they can in initial 30 minutes and then devote last 60 minutes for coding questions.

I did 15 MCQs and 2 coding questions. I got selected for next round. Overall, 19 students got selected for next round.

#### Round 2: Interview

The interviewer first asked me about one of my project that i mentioned in my CV. Then he asked me two questions.

Q1. We are given a mapping: A is mapped to 1, B is mapped to 2, C is mapped to 3 ... Z is mapped to 26. We are given a number n, we have to tell how many distinct strings can be formed from this number n using the given mapping. For example,

Input: 121

Output: 3

Explanation: We can read the number n as 1, 2, and 1. The string formed will be ABA (1=A, 2=B). We can also read the number n as 12 and 1. The string formed will be LA (12=L, 1=A). We can also read the number n as 1 and 21. The string formed will be AU (1=A, 21=U). So we can form maximum 3 distinct strings out of number 121 using the given mapping.

I gave a recursive solution and the interviewer was satisfied with my solution. So he asked me to code my solution on a paper. I coded the solution and then he

checked my code. Once he was satisfied, we moved on to the next problem.

Q2. <http://www.geeksforgeeks.org/remove-bst-keys-outside-the-given-range/>

After a while the shortlist was announced. 10 students got shortlisted for the next round. I too got shortlisted for the next round.

#### Round 3: Final Interview

This was the final interview of the process. The interviewer first asked me to introduce myself and then he asked me about one of my project. He then asked me several questions, which are as follows:

Q1. What is a binary tree? What are different types of traversals in a BT? What is the difference between these traversals? Which of the traversal is based on BFS and which is based on DFS?

I answered the questions appropriately. He was satisfied with my answers.

Q2. <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

Once i gave him the solution, he asked me to code it on a paper. He checked my solution manually with some test cases. Once he was satisfied, we moved on to the next question.

Q3. What is a max heap? What is a min heap? What are some real life applications of heaps?

Q4. How to insert in a heap? What is the time complexity?

Q5. How to delete a min element from a min heap? What is the time complexity?

Q6. Given an array of n numbers, how can i build a min heap from the array. What is the time complexity?

I answered him appropriately. I told him that we can solve the above problem in O(n) time complexity. He then asked me to prove that the complexity is O(n). I proved it with an example array. He was satisfied with my answer.

Q7. There is a constant flow of numbers coming in from some infinite list of numbers out of which you need to maintain a data structure as to return the top 100 numbers at any given point of time. Assume all the numbers are integer numbers only.

Sol: I gave him a solution using min-heap. We can create a min heap of 100 elements. The first 100 elements is easy to handle. Let say we get the 101th element in the list. If this number is less than the root of the binary heap then we need not do anything. If this number is greater then the root of the binary heap then we need to replace the root element with this element and call percolate-down procedure on the root of the binary heap.

My interviewer concluded my interview with this question.

I suggest everyone to go through Amazon interview experiences of atleast 5 people from geeksforgeeks.com before their Amazon selection process. Finally, i would say focus on data structures, OS, DBMS and networks. In data structures, focus mainly on binary trees, binary heaps and linked lists.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Amazon

## Amazon Interview Experience | Set 264 (Experienced for SDE1)

I had around 1 year and 9 months of experience. And applied for SDE1

#### First Round (F2F):

1. What are data structures in which you are most uncomfortable.
2. What is your favorite sorting algorithm. Give a dry run.
3. Heap sort, dry run, Complexity of building heap, prove it.
4. <http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1> , extended for n-array tree.
5. <http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/> ( in single scan)

#### Second Round (F2F):

1. Tell me about yourself.
2. What is the most challenging project you have done, your contribution.
3. <http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>
4. <http://www.geeksforgeeks.org/find-the-longest-substring-with-k-unique-characters-in-a-given-string/>

#### Third Round (F2F):

1. Tell me about yourself.
2. Most challenging project, why it was challenging, your role in it.
3. Implement a LRU cache, extended for LRU with ttl at each block.
4. <http://www.geeksforgeeks.org/k-largestor-smallest-elements-in-an-array/>
5. Full working code of Dijkstra Algorithm and a dry run.

#### Fourth Round: Hiring Manager (Telephonic)

- 1 Tell me about yourself, company role and responsibility and many behavioral questions.

- Your current Group/Team structure.
- Promotion criteria in your group.
- Situation when you helped your colleague
- Situation when you needed help from a colleague.
- If one of team member is not working or working very slow, how will you handle the situation.

- When you have trained any colleague.
- Technology suggested by you in your team.

2. Detailed discussion about previous projects.
3. If you have indefinite budget and indefinite time, what type of project would do ?
4. Design a notification system.

#### Fifth Round: Bar Raiser

1. Tell me about yourself.
2. Find smallest positive missing number from an array of positive numbers.
3. Disagreement with your immediate supervisor, how your relation got affected after that disagreement.
4. Your one area which needs to be improved.
5. Your strongest strength.
6. A work in your project which made you proud.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Amazon

## Amazon Interview Experience | Set 263 (For SDET)

It's an on campus recruitment. The interview process started on October, 2015.

### Round 1:

It had 25 MCQ questions from core subjects of CS including Operating systems, Database, Networks, Data structures and algorithms, Fundamentals of programming. Apart from that there were 2 programming questions too. Those who solved at least 1 programming problem and few MCQ questions were selected for next round. But it's better to solve both the programming questions. I was asked the following questions:

1. <http://www.geeksforgeeks.org/merge-two-sorted-arrays-o1-extra-space/>
2. <http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>

### Round 2:

It was a phone interview of duration 1 hour. It was conducted on collabedit.com. This round consisted of 2 data structures and algorithms related questions. I was asked the following questions:

1. <http://www.geeksforgeeks.org/write-a-c-program-to-print-all-permutations-of-a-given-string/>
2. <http://www.geeksforgeeks.org/write-a-function-to-reverse-the-nodes-of-a-linked-list/>

### Round 3:

It was similar to that of round 2. I was asked the following questions:

1. <http://www.geeksforgeeks.org/square-root-of-an-integer/>
2. <http://www.geeksforgeeks.org/print-nodes-distance-k-given-node-binary-tree/>

Overall it was an awesome experience. I enjoyed the interview process.

Thanks for geeksforgeeks!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 262 (For SDE1)

I am 1.5 year experienced guy, currently working in one good Product Based company in Whitefield,Bangalore. I have spent 1.2 years in my present company and previously, I spent 6 months in TCS Pune.

Recently, I got a chance to be interviewed by Amazon at Bangalore, through a referral (made friend from Facebook :p). I was preparing for Amazon from last 6-8 months from GeeksforGeeks.org. I must say, GeeksforGeeks is making life of people. I got an offer from Amazon by preparing from GeeksForGeeks.

Questions :

As I reached to 25th Floor of WTC, Brigade Gateway, we 25 people were asked to write code for these 3 questions on paper (OnSite Written Round) :

1. Two numbers are represented by 2 linkedlists. Find the resultant linkedlist represented as sum of these given linkedlists.

2. Given a number say 12345, find the immediate next number using the same digits, in this case 12354.

3. 3 points of a triangle are given. Find if given forth point lies inside or outside of the triangle.

#### F2F Round 1 :

1. Given a Hotel and checkin/Checkout time of visitors, find the maximum numbers of rooms required. (different version of Trains/Platform question)

2. Given sequentially placed boxes, each representing a number( which may be positive or negative), we need to select the numbers in order to have the maximum sum, having the constraint that if we select a given box, we cannot select adjacent box to it, but can select any other.

Solution : let the boxes positions be the indexes of array and their values as array values. then if we select value at index 0, we cannot select value at index 1, but can select from index 2,3,, and so on.so we can apply Dynamic programming here.

#### F2F round 2 (Hiring Manager Round):

HR called me and gave me some tips before this Interview(I must say Amazon Interview people are really cool and make the candidate feel comfortable). He told me listen the question carefully and answer perfectly as this interview matter a lot.

1. Asked about my experience and work in current company. (Discussion lasted for about 1 hour) as I explained in deep and he asked cross questions.

2. Given 2 numbers, add them without using any arithmetic operator.

Hint : Use Binary Operators (specifically '<<', '&', '^')

Gave answers to this question and he was really impressed.

(he was also very cool in nature)

#### F2F Round 3 :

1. Discussion on my projects and work in current company.

2. Given a general stack, design an advanced DS, such that getMin(),getMax() happens in o(1). Many cross questions on this. about optimizations and all.

Then HR told me that all my interviews went well and they will call me for last round of Interview.

#### Last F2F round (Bar Raiser):

1. Given a file having many lines of text(words) and given a dictionary having an API function boolean isValid(String word), which will return true if a word passed to this function is valid word in dic.,and will return false if given passed argument is not a valid word in dic.

Now read the file and check if each word as well as all possible words from its L to R and R to L combinations, are valid words in dic. or not.

e.g. say first line in file is "My name is Gourav", then in the word NAME, the possible valid words are NAME, AM(L to R), ME(L to R), MAN(R to L), AN(R to L).

I implemented this simple questions in java code and used Hashmap to avoid processing of already processed words.

2. Why Amazon ?

3. Extraordinary work done in company which was out of scope of your designation.

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## GATE CS Corner Company Wise Coding Practice

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Amazon

## Amazon Interview Experience | Set 261 (For SDE1)

I had around 1 year and 9 months of experience.

#### Telephonic Interview :

It started with a brief introduction of mine and my work. Then he asked me a coding question

1) Given a linked list eg : 1->2->3->4->5->6, make the following changes

1->6->2->5->3->4

Easy but it was lengthy. Had to write production level code.

After 2-3 hours, I got an invitation for in house interview at Amazon campus:

#### Round 1 : Face 2 Face

It started with a discussion about my previous work and projects. After the discussion he asked the following technical questions:

1) Given a pre-order traversal, construct a binary search tree.

<http://www.geeksforgeeks.org/construct-bst-from-given-preorder-traversal/>

Simple solution. Asked me to code it.

2) Given an alien dictionary, find the order of the alphabets in the dictionary.

Only the approach was required. I explained him the approach and he was satisfied. Here is the link to the code anyway:

<http://www.geeksforgeeks.org/given-sorted-dictionary-find-precedence-characters/>

3) Connect n ropes with minimum cost

<http://www.geeksforgeeks.org/connect-n-ropes-minimum-cost/>

I was asked to write production level code for the above problem.

#### Round 2 : Face to Face

Again the interview started with a discussion about my projects and then he asked a technical question.

1) Given m sorted arrays with n elements, merge these arrays into one sorted array of size m\*n

I did hear about this question before but never really saw the optimized solution so I gave a O(m\*m\*n) solution. He asked me to optimize it, but I wasn't able to do so, hence he asked me to code the O(m\*m\*n) solution. I took a lot of time to code it as I wanted to handle all the edge cases. Finally I coded it. He didn't find any issues but he asked me to make it better. And then I suggested using heaps to get the minimum of all the m arrays.

Lot of questions on why heap and why not BST. Asked me to prove it mathematically.

But he was satisfied once I gave the solution using heaps.

<http://www.geeksforgeeks.org/merge-k-sorted-arrays/>

#### Round 3 Bar Raiser : Telephonic

Discussion on my previous projects and asked some behavioral questions like why are you leaving your current company, conflicts with your manager etc

Technical questions:

1) Find the maximum element in an array which is first increasing and then decreasing

<http://www.geeksforgeeks.org/find-the-maximum-element-in-an-array-which-is-first-increasing-and-then-decreasing/>

2) Find the Pythagoras triplet in an array

Gave an O(n<sup>3</sup>) solution then made it O(n<sup>2</sup>logn). He asked me to optimize it even further.

Finally came up with O(n<sup>2</sup>) solution <http://www.geeksforgeeks.org/find-pythagorean-triplet-in-an-unsorted-array/>

3) Given a very large binary number which cannot be stored in a variable, determine the remainder of the decimal equivalent of the binary number when divided by 3

I had no clue about this question. He gave me a hint, with which I was able to solve it. But later, he asked me to find the remainder for any number k. Again he gave a hint and I was able to solve it.

Basically when we append a digit to a binary number, the previous binary number gets doubled, hence the remainder also gets doubled.

For example : 101 -> 5

1010 -> 2\*5 + 0 = 10

1011 -> 2\*5 + 1 = 11

If k = 3 then

5 = 1\*3 + 2

2\*5 = 2\*3 + 2\*2

Hence the remainder will be

(2\*2 + 0)%3 = 1 for 1010

Similarly for 1011 the remainder

will be (2\*2 + 1)%3 = 2

By keeping track of the remainder of the previous binary number, the current remainder can be determined.

#### Round 4 Hiring Manager: Face to Face

Behavioral questions along with some questions about my previous projects.

Then he gave me a technical question:

1) Given a number say '1234', return the number in words i.e One thousand two hundred and thirty four

Was able to cover all the scenarios. He was satisfied with my approach

#### Suggestions:

Think loud and be confident. It's okay if you don't know the answer at first. They mostly see how you solve questions for which you don't know the solution.

Thanks geeksforgeeks. You guys are doing an awesome job.

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## GATE CS Corner Company Wise Coding Practice

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## Amazon Interview Experience | Set 260 (For SDE2)

Online Coding Round:

1. <http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>

2. <http://www.geeksforgeeks.org/largest-rectangle-under-histogram/>

1st Round:

1. <http://www.geeksforgeeks.org/sum-of-two-linked-lists/>. I gave recursion solution code. Then asked for optimized one.

2nd Round:

1. Detail overview of current project. roles and responsibilities.

2. Implementation of Queue but with certain kind of constraints. Basically looking for knowledge of design patterns.

3rd Round:

- Again went through resume and asked every point.
- <http://www.geeksforgeeks.org/maximum-sum-path-across-two-arrays/>
- List all possible test cases.
- Design a dashboard system. both HLD and LLD.

4th Round:

- Design a system to upload images and tag them, ability to search images with two or more tags particular tags.
- Most challenging work
- <https://www.careercup.com/question?id=5638261762424832>

5th Round (Bar Raiser):

- Most challenging work
- Why Amazon?
- Why leaving current company?
- <http://geeksquiz.com/stack-set-4-evaluation-postfix-expression/>
- Design a online shipment tracking system.

Note: In all they asked for production ready code. Please take care of all edge case.

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## GATE CS Corner Company Wise Coding Practice

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### Amazon Interview Experience | Set 259 (1 Yr Experienced for SDE1)

**Round 1:** It was a written round with three question.

Q1) Find a peak element. <http://www.geeksforgeeks.org/find-a-peak-in-a-given-array/>

Q2) Top View of binary tree. <http://www.geeksforgeeks.org/print-nodes-top-view-binary-tree/>

Q3) Maximum difference between node and its ancestor in Binary Tree. <http://www.geeksforgeeks.org/maximum-difference-between-node-and-its-ancestor-in-binary-tree/>

**Round 2 (F2F):**

Q1) Given an array of distinct integers, find if there are two pairs (a, b) and (c, d) such that a+b = c+d, and a, b, c and d are distinct elements. If there are multiple answers, then print any of them. Expected complexity : O(n<sup>2</sup>)

**Ex :** 3,4,7,1,2,9,8

**Output :** (3,8) and (4,7)

Q2) Lowest Common Ancestor in a Binary Tree <http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>

In both the questions, they needed a proper working code covering every edge cases.

**Round 3 (F2F):**

Q1) If I am designing a media player and I want to store songs and play them in random order

a) What data structure will you use to store songs?

b) How will you select the next song to play in a way which prevents the same song being played in consecutive turn.

I spend some time and finally came up with the working solution.

Q2) Clone a binary tree with random pointers. <http://www.geeksforgeeks.org/clone-binary-tree-random-pointers/>

(Hint: Use HashMap)

**Round 4 (Telephonic) :**

Q1) Tell me about yourself. Your current company, your role and responsibilities. Reason for leaving current company.

Q2) Maximum triangle path Sum : Starting from the top of a pyramid of numbers like below, you can walk down going one step on the right or on the left, until you reach the bottom row:

55
94 48
95 30 96
77 71 26 67

One of such walks is 55 -> 94 -> 30 -> 26. You can compute the total of the numbers you have seen in such walk, in this case it's 205.

Your problem is to find the maximum total among all possible paths from the top to the bottom row of the triangle. In the little example above it's 321.

Q3) Design your own Process Control Block(PCB).

Q4) Give me an example of a project that didn't work out well?

Q5) What are some of the things that you and your supervisor have disagreed about?

**Round 5 (Telephonic) :**

Q1) Tell me about yourself. Your current company, your role and responsibilities.

Q2) Asked about the challenges faced in your current company. Did you ever have a boss that you did not like or get along with?

Q3) Check for balanced parentheses in an expression. <http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>

I was asked to write code as well on collabedit site.

Q4) Move all zeroes to end of array. <http://www.geeksforgeeks.org/move-zeroes-end-array/>

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## GATE CS Corner Company Wise Coding Practice

Experienced  
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### Amazon Interview Experience | Set 258 (For SDE1)

**Round 1:**

It was a written round with three questions :

1. Find a row with maximum number of 1's in a sorted 2D Boolean matrix.
2. Find next greater element for every element of an array to its right in O(n).
3. Convert a sorted array to binary search tree.

**Round 2:**

1. There is a linked list which is sorted based on their absolute values. Sort them based on their actual values.

Eg., input : 1 -> -2 -> -3 -> 4 -> -5 output: -5 -> -3 -> -2 -> 1 ->4

2. Reverse a linked list.

3. Given a 1D array where each cell represents a toll gate ticket value. Find the minimum number of tickets needed to surpass the whole array (means till u reach the end of array) .

If ticket value is 1 then u can pass that cell alone. If ticket value is 2 u can pass that cell and the next cell.. that is how ticket values work.

Eg : Input : 3 1 5 4 1 1 1 Output : In this case if v buy ticket from a[0] and a[2] meaning two tickets are enof to pass this array..

**Round 3:**

Only one question was asked :

1. Convert a BST to sorted doubly linked list without any extra space. (only ptrs to nodes should be created ,no new node creation is allowed.)

**Round 4:**

Telephonic Round:

1. Tell me about yourself
2. Print the boundary of a tree.
3. There are billions of URL given. Come up with an efficient data structure that returns ip address of these urls.
4. Trie data structure

I was asked to send the code snapshot within five mins after ending the call.

**Round 5:**

1. Tell me about yourself
2. Projects and Internship
3. Given a tree where each node has an additional ptr called "next" ptr. Initially this next ptr of every node is null. Write code such that each node's next ptr should point to its next bfs node.
4. Trending tab related question: Given a large stream of strings, return the top 10 most frequently occurring string . (Hash map + min heap of size 10 is the solution.)

**Round 6:**

1. Tell me about yourself
2. Why do u like Database Mgt System (I had DB in my areas of interest)
3. Design the backend of a social networking application (Eg : linked in)
4. All OS related qns
5. Network qns
6. OOPS concepts with real time examples.
7. General technical questions.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 257 (Off-Campus)

I was recently interviewed by Amazon, Bangalore for SDE position. It was an off campus drive in Delhi for TRMS team.

## Written Test :

- Q1) Find a peak element. <http://www.geeksforgeeks.org/find-a-peak-in-a-given-array/>
- Q2) Top View of binary tree. <http://www.geeksforgeeks.org/print-nodes-top-view-binary-tree/>
- Q3) Maximum difference between node and its ancestor in Binary Tree. <http://www.geeksforgeeks.org/maximum-difference-between-node-and-its-ancestor-in-binary-tree/>

## Round 1 (F2F):

Q1) In a sorted array every number is present twice, only one number is present one time. You have to find the number occurring once. Expected complexity : O(log N)

Ex : 101, 101, 200, 200, 301, 450, 450

Output : 301

Q2) Clone a binary tree with random pointers. <http://www.geeksforgeeks.org/clone-binary-tree-random-pointers/>

In both the questions, they needed a proper working code covering every edge cases.

## Round 2 (F2F):

Q1) Next greater element. <http://www.geeksforgeeks.org/next-greater-element/>

Q2) You have been given a grid with some doors, walls and some empty spaces.

1st part : You have to tell the least no of moves to go from random position in the grid to the nearest door. You can move in four directions only, i.e, left, right, above, below.

Ex: D - door, W - wall

		D	
W			W
	D		
			D

2nd part : Least distance of every empty cell to the nearest door. Lots of discussion was done on both the parts of the problem.

I spend some time and finally came up with the working solution using Breadth first traversal.

Q3) Find Excel column name from a given column number. <http://www.geeksforgeeks.org/find-excel-column-name-given-number/>

This was the toughest round.

The interviewers had their flight to Bangalore and were getting late. So, next two rounds were telephonic.

## Round 3 (Telephonic) :

This round was taken by hiring manager.

Q1) Tell me about yourself. Your current company, your role and responsibilities. Reason for leaving current company.

Q2) A 100 coin puzzle.

Q3) What happens after you write "a.out" and press enter. He wanted to know the functionality performed by the OS after executable file is created of your code.

Q4) What happens when your code encounters NULL?

Q5) Garbage collector in Java. How is it different ?

## Round 4 (Telephonic) :

Q1) Tell me about yourself. Your current company, your role and responsibilities.

Q2) Asked about the challenges faced in your current company. Any situation where you were in disagreement with your manager. Any innovative or unique work performed in the current company.

Q3) Connect nodes at the same level. <http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

Proper working code was expected covering all edge cases. They shared the collabedit link.

Q4) What is Lock? Asked about semaphores, virtual memory, process scheduling.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 256 (Written Test for SDE1)

Recently i had an online test at hackerank platform for Amazon SDE1 position.

Following are the questions

1. Given an unsorted array, trim the array such that twice of minimum is greater than maximum in the trimmed array. Elements should be removed either end of the array.

<http://www.geeksforgeeks.org/remove-minimum-elements-either-side-2min-max/>

2. Given a value V, if we want to make change for V cents, and we have infinite supply of each of C = { C1, C2, .. , Cm} valued coins, what is the minimum number of coins to make the change?

<http://www.geeksforgeeks.org/find-minimum-number-of-coins-that-make-a-change/>

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### Amazon Interview Experience | Set 255 (On-Campus)

Amazon visited our campus. It started with a online coding round and followed by one telephonic and then 3 face to face interview and again a telephonic interview. All interview rounds started with brief introduction about me.

#### Round 1(Online Coding Round):

Asked 2 coding question and 20 mcq from Computer science fundamentals (OS, DS, DBMS, Networks etc.)

- 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.

**Input:** arr[] = {2, 0, 2}  
**Output:** 2

<http://www.geeksforgeeks.org/trapping-rain-water/>

- Check whether two strings are anagram of each other.

<http://www.geeksforgeeks.org/check-whether-two-strings-are-anagram-of-each-other/>

#### Round 2 (Telephonic round):

- Tell me about yourself.
- Vertical Sum in a given Binary Tree

<http://www.geeksforgeeks.org/vertical-sum-in-a-given-binary-tree/>

- Project Discussion

#### Round 3 (f2f onsite):

- Tell me about yourself.
- Sort a linked list of 0s, 1s and 2s

<http://www.geeksforgeeks.org/sort-a-linked-list-of-0s-1s-or-2s/>

- Find duplicates in O(n) time and O(1) extra space.

<http://www.geeksforgeeks.org/find-duplicates-in-on-time-and-constant-extra-space/>

#### Round 4 (f2f onsite):

- Design a data structure that supports insert, delete, search and getRandom in constant time

<http://www.geeksforgeeks.org/design-a-data-structure-that-supports-insert-delete-search-and-getrandom-in-constant-time/>

- Given a continuous input stream of integers, can you find the maximum N numbers at any given instance?

<https://www.quora.com/Programming-Puzzles-Given-a-continuous-input-stream-of-integers-can-you-find-the-maximum-N-numbers-at-any-given-instance>

- lca of k nodes in given bst

- K'th largest element in a stream

<http://www.geeksforgeeks.org/kth-largest-element-in-a-stream/>

- Lowest Common Ancestor in a Binary Search Tree.

<http://www.geeksforgeeks.org/lowest-common-ancestor-in-a-binary-search-tree/>

#### Round 5 (f2f onsite):

- Floor and Ceil from a BST

<http://www.geeksforgeeks.org/floor-and-ceil-from-a-bst/>

- Find the two numbers with odd occurrences in an unsorted array

<http://www.geeksforgeeks.org/find-the-two-numbers-with-odd-occurrences-in-an-unsorted-array/>

- Find the Number Occurring Odd Number of Times

<http://www.geeksforgeeks.org/find-the-number-occurring-odd-number-of-times/>

- Project Discussion

#### Round 6 (Telephonic round):

- Tell me about yourself.
- Most proudest moment in last one year.
- Most regretted moment in last one year.
- Asked about what data structure and algorithms did i know then asked what is segment tree.
- Reverse the stack using recursion

<http://www.geeksforgeeks.org/reverse-a-stack-using-recursion/>

- External merge sort

[https://en.wikipedia.org/wiki/External\\_sorting](https://en.wikipedia.org/wiki/External_sorting)

- Project Discussion

Really want to thanks geeksforgeeks for providing great platform for learning.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 254 (Off-Campus for SDE1)

I got a call from amazon for opening in SDE – I. It started with a online screening round and followed by one telephonic and then 3 face to face interview and again a telephonic interview.

#### Online screening :

There were 20 multiple choice questions from Computer science fundamentals (OS, DS, DBMS, Networks etc.) and basic input/output questions, some aptitude questions and 2 coding questions:-

1. Given an array find the minimum difference between any pair.
2. Write a function that returns true if a given undirected graph is tree and false otherwise. <http://geeksquiz.com/check-given-graph-tree>

#### Telephonic Interview :

Interview started with brief introduction about me and my projects, then started with coding questions.

1. Given two trees return yes if the order of leaves in tree are mirror image of each other.
2. Given an array of n numbers. another array with same elements but numbers are shuffled and one element is removed. Find the missing element.(without using any extra space and in O(n) ).

Then if both the array are sorted then how to find the missing element. (without extra space and in O(log n)).

Then they called me for onsite interview and 3 face to face interview were conducted there.

#### Face-to-Face Interview 1 :

He started with a brief introduction and asked me my about my projects in detail.

then moved to coding questions:-

1. Arrange Linked List elements in zig-zag pattern such that

a c e .....

(without using extra space and Time complexity O(n)).

Don't forget to handle edge cases.

<http://www.geeksforgeeks.org/convert-array-into-zig-zag-fashion> (This is array implementation of same question).

2. Given a binary tree. return sum of all Left Leaf nodes.

Left leaves meaning leaf node which is left child of his parent.

<http://www.geeksforgeeks.org/find-sum-left-leaves-given-binary-tree/>

#### Face-to-face Interview 2 :

1. Given two nodes of a binary tree,check they are cousins or not. (Both Iterative and recursive solution).

<http://www.geeksforgeeks.org/check-two-nodes-cousins-binary-tree>

2. Given an array with N elements (numbers from 0 to N-1). Find all duplicate elements.

I gave a solution with hashing, he asked me to do without extra space.

Then I gave solution with sorting the array, he asked me to do with only single traversal and without extra space.

#### Face-to-face Interview 3 :

Started with brief introduction and some questions from my projects and CS fundamentals (OS,Networks).

- 1.Given an input string and a dictionary of words, find out if the input string can be segmented into a space-separated sequence of dictionary words.

<http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem>

#### Telephonic Interview :

The interviewer asked me to introduce myself, and after that he asked some behavioural question like-

Have you got offer from any other company ?

Why are you intersted in joining AMAZON ?

1. Design a Elevator. How you store the input from users inside the elevator, outside the elevator. How the elevator will take decision whether to go up,down or stop.

2. There is an event in the auditorium and Given capacity of the auditorium (NxM).

every group of person booked ticket and all the tickets are booked, Now you have to assign seat number to all of them such that minimum number of group split.

We can solve this using this <http://www.geeksforgeeks.org/dynamic-programming-subset-sum-problem>.

Thanks a lot geeksforgeeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 253 (For SDE1)

Amazon Bangalore location. Part of weekend interview drive in March 2016.

Role: SDE1

3 rounds – all three very similar in pattern. Workout algorithm and write production ready code.

## 1st round:

2 questions:

1. In a BST, replace value of each node with the sum of itself and everything greater than itself.
2. There are two very large numbers, cant fit in any data type provided, so they are given in a linked list (one digit per node). Sum the two numbers.

## 2nd Round:

2 questions:

1. Clone a linked list with random pointer.
2. In an integer array, find the window with maximum sum.

## 3rd Round (Bar raiser):

Mostly non-technical questions like challenges faced, and conflicts with colleagues etc.

Tech question: implement Linked hash map using Linked list and hash map.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 252 (For SDET)

I got a call from amazon for the opening of SDET. It all started with telephonic interview asking brief introduction and 2 questions.

1. rearrange a linked list in such way that all odd position nodes are together and all even positions node are together, 1->2->3->4->5->6 , convert it ot 1->3->5->2->4->6

## Face-to-Face 1st Round

1. Random play a song from a list of given songs in such a way that no songs is repeated until all the songs are played
2. Distance between two nodes of a given binary tree

## Face-to-Face 2nd Round

1. Find out whether a tree is subtree of given tree or not
  2. For a given array find max of k sub-array, i.e if array is 1, 2, 3, 4, 5,6,7,8 ,9,10, then function should return an array of size n-k+1 with each element be the max of k elements
- output : 3 (max of 1, 2, 3), 4(max of 2,3,4), 5(max of 3, 4, 5) etc, array is not sorted

## Face-to-Face 3rd Round

1. Automating an api to getAllFriendListFromFacebook for a given email id.

**Face-to-Face 4th Round** 1. vertical sum of a binary tree, he was looking for in place solution. just 1 traversal and without using hashmap as hashmap allocates more size than the elements to store. interviewer gave hint to use doubly linked list to store the sum.

## Face-to-Face 5th Round

1. Given a binary tree return a matrix where mat(i,j) is 1 when i is an ancestor of j. only one traversal required and no extra space required, idea is to populate ancestor list as we process nodes and update the matrix

Thanks & Regards

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 250

## ROUND 1(Technical):

I initially had a telephonic interview where it started with my basic intro and some questions about my current work. He then asked a couple of binary tree related questions:

- 1.1 Check if a given binary tree is BST or not.
  - 1.2 In a BST, each node has an additional attribute 'score' along with the value. You need to write two functions:
    - a. Update(value, newScore) -> update the score of the node with value 'value' to the newScore
    - b. SubTreeScore(value) -> get the sum of scores of all nodes in the subtree with node having the value 'value' as the root
- Interviewer wanted O(logn) solution for Update and O(1) for SubtreeScore function. We are allowed to change the structure of the node to add additional attributes
- c. Discussion on the above solution for the case where nodes are deleted from the tree(How to still have O(1) solution for SubTreeScore)

After this round, I immediately got a call for next round, which was an on-site interview event

#### ROUND 2(Technical):

Around 30-40 candidates appeared for interviews on-site on that day and it all started with a written coding test having 3 questions:

2.1 Level-order traversal for a binary tree

2.2 Don't remember it exactly, something to do with pair-wise XOR operation for an array. I could only give an  $O(n^2)$  solution for this.

2.3 Given a matrix, with each node having a value. You start from 0,0 and have to reach n,m. From i,j you can either go to i+1,j or i,j+1. When you step on each block, the value on that block gets added to your current score. What's the minimum initial score you must carry so that you can always reach n,m(through any possible path) having positive score at the end.

Eg: Matrix -> 2 3 4  
-5 -6 7  
8 3 1

Ans -> 6 – for path 2,-5,-6,3,1 we need initial score of 6 so that when we land on 1, we have a positive score of 1

After this everyone had a max of 3 interviews the same day, subject to qualification of each round.

#### ROUND 3(Managerial):

Around 80% of the interview was about my current job and tiniest details about everything.

Design an automobile system -> two/three/four wheeler, petrol/diesel/gas, gear/non-gear and classifications like this

How will you detect when a keyboard/mouse is attached to the computer? I said we will have kind of listeners that listen to a port continuously and act accordingly. He insisted on a solution without listeners. Had a good 5 mins discussion on this.

#### ROUND 4(Technical):

4.1 Linked list containing characters as values. Find if a linked list is palindrome.

4.2 Building Bridges Problem

4.3 Bottom View of binary tree

#### ROUND 5(Technical):

5.1 pow(a,b) needed to cover each and every case possible

5.2 LRU cache implementation

5.3 Given an array of numbers, form the largest number possible by concatenating all of them. Needed to return a string.

After this, I was told that I can leave for the day, but next week will be called again for an on-site-interview.

#### ROUND 6(Hiring Manager):

Again, 70-80 % of the time spent on my current work, minute details of each and everything along with typical behavioural questions like hurdles faced, disagreement with manager, conflicts and others..

Reverse a linked list again covering all possible scenarios

Some easy problem on binary tree (don't remember exactly what)

After this I had to wait for almost a week for their call, where I was asked to appear for another interview.

#### ROUND 7(Bar-Raiser):

Started with some behavioural questions like Why Amazon, why leave prev company along with current job role details.

Longest Palindromic Substring in a string. The interviewer was satisfied with the first solution that I suggested, asked me to code the same, and was convinced with the code too, although I did make a small mistake which I realized later.

Initial intent was to ask two such questions, but I guess time restriction forced it to just one.

Thanks a lot geeksforgeeks. The Amazon sets here did help a lot in the preparation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Count Negative Numbers in a Column-Wise and Row-Wise Sorted Matrix

Find the number of negative numbers in a column-wise / row-wise sorted matrix M[][]]. Suppose M has n rows and m columns.

Example:

**Input:** M = [-3, -2, -1, 1]  
[-2, 2, 3, 4]  
[4, 5, 7, 8]

**Output :** 4

We have 4 negative numbers in this matrix

We strongly recommend you to minimize your browser and try this yourself first.

#### Naive Solution

Here's a naive, non-optimal solution.

We start from the top left corner and count the number of negative numbers one by one, from left to right and top to bottom.

With the given example:

[-3, -2, -1, 1]  
[-2, 2, 3, 4]

```
[4, 5, 7, 8]
```

#### Evaluation process

```
[→, →, →, 1]  
[→, 2, 3, 4]  
[4, 5, 7, 8]
```

Below is Python implementation of above idea.

```
# Python implementation of Naive method to count of  
# negative numbers in M[n][m]  
  
def countNegative(M, n, m):  
    count = 0  
  
    # Follow the path shown using arrows above  
    for i in range(n):  
        for j in range(m):  
  
            if M[i][j] < 0:  
                count += 1  
  
            else:  
                # no more negative numbers in this row  
                break  
    return count  
  
  
# Driver code  
M = [  
    [-3, -2, -1, 1],  
    [-2, 2, 3, 4],  
    [4, 5, 7, 8]  
]  
print(countNegative(M, 3, 4))
```

Output :

```
4
```

In this approach we are traversing through all the elements and therefore, in the worst case scenario (when all numbers are negative in the matrix), this takes O(n \* m) time.

#### Optimal Solution

Here's a more efficient solution:

1. We start from the top right corner and find the position of the last negative number in the first row.
2. Using this information, we find the position of the last negative number in the second row.
3. We keep repeating this process until we either run out of negative numbers or we get to the last row.

With the given example:

```
[-3, -2, -1, 1]  
[-2, 2, 3, 4]  
[4, 5, 7, 8]
```

Here's the idea:

```
[-3, -2, ↓, ←] -> Found 3 negative numbers in this row  
[↓, ←, ←, 4] -> Found 1 negative number in this row  
[←, 5, 7, 8] -> No negative numbers in this row
```

```
# Python implementation of Efficient method to count of  
# negative numbers in M[n][m]
```

```
def countNegative(M, n, m):  
  
    count = 0 # initialize result  
  
    # Start with top right corner  
    i = 0  
    j = m - 1  
  
    # Follow the path shown using arrows above  
    while j >= 0 and i < n:  
  
        if M[i][j] < 0:  
  
            # j is the index of the last negative number  
            # in this row. So there must be (j+1)  
            count += (j + 1)  
  
            # negative numbers in this row.  
            i += 1  
  
        else:  
            break
```

```

# move to the left and see if we can
# find a negative number there
j := 1
return count

# Driver code
M = [
    [-3, -2, -1, 1],
    [-2, 2, 3, 4],
    [4, 5, 7, 8]
]
print(countNegative(M, 3, 4))

```

Output :

4

With this solution, we can now solve this problem in  $O(n + m)$  time.

This article is contributed by **YK Sugishita**. 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.

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

## GATE CS Corner Company Wise Coding Practice

Matrix  
Amazon  
Matrix  
Python

## Amazon Interview Experience | Set 249 (Telephonic Interview)

Telephonic interview:

1. Given a string, display the words in reverse order

I/p: I work at xyz

O/p: xyz at work I

2. Given a linked list modify the linked list as below

I/p: a x b c y z

O/p: a b c x y z

3. What is virtual memory

4. If I am designing a media player and I want to store songs and play them in random order

a) what data structure will you use to store songs ?

b) how will select the next song to play in a way which prevents the same song being played in consecutive turn

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 248 (4.8 Yrs Experience for SDE II)

### 1. WRITTEN ROUND

- Given lengths(costs) of ropes, find the total minimum cost of creating a single rope. (cost of two ropes = length1 + length2)
- Find all the diagonal sums of a binary tree

### 2. F2F

- Design Movie tickets booking system
  - Class diagram with all relevant classes & associations
  - find out all use cases
  - describe a typical flow of events
  - show how each use case is handled using your class diagram (selection of seats, payment etc)
  - how would system be designed such that you can show the user complete cinema hall with all seats in their respective locations.
  - write a service for a front end controller which will let users to select multiple seats according to their preference. Already booked seats & available seats should be marked differently.
  - how will the cost of a booking be determined (I used decorator pattern for it)

### 3. F2F

- About projects I had worked on; current task; few questions on the current task
- Challenges faced when an urgent action was required from my side during the project life cycle. What were the problems, how I tackled it, how I implemented its solution

3. Architecture (design) of the project I had worked for the longest period of time.
  4. Other tasks I had done: Batch jobs & REST web services. Questions around them
  5. Design a system having multiple jobs, interacting with each other such that (use a DAG for this problem):
    1. a job can run for very long periods (1-2 days)
    2. a node can fail/crash on which certain job is running
    3. system should be scalable
    4. amount of data getting transferred is huge
    5. data in the system is very sensitive and needs security
    6. job/s can fail
4. F2F
1. About projects, current task
  2. Design a system for a Building having various Access Points & Users having multiple levels of access
    1. Class diagram with all entities, relationships
    2. how will you achieve scalability? (handle the system when the number of users accessing it is very high at the same time)
    3. write all the necessary services required
    4. how will you handle the scenario when a person misplaces his card
    5. how will the scenario for visitors entering the building be handled?
5. Telephonic
1. Tell about all your projects you have worked in your career till now and your role and contribution in each.
  2. Reasons for switching earlier from previous company to current, project with in the company and now to Amazon
  3. Toughest situations handled, your role, your solution, how feasible was it
  4. Process of tackling highest priority issues, solutions, implementation, approvals and end result.
  5. Flow of events in a typical development and release cycle.
  6. Coding question (first design & then code on collabedit). Problem Statement:  
 You are given n number of mutually exclusive jobs with their schedules (time of running) that need to be run on m number of nodes. Find minimum value of m such that all jobs can run in their respective times. Optimize your solution.

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## GATE CS Corner Company Wise Coding Practice

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## Amazon Interview Experience | Set 247 (For SDE 1)

Round 1:	Coding Round on paper
	1 <a href="http://www.geeksforgeeks.org/sum-of-two-linked-lists/">http://www.geeksforgeeks.org/sum-of-two-linked-lists/</a> 2 <a href="http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/">http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/</a>
Round 2:	
	1 Tell me about yourself?? 2 <a href="http://www.geeksforgeeks.org/find-the-row-with-maximum-number-1s/">http://www.geeksforgeeks.org/find-the-row-with-maximum-number-1s/</a>
Round 3:	Hiring Manager
	<p>Have you use what's app, there are some hints come when we start type. How these hints are coming. He asked me</p> 1 to design my own code so that I can show the hint based on number of count of particular word that I am using??  2 A lot of discussion on above question and he shows me how amazon maintain their product recommendation feature.
Round 4:	
	1 <a href="http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/">http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/</a> 2 <a href="http://www.geeksforgeeks.org/minimum-number-of-swaps-required-for-arranging-pairs-adjacent-to-each-other/">http://www.geeksforgeeks.org/minimum-number-of-swaps-required-for-arranging-pairs-adjacent-to-each-other/</a>
Round 5:	Telephonic (Bar raiser)
	1 A lot of discussion on my projects. 2 Most challenging thing you have done in your both company?? 3 Disagreement with your manager? 4 Is there any thing you develop which initiated by yourself?? 5 Any time when you have to finished your work in short span of time? 6 Did you find any difficulty working with a team?? 7 <a href="http://www.careercup.com/question?id=6109164921159680">http://www.careercup.com/question?id=6109164921159680</a>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 246 (For SDE 2)

I was recently interviewed by amazon for SDE 2 position. Here is my experience.

#### Round 1:

I was asked to solve 2 questions.

1. Spiral printing of 2D matrix.
2. Given an array of 0s and 1s . I was asked to return the index of a zero turning which will produce a longest continuous 1s.

Ex 1 0 1 1 0 1 0 1 1 1 0 1. here turning the last 0 to 1 will form 5 ones. this is the longest of all.

#### Round 2:

In this round I was asked to solve 4 question.

1. basic implementation of stack.
2. finding the middle element of a linked list
3. printing the vertical sum of a tree.
4. given an array of integers where the number go increasingly and at a point will start decreasing something like the following.

2 3 4 5 6 7 8 6 4 3 2.

we need to find the turning point of this series. in this example it is 8.

#### Round 3:

Given 2 design problems

1. I was asked to design a s/w for game shop in shopping mall.

Description: The game shop will distribute preloaded cards. That card needs to be used to play any game. If the card has balance the cardholder will be allowed to play the game.

2. Design chessboard. I was asked to write all the classes.

#### Round 4: (Hiring Manager)

Detailed discussion about project. Discussion about my current responsibilities in the current company and details around that.

and lot of behavioral questions.

#### Round 5: (Bar Raiser)

Detailed discussion about the interesting problems I've faced in my past projects. The interviewer went deeply inside the project and asked questions.

I was asked to solve a problem. Given a binary tree, I was asked to serialize that tree and store it as a file format and retrieve it back to the form of a binary tree.

I was initially saying preorder and in-order delimited by a pipe symbol. But the interviewer asked me to go with only one traversal. I finally gave a solution using only preorder, denoting null nodes as \*.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 245 (For 2.5 Years Experienced)

### Round 1:

Q-1 Given an array of 0s and 1s, and another input m, I was supposed to tell the longest continuous streak of 1s after flipping m 0s to 1s. E.g., Array is {1,1,0,0,1,1,1,0,1,1} m = 1 (which means I can flip 'm' one 0 to 1)

Answer: 6 (If we flip 0 at index 7, we get the longest continuous streak of 1s having length 6)

Q-2 Given N ropes of lengths L1, L2, L3, L4, ..., LN. I had to join every rope to get a final rope of length L1 + L2 + ... + LN.

However, I can join only two ropes at a time and the cost of joining the two ropes is L1 + L2. I was supposed to join ropes in such a way that the cost is minimum.

### Round 2:

Q-3 Given a BST, I needed to serialize it and deserialize it. This essentially boiled down to generating the "traversal" string and getting the BST back from the traversal.

Q-4 There are two linked lists. Both linked lists have a single-digit number in their nodes. I needed to treat this linked lists as numbers and add them up and store the digits in a new linked list.

E.g., head -> 5 -> 6 -> 7 -> 9

head -> 2 -> 1 -> 1

Resultant linked list: head -> 5 -> 8 -> 9 -> 0 (5679 + 211 = 5890)

### Round 3: Hiring Manager round

Q-5 Project discussion in detail. Most challenging problem, how did you solve it, had any disagreement with manager, how did you fix it etc.

Q-6 Given an array {2, 4, 6, 0, 1, 8, 1}, where each element represents the height of tower located at its index. I was supposed to tell how much maximum water can accumulate in this "valley" once it rains.

### Round 4:

Q-7 Given the encoding rule:

A -> 0

B -> 1

C -> 2

...

K -> 10

...

Z -> 25

I was supposed to get the number of original strings possible given an encoded input.

E.g., Given input 10, two possible original strings are BA and K, the answer is 2.

Q-8 Given two trees, find out if the second tree is a "subtree" of the first one.

E.g., Tree 1

A

/ \

B C

/ \ \

D E F

/

G

Tree 2:

B

/ \

D E

/

G

Answer: Yes (B is a subtree of A)

**Tree 2:**  
B  
/ \  
D E

Answer: No (Tree 2 is not a subtree of Tree A)

#### Round 5: Engineering manager round

Q-8 Engineering Manager round, all behavioral, why do you want to leave the company, one challenging problem, how did you overcome it, your biggest failure etc. etc.

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## GATE CS Corner Company Wise Coding Practice

Experienced Interview Experiences Amazon

## Amazon Interview Experience | Set 244 (For SDE-1)

#### ROUND 1 (Telephonic, 70 mins):

1. Given an array, print the greatest element on right side, for elements having no greater element print "-1" ..
2. Given a binary tree, print its boundary traversal..
3. Given a m\*n matrix, find the number of paths to reach m\*n from 1\*1..

After Round 1, I was asked for In House Interview SDC Hyderabad.

#### ROUND 2 F2F (60 mins):

1. Given a mountain array and some obstacles in array, check if there is a way to reach the end cell from beginning cell..
2. Design a phone book, make search as efficient as possible.. Only approach was required on how will we store multiple numbers, multiple websites, multiple email ids etc and how will we search efficiently.. Many approaches were discussed: Linear Search, Binary Search then TRIE.

#### ROUND 3 F2F(60 mins):

This round was easy, i think just to check my coding skills.

1. Given an array, find one pythagoras triplet..
2. Given a binary tree convert it to its mirror tree..
3. Given an n-ary tree convert it to its mirror image..
4. A 1-D puzzle. I could not answer it as only 7-8 mins were given to me, but at last Interviewer asked my approach before leaving, she said yes I am on the right track but left as Interview time was over.

#### ROUND 4 F2F (Hiring Manager, 60 mins) :

1. Asked full explanation what i am currently doing in my company.. Asked me to explain on the whiteboard..
2. Given a large file, that cannot be loaded into the memory, with 2 fields, ItemId and its description. Entry contains the list of all items sold on amazon.in. Track the most sold item item at any instant.  
I could not answer this question efficiently, I tried to explain him with MinHeap, he then said to go ahead and code. I did, but there were some flaws. But he was satisfied with the approach i took to solve the problem.
3. Design a network packet class.. Class designing for Request, Response and Timeout Packets.
4. Some behavioral questions, like tell me a time when you helped a colleague, a time when you were helped, what should you improve in yourself etc..

#### ROUND 5 F2F (Sr. Manager, 75 mins):

1. Asked about my current project in full detail, many questions why do we make this product, whats the use, who uses it, for what etc..
2. Design a contact list, full production level working code was required for all methods. How will we store the contacts, what classes will we use, how will we search.

So we should display all the matched contacts whenever we press some characters..

Suppose when we open contact list and it have many contacts like (....Saransh Santa Sarcastic Secular Sharma Start ..... )

So if we type S , the screen displays all contacts with "S" then when we type "Sa", screen must display Saransh Santa Sarcastic.

#### Suggestions:

1. **DO NOT** mug up the code. Understand it.
2. If stuck, ask interviewer for hints, they are very co-operative.
3. Prepare Data Structures(expecially Arrays, Trees, DP, Linked List, Stack, Queues, Strings, Heaps, Hashing for Amazon).
4. You should be flawless at explaining what you are currently doing and your past projects, future is a reflection of past.

At last Thank you GeeksforGeeks for helping me through this.

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## GATE CS Corner Company Wise Coding Practice

## Amazon Interview Experience | Set 243 (2.5 Years Experience)

### Coding round (1 hour):

1. <http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>
2. <http://www.geeksforgeeks.org/sum-of-two-linked-lists/>

### Face to Face Round 1 (Technical ~ 1 hour)

1. Introduce yourself and give me a brief about what projects are you doing currently?
2. What was the challenge you have faced in your current project?
3. Given a running stream of integers. I need to find the median of the running stream. I gave solution using heaps. He was interested in the approach using tree, after a hint i was able to solve it using tree. He was convinced by my approach
4. Design a data structure in which the operations like insert , delete and finding minimum element should be done in O(1) time complexity. I told him that i have already done this question so he was just interested in logic.
5. Given n non-negative integers representing an 2-D elevation map where the width of each bar is 1, i need to compute how much water it is able to trap after raining.

**Input:** arr[] = [0, 1, 0, 2, 1, 0, 1, 3, 2, 1, 2, 1]

**Output:** 6



Trap "1 unit" between first 1 and 2, "4 units" between

first 2 and 3 and "1 unit" between second last 1 and last 2

### Face to Face Round 2 (Technical ~ 1 hour 10 min)

1. Introduce yourself and tell me the most challenging project you have done in your career. Lots of discussion on project part and challenges i have faced.
2. Given an unsorted array which contains unique numbers from 0 to 999 and size of array is 1000. At one of the index the element has been replaced by some other element. I need to find the original element. Only logic was required.
3. An infix expression is given and i need to evaluate this expression. I told him that this is standard question, so he just asked me the logic and ask me to convert the infix expression to post fix expression.
4. An binary tree is given. He asked me to serialize and deserialize the given binary tree. I gave him the approach using pre order traversal and store the elements in array and using another array which will store whether a node element is leaf node or internal node. He was convinced with the approach. Then he asked me to write the code for the same logic.
5. Discussion on what data structure i will use to implement recommendation engine. e.g. if someone buy mobile from Amazon, it should recommend the ear phones, power bank etc. It was a good discussion.

### Face to Face Round 3 (Bar Raiser ~ 1 hour 30 min)

1. Trapping rain water question was asked again. I did not tell him that i had already done this question in my first interview round. Eventually he came to know that i had done this question already. So he asked me another question.
2. Given a 2-D plane and number of points are given on that 2-D plane which are represented by its (x,y) co-ordinates. So i need to find the maximum number of points which can be lie on a single line.  
Answer : I gave the solution using hashing, i calculate the slope using any two points, now one by one checks the slope with other points if slope matches i will increase the count for that particular slope in hash map. Now i will traverse the hash map and find the maximum. Time complexity  $O(n^2)$ .  
Then discussion happens on what if slope comes out to be something that can even not be stored in type "long double", what to do then.
3. LRU cache implementation. I told him that i knew the answer already. So he asked me a different question.
4. Given an array of integers. I need to modify the array so that each index of array contains product of all elements except for the its own index element. Twist is that i need to do it without using division(/) operator. I was able to solve it with a little hint.
5. Given a post order traversal of a binary search tree. He asked me to write a clean code to create a BST using the given post order traversal and return the root of the BST.
6. Given a stream of characters which can contain only alphabets [a-z]. I need to find the whether there is a duplicate element present or not and accordingly return true or false. He was interested in the worst case time complexity.

### Telephonic Round 4 (Hiring Manager ~ 1 hour)

1. Introduce yourself and give me a brief career background of yours.
2. Why you have left your previous company?
3. Why you are leaving your current company so early?
4. Why Amazon?
5. What is the most challenging thing you have done in your entire career? Give me the implementation details, what was the situation and how have you handled it?
6. Tell me a situation when you have suggested your manager a better idea of solving a problem and he has to go back and used your idea and done the things again.
7. Tell me a situation when your manager has disagreed to your ideas and why?
8. Given a sorted and rotated array. I need to find the search the given element in this array. Expected time complexity was  $O(\log n)$ .

### TIPS

1. Practice to write the code using pen and paper.
2. Keep trying to solve the problem, they will definitely give you hints wherever you stuck and you can capitalize on those hints to solve the problems.
3. Be honest with the interviewer.

Amazon people were friendly all during the process.

A Big thanks to geeksforgeeks for making everything easy.

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## Amazon Interview Experience | Set 242 (1 Year Experience)

### Telephonic round: (1 hour)

It is started with interviewer introduction followed by my introduction. Need to write the code in shared docs. They shared CollabEdit link before interview.

- 1) <http://www.geeksforgeeks.org/minimum-number-platforms-required-railwaybus-station/>
- 2) <http://www.geeksforgeeks.org/given-an-array-of-numbers-arrange-the-numbers-to-form-the-biggest-number/>

After one week, they called me to Hyderabad office for on-site interview. They have arranged everything.

Every round started with interviewer introduction followed by my introduction.

End of every round, interviewer asked "Do you have any questions"?

### Round-1: (1 hour, 2 interviewers)

- 1) Questions related to my exp, projects and my role, architecture of my projects
- 2) can we construct a tree with single traversal? NO  
which traversal is must needed ? INORDER. Why?

Then he asked <http://www.geeksforgeeks.org/construct-a-special-tree-from-given-preorder-traversal/>

- 2) <http://www.geeksforgeeks.org/next-greater-element/>

### Round-2: (1 hour 45 min, 1 interviewer)

- 1) Multiplication of two numbers without using multiplication operator.

2) He explained a situation like you have super market and items sold every day, blah blah... finally the question becomes as follows

Given a file which contains one product id per line(millions of products) which are sold and some product ids may repeat. We need to find how many items are unique in that file. (i.e sold uniquely)

- 3) Cycle in a LL
- 4) How we can implement a queue with one pointer

5) Given a key , search the key in the LL, if exists swap the values of prev node and current node. After I given solution then he asked me swap nodes NOT values.

6) Given a binary tree, construct a MIRROR of that tree.

So many behavioural questions around 10 -15 questions. some are

Give me an instance

- clashes with Teammate
- when you shared your team mate burden
- your PM doesn't agree with your opinion
- if time is less for the project, how you will handle
- What you have done to increase team efficiency
- big mistake you have done in the team
- your are moved to new team but you dont have any exp with that technology. how you will handle?
- you team mate is not working properly because of that you are working more time. how you will handle the situation?
- you came with idea but team doen't agree
- What are the areas/technonoloies which you want to improve?
- blah, blah, ... so many

### Round-3: (1 hour, 2 interviewers)

They said that first we will go with technical questions then related to exp and projects.

- 1) Given an array find the missing numbers. Array is not sorted and range of elements also not known.

Ex: input: a[]={1, 100} output: 2,3,...99

input a[]={100,1} output: 2,3,...99

Then they asked algorithm for

- if only one number missing and range 1 to n
- if array sorted and one number missing

- 2) Given a two nodes in a binary tree, check those are cousins or not. Cousins means both have to present in same level but doesn't have a common parent.

They wants within a single traversal of a tree we need to find. (2 traversal of a tree also not allowed. I have done in two traversal )

They given hints and finally we solved it.

- 3) Related to heaps

- how you will insert a value, what is the time complexity
- how you will delete a value, what is the time complexity
- how you will construct a heap with a given array, what is the time complexity

### Round-4: (1 hour, 1 interviewer)

He is senior most guy. I felt a little bit uncomfortable.

- 1) Asked about current projects and my role and related to exp.

- 2) He explained a scenario as follows:

Amazon has so many products which are selling outside. Given a millions of products and he can tell how to construct a URL with product id to get the product details page which contains info about product, ratings and commnets, blah blah.

Ex: if product id is 123456 then the URL becomes www.amazon.com/product/123456

Then questions are as follows

- Retrieve the rating for each product(ex:123456) which is present in that page (ex: www.amazon.com/product/123456)
- After finding ratings for every product(millions of products). Give an algorithm to find top 10 rated products. Asked me to write production level code NOT pseudo code.
- Then he extended if product ratings are same (it may occur for some product) then we need to consider the product which has more number of comments
- Time complexity for above cases

- 3) Why you want to leave current job?

**Suggestions:**

- 1) **Need to cover (order is high to low priority):** Trees, Heaps, sorting and searching, LL, Stacks, Queues, strings, DP, Greedy, Divide and conquer, hash map and collisions, recursion and back tracking, bit manipulation, basic graph algorithms, OOD, scalability and memory units, any missing topics.
- 2) You should know the time complexity for STL data structures.  
Ex: For hashing, we will say we can find a value in O(1) but if we are using C++ STL, map was implemented with Balanced BST so it will take O(logn).
- 3) You **MUST** prepare some behavioral questions, atleast standard questions like Why Amazon? Why do you want to live?
- 4) Practise on paper because you need to write on paper in all rounds of interview.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 241 (1.5 years experience)

#### Round-1 (World Trade Centre, Bangalore) – Technical

1. Given an array that is first increasing then decreasing, find an element in it.  
Example: arr[] = { 2,6,8,9,15,20,18,16,12,7,1}; x = 12, Find x.
2. Print left view of a binary tree.
3. Given an array that contains only 1, 2 and 3. Sort the array. He asked me to write code for two methods – counting method and Dutch National Flag algorithm.
4. There is an irregular, haphazard, shapeless cake that needs to be divided equally among n people. Say you are one among them. How do you achieve consensus?

#### Round -2 (Q-city, Hyderabad) – Bar raiser

1. About projects, your contribution, your roles and responsibility, challenges faced etc.
2. Why amazon?
3. Given a pattern containing only Is and Ds. I for increasing and D for decreasing. Devise an algorithm to print the MINIMUM number following that pattern. Digits from 1-9 and digits can't repeat.

**Example:**

1. Input: D      Output: 21
2. Input: I      Output: 12
3. Input: DD     Output: 321
4. Input: II     Output: 123
5. Input: DIDI    Output: 21435
6. Input: IIDDD   Output: 126543
7. Input: DDIDDIID Output: 321654798

#### Round – 3 (Q-city, Hyderabad) – Technical

1. Given pre-order traversal of a BST. Construct the BST.
2. Given a m\*n matrix. m and n can be huge. We need to query the matrix for sum of submatrices. Input will be the top-left and bottom-right co-ordinates. We need to return the sum of submatrix in O(1) time.  
Solution: Do column wise sum of the matrix and store it. Again, do the row wise sum and store it.

#### Round – 4 (Q-city, Hyderabad) – Managerial

1. About projects, your contribution, your roles and responsibility, challenges faced etc.
2. Given m sorted arrays, merge it into one array.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 240 (1.5 Year Experienced for SDE-1)

I recently had interviews with Amazon. Here's my interview experience

#### Coding round on Hacker rank (1 hour):

1. Find minimum number of coins that make a given value

Given a value V, if we want to make change for V cents, and we have infinite supply of each of C = { C1, C2, .. , Cm} valued coins, what is the minimum number of coins to make the change?

2. Suppose you have given two strings S1 and S2. Find out if S1 is substring of S2. If S1 is present in S2 return starting index of S1 in S2 and if not present return -1.

3. <http://www.geeksforgeeks.org/find-two-rectangles-overlap/>

#### Face to Face Round 1 (Technical ~ 1 hour)

1. LCA in a BST. [Lowest Common Ancestor in a Binary Search Tree ...](#)
2. Swap two nodes in a singly linked list. [Swap nodes in a linked list without swapping data ...](#)
3. Building bridges problem Dynamic Programming | Set 21 (Variations of LIS ...)      [algorithm – Building bridges problem – how to apply longest ...](#)
4. Implement a data structure with push() , pop() , find minimum element in O(1).      Design and Implement Special Stack Data Structure | Added ...      ( For each question they asked me to write the code and also tell all test cases.)

#### **Face to Face Round 2 (Technical ~ 45 mins)**

1. Find the number of islands. [Find the number of islands – GeeksforGeeks](#)
2. Calculate how many paths exist from top left to bottom right corner of matrix with cost = k. [Number of paths with exactly k coins – GeeksforGeeks](#)      (For each question they asked me to write the code and also tell all test cases.)

#### **Face to Face Round 3 with Hiring Manager (Technical ~ 1hour)**

1. Tell me about yourself.
2. Given 4 digits , find the sum of all the 4-digit numbers that can be formed using these 4 digits. [SOLUTION: Find the sum of all four digit numbers that can ...](#)
3. Merge two balanced BST's. [Merge two BSTs with limited extra space – GeeksforGeeks](#) (For each question , code and a dry run was expected)
4. Tell me a situation when your manager disagreed with you.

#### **Telephonic Round 4 (Technical ~45 mins) ( held after some 3-4 days )**

This interview will be taken by some senior guy who doesn't belong to the team you are hired for.

1. He gave his brief introduction and then asked mine.
2. Why do you want to leave the current company
3. Why Amazon?
4. The most challenging project/thing ever done. Why it was challenging . How would u do the same project/thing again. i need to tell some improvements in previous approach/design/code.
5. Tell me a situation when your manager disagreed with you / or had a different opinion
6. Tell me a situation when there was a time constraint for project delivery and how you handled it.

7. Find an element in a rotated sorted array. [Search an element in a sorted and rotated array ...](#) (The collabedit link was shared to me through the mail but it didn't work during the interview . So the interviewer asked me to just explain the logic)

Some suggestions:

1. Practice Trees , Linked lists , DP , Arrays , Strings , Stacks , Queue , Hashing , Heaps , Backtracking and basic Graph questions from gfg. The questions are asked as it is.
2. Don't just look at the solutions , write the whole code on paper while practising.
3. In the interview , start from the less optimized solutions and then move to more optimised solutions.
4. Practice the latest 20-25 sets from the Amazon Interview sets in gfg
5. Ask questions / take hints from the interviewers.They are co-operative.
6. Prepare behavioural questions like why leaving , why amazon , situation against manager etc. Have answers to these questions ready .Practice speaking them to yourself before the interview, otherwise you might get nervous.

A big thanks to gfg for making everything easy.

All the best folks! Prepare well.

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## **GATE CS Corner Company Wise Coding Practice**

# Amazon Interview Experience | Set 239

I recently attended an interview with Amazon at WTC, Bangalore

## Round 1 – Written (write code for any 2 out of 3)

1. Given an array of elements which is first increasing and then decreasing, find the maximum element in the array.
- Points where based on how we handle the corner cases like what if we have only two elements in the array.
2. Given a string of parentheses, find if the expression is balanced or not ?
3. Given a binary tree, find the level which has maximum number of nodes, consider root as level zero

People were asked to write 2 or 3 lines about the approach they follow, the space and time complexity, data structures used to solve the problem

I attended 1 and 3 – scored 7/10, on my further analysis I had failed to handle the corner cases in question.3

## Round 2 – Face to Face discussion

1. Write program to escape URL string, say you are given a URL string, you have to replace  
"(space)" -> "%20"  
"(double quotes)" -> "%d"

say http://www.google.com/hello world" -> http://www.google.com/hello%20world%5d

what is the space and time complexity, can we accomplish the solution with only one traversal of the string ?

2. Given a million of points(x,y) in a two-dimensional plane and a utility function to compute the distance from Origin, how will you return the smallest k distances from the Origin.

Answer : Use Comparator and sort the array, return first K elements from the sorted list

Follow up: why do we need to keep all elements in the sorted list, how can we maintain only k elements in the sorted list ? Time, space complexity of the solution. time complexity of the problem.

## Round 3 – Face to Face discussion

3. Implement hash map of your own

Follow up:

1. How to handle a collision situation
2. How can we reduce the time complexity of rehashing process ??

Gave my best in this round but couldn't clear it.

Amazon people were friendly all during the process.

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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 238 (For SDE)

**First round** was HackerRank test:

Your job is to write a method that will take a stream of integer values, and put them into a tree while counting the number of times each value is seen. The first value from the given list should occupy the root node. Then you need to traverse the tree breadth-first to generate a string representation of the tree. Values are to be inserted into the tree in the order that they are given.

**Second Round** was an Event at a hotel where 5 interviewers each took about 45 min for a session of Q &A:

1. Find the missing number in the increasing sequence. i.e. :  
input: 1 2 3 5 6 7 output: 4. Tell the complexity.
2. Tell YES or NO if two binary trees have the same numbers (could be of different structures, non-unique elements)
3. Find the nth from frequent character in string (any character)
4. TPM guy: Design an elevator system (one lift, maybe more)
5. 1. Design a Messenger like Facebook or Whatsapp  
2. Given 1M U.S. phone numbers (10 digit), choose a data structure/method for the most efficient search. Tell the complexity.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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# Amazon Interview Experience | Set 237 (For Application Engineer)

## 1) Written Test on Unix Shell Scripting

1. write a script/command to find files older than 7days and zip them and move to specific folder.
2. Asked write some examples on CUT

3. sked to write some examples on awk

## 2) Written test on core java

1. Binary search
2. Hash map program
3. Psudo code for binary search algorithm

Thanks and Regards

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 236 (Rounds 2 and 3)

## Round 2: Paper written coding

- 1) Given an unsorted array with a group of characters taken from the user. Find the first occurrence of non repeating character and print the character(s).
- 2) Write a program to find whether the two given two strings are ANAGRAMS or not. ( built-in function should not be used )
- 3) Find the number of words in a given paragraph and find the required word needed by the user and replace that word with an other word given by the user.

## ROUND 3: TECHNICAL HR AND HR

\*) Tell about your self

- 1) Given an string. Find the number of times a given character from the user is repeated in the array.
- 2) Given two arrays in sorted manner, you need to multiply one two numbers i.e., one from each such that the pair is like the first number is taken from first array should be the largest number and the second number is taken from second array should be the smallest number. The desired product and the values in the array should be taken from the user first and accordingly produce the result.
- 3) what will you do if your facebook page doesn't get logged in? Derive the maximum number of test cases that you will perform to check the login page of facebook.
- 4) what will you do if you set the alarm clock to ring at a particular time and it doesn't ring? Derive the test cases and try to debug the issue
- 5) what will you do to check whether the facebook page UI is working perfectly on all sorts of screen sizes and browsers. Derive the test cases
- 6) What will you do if you have an issue in sending a mail after clicking the SEND button. Derive the test cases.
- 7) what are the test cases to check whether your whatsapp is running properly or not ?
- 8) write a program to sort the numbers using singly linked list.
- 9) what will you do to check the response time of a webpage and also the derive the test cases if the webpage doesn't load completely.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 235 (For SDE-II)

GeeksOfGeeks has helped me a lot, so, thought of making a little contribution from my side.

## Amazon Interview for Position SDE II

### Round 1:

The interviewer explained about his role and team. He asked questions below,

1. Tell me about yourself and a little bit about your project
2. Design a software to make a reservation at a chain of restaurants. All restaurants are in same Timezone. (He just wanted the class diagram)

### Round 2:

Again, the next interviewer explained briefly about himself and asked about me and my role in the current project. He asked more details about current projects

1. Given an array of stock values of a company. Find out the time when a user would have bought the stock and sold the stock. Basically find the maximum positive difference of any two given elements in an array?
2. Told me to write this program.

### Round 3:

Interviewer introduced himself and asked about my details and my current projects.

1. You have a BST and you need to assign an appropriate value to neighbor of all nodes (Explained in below example)

```

Node Structure
node {
    node leftChild,
    node rightChild,
    T data,
    node neighbor
}
A
/
B   C
/ \   \
D   E   F

```

Based on above tree,

Node: Neighbor

A: NULL

B: C

D: E

E: F

Told me write a program (It's suppose to be recursive method)

#### Round 4:

- Given a price rules of parking and start time and end time of parking. Calculate the price (Below is the table of price rule) Come up with data structure you can store these price rules PriceRule

Price Rules:

On Weekday	On Weekend		
Hours	Price	Hours	Price
0 – 2	\$5	0 – 2	\$8
2 – 6	\$10	2 – 6	\$13
6 – 12	\$15	6 – 12	\$18
12 – 24	\$20	12 – 24	\$25

The interviewer asked me to come up with an architecture for a system which shows the parking spaces available near customers' location in a mobile app.

#### Round 5:

This round has been just behavioral questions,

- What would you do when the manager disagrees with your decision even though you have a valid point?
- What are the challenges you have faced in your career? How did you resolve it?
- Explain the instance where you have contributed towards making the improvement in your project or team.
- What would you do when your peer disagrees with your decision? How would you resolve the conflicts?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 234 (For SDE-II)

#### Round 1:

- Twitter design considering following functionalities:
  - Post tweet
  - Get the top tweets from the followers
- Parking Lot design

#### Round 2:

- Common elements from n sorted arrays
- Given list of dictionary words. Find minimum number of trials to reach from source word to destination word where word traversal is allowed through 1 letter difference.

Eg: List of words - {ABC, ACD, BBC, BCC, BCD,  
BDC, ABD, BDE, AGF}  
ABC -> BBC -> BCC (3 steps)  
ABC -> ABD -> ACD -> BCD -> BCC (5 steps)

#### Round 3:

- pow(a,n) function – recursive, iterative
- Given list of cities, find the number of tour combinations (not permutations)
- BookMyShow design

#### Round 4:

- Questions on Projects
- next hight number with same digits

#### Round 5:

- Given stream of numbers, at any point of time, need to print first non-repeating digit
- News paper & Magazine subscription design.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 233 (1 Year Experienced for SDE-1)

I recently had interviews with Amazon.com, Bangalore.

Here's my interview experience**Coding round (1 hour):**

1. Find minimum number of coins that make a given value

Given a value V, if we want to make change for V cents, and we have infinite supply of each of C = { C1, C2, ... , Cm} valued coins, what is the minimum number of coins to make the change?

2. Suppose you have given two strings S1 and S2. Find out if S1 is substring of S2. If S1 is present in S2 return starting index of S1 in S2 and if not present return -1.

3. <http://www.geeksforgeeks.org/find-two-rectangles-overlap/>

**Face to Face Round 1 (Technical ~ 1 hour)**

1. <http://www.geeksforgeeks.org/reverse-alternate-k-nodes-in-a-singly-linked-list/>
2. <http://www.geeksforgeeks.org/length-of-the-longest-valid-substring/>

**Face to Face Round 2 (Technical ~ 1 hour)**

1. <http://www.geeksforgeeks.org/design-a-data-structure-that-supports-insert-delete-search-and-getrandom-in-constant-time/>
2. <http://www.geeksforgeeks.org/bottom-view-binary-tree/>
3. <http://www.geeksforgeeks.org/dynamic-programming-set-18-partition-problem/>

**Telephonic Round 3 (Hiring Manager ~ 45 minutes)**

1. Tell me about yourself.
2. Why do you want to change your current company? Why Amazon?
3. <http://www.geeksforgeeks.org/find-a-pair-with-given-sum-in-bst/>

**Telephonic Round 4 (Bar raiser ~ 1.30 hour)**

1. He gave a brief description about him.
2. Tell me about yourself.
3. Why do you want to change your current company? Why Amazon?
4. How Have You Gone Above and Beyond in Your Work?
5. Tell me about your current Projects. What is your role?
6. Some basic OS concepts
7. Then he gave a C code snippet and asked me what this piece of code does? What the problems that you see in this code? Fix the bug in the code.
8. Write your own function to take string as input from user.

For each question I was asked to write production level code. I had to wait for 2 days for the results. I got selected. Thank you geeksforgeeks !!

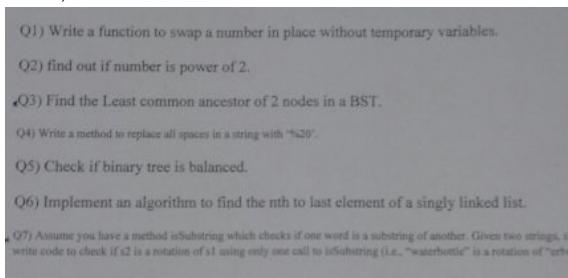
## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

### Amazon Interview Experience | Set 232 (SDE-1 for 1 Year Experienced)

**Interview 1:**

Before the interview began we were asked to solve 6 questions (see below image) and in the first interview i was asked how i solved Q4) replace all spaces with '%20' and Q6) nth node from the end of a linked list.



and then we discussed in details about a project I did with my previous employer.

and then He asked a few questions ->

Q1) [Dynamic Programming | Set 21 \(Variations of LIS\) – GeeksforGeeks](#) -> 1. Building Bridges: Consider a 2-D map with a horizontal river passing through its center. There are n cities on the southern bank with x-coordinates a(1) ... a(n) and n cities on the northern bank with x-coordinates b(1) ... b(n). You want to connect as many north-south pairs of cities as possible with bridges such that no two bridges cross. When connecting cities, you can only connect city i on the northern bank to city i on the southern bank.

Q2) [Write a C program to print all permutations of a given string – GeeksforGeeks](#) -> Print all permutations of a string

Q3) Given the arrival and departure time of various trains in a station. Calculate the minimum number of platforms required such that no train has to wait for another train to vacate the platform.

The question basically means calculate the maximum number of trains that would be present in the platform at any given time.

#### Answer

sort the arrival time and sort the departure time, keep a count initialized to 0. compare the first element of the arrival time with the first of departure, increase the value of count if the value at current Index at arrival is less than the value index at departure and increment the arrival index, and vice versa. Keep the maximum count that you see.

#### Round 2

Q1) given the x,y,z coordinates of a billion stars (basically the entire array can't fit in the RAM) calculate the k closest.

Answer -> use a max heap that contains the k minimum distances.

Time->  $n(\log k)$

then the question was changed to -> now that we have several computers which can combine to fit the entire set of stars, how will you then solve it?

Answer-> use selection algo (similar to step 1 of quick sort) to find the k closest stars in each of the computers. Time ->  $O(n)$  and then use the k in the those m computers to find the minimum k. One way is to sort all them individually. and then create a min heap to calculate k minimum.

$O(k^2 \log k)$

Q2) [Symmetric Tree \(Mirror Image of itself\) – GeeksforGeeks](#) -> How to check if the tree is the mirror of itself

Then the question was extended to a n-ary tree.

Answer -> Please read the above link before reading this answer– We create a the n ary tree like this->

```
struct node{  
    int data;  
    vector < struct node* > child;  
}
```

then we have the number of children of each node as `nodeName->child.size()`;

we use it to compare the first child of the node with the last child, 2nd with 2nd last and so on and follow the steps which were written in <http://www.geeksforgeeks.org/symmetric-tree-tree-which-is-mirror-image-of-itself/>

#### Round 3

Q1) Write a C code to evaluate an expression tree.

Answer-> It has to be done in a post order traversal method, since the value of the left subtree is independent of the right subtree.

Q2) [Articulation Points \(or Cut Vertices\) in a Graph – GeeksforGeeks](#) -> Check for Articulation points

Q3) Given a stream of number, like 1,3,5,4,6,9 print 1,3-6,9

Answer-> create a hash map that contains the value of the ending index of the previous sequence.

```
For example  
when we get 1,3,5 the hash map is  
1 0  
3 1  
5 2
```

key is the number and the value is the index where it occurs.

when we get 4, we have to check for the index of 3 and 5. (One above and one below)

the value at 3 is 1 and 4's index is 3, so they can't be paired.

We then check for 5. 5's index is 2 and 4's is 3, since they are together, they can be paired.

```
1 0  
3 1  
5 2-3  
4 2-3
```

and then we check for 3 again, 3's index is 1 and 4's index is 2-3, so they can match

```
1 0  
3 1-3  
5 1-3  
4 1-3
```

We go on. I don't think I answered the questions the way it was asked, but he seemed ok with the answer I gave.

Next he modified more to include distributed systems in it. And asked me if there were several systems which received the input in round robin manner, how would I implement the above algorithms. I had no idea about this.

After round 3, I was called by Amazon and told that my first two rounds were positive but round 3 wasn't. Round 3 was the hiring manager round, and he wasn't happy that I had little idea about [RAID \( Standard RAID levels – Wikipedia, the free encyclopedia \)](#)

So I had another hiring manager round.

#### Round 4

<http://www.geeksforgeeks.org/find-a-pair-with-given-sum-in-bst/>

Find a pair with a given sum in a bst

more questions on what happened in Round 3 and why I want to leave my current firm.

#### Round 5 (Bar Raiser)

Questions like

1) tell me a time when you had a different opinion than the rest of the team.

2) tell me a time when you were thinking that the problem is something else, but it turned out to be something else

3) tell me a time when your opinion were discarded.

4) tell me a time when you had to work on a very short notice.

Coding questions-

1) given that we can form packs of 6,9 and 20 pens. Given a number x, calculate if we can form combinations of packs to form those many pens. Eg 24 pens can be formed by having 2 packs of 9 pens and 1 of 6 and 23 pens can't be formed.

Answer

Dynamic Programming with the recursive function

$DP[i] = DP[i-6] \cup DP[i-9] \cup DP[i-20]$ ;

2) Design an escalator system. Which classes would you make, etc.

After Round 5, they didn't find me a cultural fit so they conducted a Round 6.

#### Round 6

Questions like- tell me something about yourself,

a time when you helped someone

A time when you shared a different opinion from your manager.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

## Amazon Interview Experience | Set 231 (On-Campus)

We had Amazon campus interview in our college offering an internship (performance based job conversion).

### First round(online coding round) :

20 MCQs.

2 coding questions.

- Given three huge numbers, each represented using a linked list (where each node of a linked list represents a digit), calculate the sum of the numbers and return back the number in the form of a linked list. For example, 9->2->3, 4->6 and 2->5->1 representing numbers 923, 46 and 251 respectively. The result should be 1->2->2->0. This can be solved using stacks.
- Given a graph, detect if it has a cycle. We can perform a dfs here.

### Second round(Technical Interview):

I was asked to explain my work at an internship that I did. I explained for about 10 minutes. I was then given a binary search tree and asked to form a mirror of it i.e. every parent nodes left and right child should be swapped. I wrote a simple recursive code for it.

```
void BST(Node root) {  
    if (root==null)  
        return;  
    Node temp = root.left;  
    root.left = root.right;  
    root.right = temp;  
    BST(root.left);  
    BST(root.right);  
}
```

Given a somewhat sorted array where the numbers are in ascending order first and then follow a descending order, find the index at which the order changes and return the number at that index. For example, i/p: 1234532, o/p: 5. I wrote down a modified binary search for it (had to take care of some corner cases). The interviewer was satisfied and I was sent to the next round.

### Third round(Technical Interview):

I was asked to talk about one of the projects. I spoke about an artificial intelligence project that I did. He asked me some questions based on it. About 15 minutes.

I was asked the same question as the first one in the online round except here I had to add only two numbers. I told him that but he asked me nonetheless to write the code down and explain it. I gave him the recursive solution as well as the easier stack-based solution as a replacement of recursion.

Given positive numbers  $a_1, a_2, \dots, a_n$ , you can sum up the elements in the following way:  $1^*a_1 + 2^*a_2 + \dots + n^*a_n$  where  $i$  ranges from 0 to  $n-1$ . Find the value of  $i$  at which this sum would be the maximum. For example, 5,6,7 the various sums can be  $1^*5 + 2^*6 + 3^*7$ ,  $1^*6 + 2^*7 + 3^*5$ , and  $1^*7 + 2^*5 + 3^*6$ . The answer is 38.

We can solve this in  $O(n)$ . We initially calculate the sum for  $i$  being 0. We make the following observation.

$i=0, \text{sum}0 = 1^*a_1 + 2^*a_2 + 3^*a_3 + \dots + n^*a_n$

$i=1, \text{sum}1 = n^*a_1 + 1^*a_2 + 2^*a_3 + \dots + (n-1)^*a_n$

$\text{sum}1 = \text{sum}0 - (a_1 + a_2 + \dots + a_{n-1}) + n^*a_n$

Generalizing the equation:  $\text{sum}_i = \text{sum}_{i-1} - (a_1 + a_2 + \dots + a_{i-1}) + n^*a_i$ , where  $i$  ranges from 1 to  $n-1$ . The maximum of the  $\text{sum}0$  to  $\text{sum}_{n-1}$  is the result.

Next question, you need to create an application which listens to requests continuously. The application has a common file that it can access. For every request, some information from the file has to be retrieved and returned back. Would you spawn a new process for each request or a new thread. And why? I said thread since the main processing to be done is on a shared resource and by creating threads you do not need to make a copy of the file as such resources can be shared between threads.

What are the scheduling algorithms that you know in operating systems? What data structure would you use for each of the algorithms. I mentioned the following:

First come First Serve : Queue.

Priority based scheduling : Priority Queue.

Shortest job First: Priority Queue ( this scheduling algorithm boils down to priority based scheduling)

Round Robin : Circular Queue. Interviewer told me circular linked list suits the purpose better. I added that circular double linked list would be an even better answer because of more efficient deletion of an ith node. He told me you can do this operation efficiently in a single linked list itself. I thought for a while and agreed with him while also showing him how I would go about doing this operation in a single linked list.

Given a computer with 1Gb ram and a 2Gb ram, the latter one would perform faster. Explain why would having more amount of ram would – in normal circumstances fare better than lesser ram powered computer. Answer : paging. I also told him how in certain computations like external sorting, it would also be more efficient if you have more RAM.

Given a matrix of 1's and 0's, where 1 represents an island and 0 water, find the number of islands formed. The interviewer was expecting me to come up with a dfs solution similar to this one. <http://www.geeksforgeeks.org/find-number-of-islands/> (Unlike the problem given in link, the 1's can be connected only horizontally or vertically). But I had a quick union find(disjoint set problem) solution in mind. Solution : <http://ideone.com/AzvU8m>

#### **Fourth round(Technical Interview):**

I was asked about my internship work, again. I described the same one as I did in the first round. He asked me some questions based on it. We spent about 20 minutes on it.

Print the top view of a binary tree in order, from left to right. I took some time to figure it out. As I was arriving at the solution I kept explaining it out loud. I had previously done a problem on printing right view of a binary tree which had a similar approach. <http://www.geeksforgeeks.org/print-nodes-top-view-binary-tree/>

Given a number n, print all the squares of numbers such that the square is less than equal to n. For example, if n is 30, o/p: 1 4 9 16 25. Do this without using \*,^ or division operations.

If we observe the sequence we get from the output, to arrive at the next number in the sequence, we add the next odd number. So, 0+1=1, 1+3=4, 4+5=9, 9+7=16 and so on.

I have covered almost all of the questions asked to me. I had to wait for more than a week for the results. I got selected

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 230 (On-Campus For SDE)**

Recently Amazon visited our campus and take three rounds for final selection.

**First Round:** 20 MCQs, 2 Coding questions. Platform – HackerRank.

#### **Coding Questions:**

1.Print all possible words from phone digits

<http://www.geeksforgeeks.org/find-possible-words-phone-digits/>

2.A question involving optimization using modified binary search(I do not remember the entire question).

A total of 10 students were selected after this round.The aptitude were simple but coding questions were time-consuming.

#### **Second Round(technical):**

The interviewer asked me three questions one after another.

#### **First question:**

1.print all permutations of a given string.

<http://www.geeksforgeeks.org/write-a-c-program-to-print-all-permutations-of-a-given-string/>

The interviewer asked me the approach only.

2.print a matrix in spiral order.

<http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>

The interviewer asked me directly to code.

3.print the left and right view of a binary tree.

<http://www.geeksforgeeks.org/print-left-view-binary-tree/>

<http://www.geeksforgeeks.org/print-right-view-binary-tree-2/>

The interviewer asked me the approach but did not tell me to code.

It was an easy round and 5 students were selected for Third round.

#### **Third Round(Technical):**

1.Write a program to remove the whitespaces from a given string.

First i told him in  $O(n)$  time complexity and  $O(n)$  space complexity approach but he wanted  $O(n)$  time complexity with constant space complexity. I was unable to do it so he asked me second question.

<http://www.geeksforgeeks.org/remove-spaces-from-a-given-string/>

2. Write a program to find the element which is common in all the rows in a two-dimensional array. I told him using binary search but he wanted more optimized approach but I was unable to do so.

I did not get selected but Overall it was a good interview experience.

I want to thank GeeksforGeeks for such a good and amazing solutions to the back-breaking problems which helped me in the interview .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 229 (On-Campus for SDE)

**First Round:** 20 MCQs, 2 Coding questions. Platform – HackerRank.

#### Coding Questions:

1. A magic number is one that can be represented as a sum of powers of 5. For example  $30 = 5^2 + 5^1$ . Given n, return the nth magic number.
2. Given a set of words as dictionary, find out whether a given string can be formed using any permutation of the words from the dictionary. The words given in the dictionary cannot be altered, more specifically anagrams of the given words cannot be used to form the given string,

#### Technical Interview 1:

1. Given an array which is sorted row wise as well as column wise, how would you find a given element?
2. Given an n-ary tree, print the spiral traversal of the tree.
3. Given an array, and a number K, find the largest of all consecutive windows of the size K. For example, for the array [2, 9, 3, 4, 1, 6] and K = 3, Output: 9, 9, 4, 6.
4. Given an array, you can only ROTATE the array as many times you want. Return the maximum of summation of ( $i * A[i]$ ).

#### Technical Interview 2:

1. Implement a circular queue using an array of a fixed size. Handle all boundary cases. This question was followed by some Operating system questions based on it.
2. Given an array, divide it into two subsets such that the difference between the sum of subsets is minimized. Also, return the subsets.
3. Discussions on the same dictionary problem asked in the online coding round.

#### Technical Interview 3:

1. Given a threaded binary tree with all the threads pointing randomly anywhere, fix all the threads without using any extra space.
2. Questions on operating system, DBMS, automata theory etc.

#### Technical Interview 4:

1. Given a binary matrix (A matrix consisting of only 0's and 1's), where 1 represents land and 0 represents water, Find the number of islands.
2. Given a paragraph and a sentence, find the smallest sub-string in the paragraph which contains all the words in the sentence, return the smallest starting index of the occurrence of such sub-string if there exist more than one sub-strings of the same smallest length.

Project based questions were also asked in between all the interviews.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 228 (On-Campus for Internship)

Amazon came to our campus a week back and procedure was as follows:

#### Round-1-

20 easy MCQ

2 coding questions:

- (a)- <http://www.geeksforgeeks.org/find-next-greater-number-set-digits/> -> even brute force solution is working.
- (b)-Evaluation of post fix expression.-similar to this one <http://geeksquiz.com/stack-set-4-evaluation-postfix-expression>.

Note – Only fight for solving atleast one coding question.If you have not done any coding question then it doesn't matter how many MCQ you have done you can not qualify for next round. I had started with coding question and did 1 question and only 10 MCQ and qualified for next round.

21 candidates were shortlisted.

#### Round 2(Face to Face)(30 min):

Introduce yourself -(Just a formality)

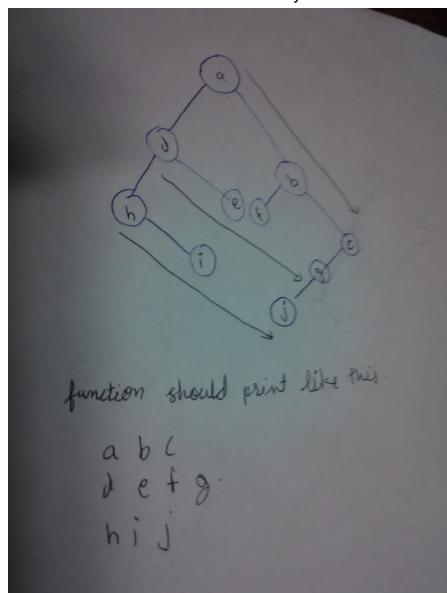
Asked about test and discussed coding question.(Must solve all coding questions before appearing in interview).

Then 2nd question –

1- print a binary tree diagonally. I told him the algo within 2 min then he asked me to write complete code (specially mentioned not pseudo code). It might contain some syntax error but it was not much of a concern. They only see whether you are able to implement the algo properly.

Then he told me there was an error in the code and that it doesn't go correctly to next line.

I told him it's correct lets run manually and check. The code was correct.



2-<http://www.geeksforgeeks.org/find-if-there-is-a-sub-array-with-0-sum/>

I knew its solution and answered the best solution immediately. He asked me if I had done the question previously. I told not exactly same but I like competitive coding so I have done similar question. Then he extended this question and asked to print all sub-array with some zero.(write proper code).

Then he discussed corner cases I told some then he gave some hint and after that I got the idea so, answered all corner cases.

Some questions asked from my friends->

1-<http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/>

2-<http://www.geeksforgeeks.org/find-a-pair-with-given-sum-in-bst/>(expect inorder and reverse inorder solution)

3-<http://www.geeksforgeeks.org/maximum-width-of-a-binary-tree/>

4-<http://www.geeksforgeeks.org/next-greater-element/>

5-<http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>

Note- Same questions were asked by the same interviewer to many candidates so it is advisable to share questions with friends as they select you for next round only if you have done both of the questions.

9 people were shortlisted in this round.

### Round 3(nearly 2 hours)-

1-Given a stream of number how you will maintain top 10 element. Whenever asked, the answer should be top 10 element till now. (answered in 2 min using min-heap).

2-<http://www.geeksforgeeks.org/given-sorted-dictionary-find-precedence-characters/>

very tough question. In 1 hour with the hint of interviewer I was able to answer this.

3- Some basic C questions – What is difference b/w Malloc, Calloc. Scenario when to use which one.

4- Data structure to use for undo and redo in text editor.

I took a lot of time but finally told its answer i.e. stack.

5- Lowest common ancestor of binary tree.(Proper code)

After this round 7 candidates were selected.

**All thanks to geeksforgeeks for helping me with my preparation.**

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## Amazon Interview Experience | Set 227 (On-Campus for Internship and Full-Time)

This year our college kicked off placement season with the Amazon. We got the job description(JD) before the placement process. We got good news that Amazon have increased total CTC. With this good news it also added tension and pressure.

### Day 1: Coding and aptitude round

Coding round was at 5pm so from morning I had revised very basic things like sorting techniques, B Tree, AVL tree, finding the power set and some DP questions.

Online coding exam was of two hours and was on HackeRank. There were 20 multiple choice questions and two programs. Multiple choice questions were GATE type questions mainly from OS, data-structure , algorithm, database and C. My plan was to attempt these questions as early as possible and starts programming but questions were lengthy and it took 30 mins. After 30 mins there were 3 to 4 questions which I skipped and started programming.

#### Program 1: Anagram

Two words are said to be anagram when one word can be converted into another word by shuffling/rearranging characters. Given a set of words find the number of anagram for each word in given set of words.

#### Program 2: Find diameter of binary search tree in O(n) complexity.

Given the set of integer values, insert these values in the binary search tree and find diameter of the tree.

Both the program were easy. I solved program 2 correctly in O(n) and second program in O( $n^2$ ). Result was on next day so all of us were in tension. I could sleep only 3 hours :p.

### **Day2: Interview process**

#### **Interview Round 1:**

Question 1: First question in first round of interview was how to insert node in binary search tree using recursion and without recursion. He asked me to write the code of both.

Question 2: Given a binary tree how to find the least common ancestor of two nodes in the tree.

Question 3: Given a binary search tree find the least common ancestor of the two nodes in tree. He asked me to write the code of this program as well.

Question 4: He asked about projects it has taken almost 10-15 mins.

Time: 45 mins.

#### **Interview Round 2:**

Question 1: He asked me to tell about my self. During introduction I mentioned about my previous company's project. He asked next question about that project. I had worked on that project almost 2 years so I could explain him that project in detail. He asked to write the code for the Wait And Signal method of the counting semaphore.

Question 2: Given an array with -ve as well as +ve elements find max continues sum.

This question was easy.

Question 3: Given a singly circular link list containing both +ve as well as -ve numbers find max continues sum. I explained him O( $n^2$ ) algorithm but he was asking O(n). I was not getting answer of this question. I worked on this for 4 to 5 mins but I was not getting perfect answer so he gave hint by drawing all elements on the circle. As soon as I saw circle I got answer, I told to break the ring from most -ve number and then use normal algorithm which was in 1st question. He was not sure about this algorithm he tried to break this by using 4 to 5 example but he could not. He was happy after this answer because might be he had another solution in his mind.

Question 4: Given prices of stocks per day find maximum profit you can earn by buying and selling shares. You can make only one transaction.

This question is easy and from geeksforgeeks.

Question 5: Given prices of stocks per day find maximum profit u can earn by buying and selling shares. You can make multiple transactions. He asked me to write the code of this program.

Time: 1 hour 10 mins.

#### **Interview Round 3:**

Question 1: He saw my resume and asked me which project I find most difficult. I told same office project. He asked me which part of that project I find most difficult. I told part related to the scheduling. He asked me basic questions related the scheduling and synchronisation.

Question 2: What is copy constructor in CPP

Question 3: Explain the LRU cache technique and how to implement it. I gave various approaches like array, queue , stack, Link list. finally He agreed on Link List with hashing approach. All other approaches were O( $n^2$ ) solution but Link List with hashing approach is O(n). He was happy with that answer.

Link-List with Hashing approach:

Size of LinkList will be size of cache. Data in list represent page number of cache. Before running algorithm we will build Hash Table. Key of HashTable will be page Number and value will be address of the node in link list which contains key. One pointer to Link List represent the most recently used page(Front of Link List) and one pointer will point to least recently used page(End of Link List). When new page come then we will get node containing page number directly from hash table in O(1). After getting that node move that node to the front of link list which represent most recently used page. If the new page not present in the Hash Table then update the value in page pointed by least recently used pointed and move that page to front. and also update key in the hash table.

Here we are building hash only one time and not modifying its values after that.

Time: 50 mins

#### **Interview Round 4:**

Question 1: He asked about projects. I explained him my project in details which took around 10-12 mins. During explanation he was asking like why u have used this approach why not other and like that.

Question 2: Given n Runways and m Planes. How you will efficiently design this scheduling problem so that there should not be collision. I explained this by giving view of CPU scheduling problem and semaphore.

Use priority based Scheduling where priority can be departure time and emergency. Each plane use runways as below:

**Plane Pi:**

**Wait(S)**

**Take off(M.E.)**

**Signal(S)**

S=n

Question 3: This was easy question. Given matrix which is sorted, row wise as well as column wise like below:

01 04 07 09

11 23 45 46  
51 56 59 63  
70 73 75 79

and key. Find the position of key in given matrix efficiently. I explained the solution which is in  $O(\log m) + O(\log n)$ . He asked me write the code this problem.

Question 4: He asked very basic questions of database. After that he asked me what is eventual consistency. I didn't knew answer of this so I told that I don't know, He again asked that do u know about NoSQL I said no.

Time: 45 mins

Thanks to my parents, teachers, friends and GeeksForGeeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience |Set 226 (On-Campus for SDE-1)

Amazon interview experience for SDE-1

#### 1st round (1.5 hrs)

1. given a dictionary of words – {"sam", "samsung", "sung".... }. check if a given string eg. "sungsamsungsam" can be made from the words in the dictionary.
2. magic number is a number formed by adding one or more powers of 5 .find Kth magic number. 5, 25, 25+5=30, 125, 125+5=130, 125+25=150, 125+25+5=155,....
- 20 mcqs having c++, networking, dbms and apti Qs.

#### 1st interview-

0. introduce yourself
1. check if binary tree is BST or not.
2. go from 0,0 to m,n in a 2d matrix. find the maximum possible sum of your path. you can only move down or right.
3. given an array of integers. form pairs such that each pair's sum is divisible by k. return 1 if this can be done, else 0.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience |Set 225 (For 1 Year Experienced)

I recently had interviews with Amazon.com, Bangalore.

Here's my interview experience

#### Written round:

- 1) Insert a number at its correct position in a sorted circular linked list.

For eg:

- a) **Insert 25 in 10->20->30->40->50->10-----**  
o/p : 10->20->25->30->40->50->10-----  
b) **Insert 60 in 10->20->30->40->50->10-----**  
o/p : 10->20->25->30->40->50->60->10-----

- 2) Convert a Binary Search Tree into a Binary tree where value of each node in the tree is equal to sum of all nodes greater than it.

- 3) Clone a Binary Tree with random pointer.

#### Face to Face Round 1 (Technical ~ 1 hour)

- 1) Given an array indicating stock prices on each day for a n days. At any given day,you could:

- a) Buy only one stock.
- b) Sell any number of stock(s) from what you have bought.
- c) Do nothing.

Find the maximum possible profit that you could achieve by doing transactions given the price array for n days.

- 2) Given a  $m \times n$  matrix with LEDs, having each cell representing the state of the LED as either ON(1)or OFF(0). Given a cell position, state of all the adjacent (in all 8 direction) cells sharing the same state as the given cell toggles and the effect cascades. Represent the final state of the matrix.

- 3) Given a deck of n cards, in each iteration the top card is removed and pushed to the end and the second card is removed from the deck. For eg: In 1st iteration, 1st card will added to the end and 2nd card will be removed, again 3rd card will be added to the end and 4th card will be removed and so on. Find the last card which will be remained.

#### **Face to Face Round 2 (Technical ~ 1:30 hours)**

- 1) Given a boolean matrix with every row sorted, find the row with maximum number of 1s.
  - 2) Given a paragraph and two words A and B, find the minimum distance between a occurrence of A and B.
  - 3) Given two valid three letter dictionary words, find the minimum number of steps required to transform first word to second word. Following are the transformation rules
    - 
    - a) You can, in a single step, change a single letter in the word.
    - b) 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.
    - c) This must be done with minimum transitions.
- Example: Transform CAT to TOY. One of the several possible transformations is CAT -> CAR -> TAR -> TOR -> TOY
- 4) Sort a linked list which is in alternating ascending and descending orders.

For eg :

10->60->30->40->50->20 to 10->20->30->40->50->60

- 5) Find the next greater element for each element of an unsorted array.

#### **Some Computer Science Fundamentals now :**

- 1) Explain what happens in the background when you enter "ls" command on unix shell.
- 2) Difference between process and threads.
- 3) What is semaphore and mutex. What is Readers-Writers problem? Explain solution with code.
- 4) Difference between TCP and UDP.

Few more questions which I don't remember now.

#### **Face to Face Round 3 Fa(Hiring Manager ~ 1 hour)**

- 1) Tell me about yourself.
- 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) Scanned through my resume and asked about everything mentioned in it.
- 5) Design question : Design an autocomplete library for a keyboard in a mobile device which does following tasks:
  - a) Autosuggest words while typing from the inbuilt dictionary.
  - b) Suggest words based on your previous inputs:

For eg: If you frequently type "Thank you", so if you type "Thank" then your library should suggest "you" as first result.

I was asked to tell which data structure would I use and write classes and methods for this library.

#### **Face to Face Round 4 (Bar raiser ~ 1:30 hours)**

This round was taken by two guys from different teams and both of them were bar raisers of their respective teams. I was asked to use the whiteboard in this round.

- 1) Both of them gave a brief description about themselves.
- 2) Tell me about yourself.
- 3) Why do you want to change your current company? Why Amazon?
- 4) Tell me about your current Projects. What is your role? Draw the architecture of this project.
- 5) Then one of the interviewer gave a C code snippet and asked me what this piece of code does?

What the problems that you see in this code?

- 6) Connect all the siblings node in a binary tree.

Follow up questions:

- a) Now connect all the non-siblings nodes as well (basically connect all nodes at the same level). ( cousins )
- b) Now write a recursive solution of the same.

I took a long time in coming up with the recursive solution for this question, but eventually solved it.

For each question I was asked write production level code.

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## **GATE CS Corner Company Wise Coding Practice**

Experienced  
Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 224**

Here's my interview experience:

#### **Round 1: Technical**

- 1) A bot has to go from point A to point B. Every time the bot moves, it can take either 1 or 2 or 3 steps. Find the total number of ways in which this can be done.  
Input parameters – distance between A and B  
Required output – number of ways

Had to write error free code with all edge cases covered. First gave a recursive solution and finally came up with a dynamic programming solution

- 2) Implement least recently used cache. This question is there in geeks for geeks. Again had to write error free code.
- 3) don't remember the question. But I just had to come up with an algorithm. Code was not required.

#### **Round 2: Hiring Manager**

- 1) An array contains ones and zeros. Come up with an algorithm such that all ones come on the right side and all zeros on left side. You can go through the array only once – no code required.
- 2) Code for Singleton design pattern
- 3) Many behavioral questions like why amazon, why are you leaving your current company, a situation where you had to go against your manager etc.

#### **Round 3: Technical round**

1) Given a list of words, come up with an algorithm such that all anagrams are separated and placed in their respective buckets. So basically if 2 strings are anagrams of each other, then both should come in the same bucket.

I used sorting and hashing to solve this problem. Code was not required.

2) Given a string of binary digits (for example 010111101000), partition the string in such a way that each segment is a power of 5. If it is possible to partition the string such that at the end there are no digits remaining then return the total number of segments, -1 otherwise. Need to start with  $5^1$  and go up to the max power of 5 that is less than the string.

Had to write proper code for this problem covering all edge cases.

3) Given n people and n+1 parking slots. Each person has a car and a parking slot allocated. One night they all go to a party and get drunk. They end up parking their cars randomly. What's the best way to go back to the initial configuration (one where every car is in the right allocated slot). (N+1)th parking slot can be used to swap the cars.

Only algorithm was needed for this problem.

Come up with a sorting algorithm with  $n \log(n)$  complexity.

Hint: Use Java's comparator class to solve the problem.

#### **Round 4: Bar raiser**

General behavioral questions like what have you contributed to your current project, one thing that you don't like about your project or would like to change etc.

Difference between queues and stacks?

Implement a queue using array such that there is no waste of space even after a few enqueue and dequeue operations.

Hint: Think of circular array.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

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## **Amazon Interview Experience | Set 223 (On-Campus)**

**First Round:** 20 mcqs from quants, os, data structures. they were easy.

2 programming questions to be solved in hackerrank.

**First:** some people are standing in a queue and only even people are selected. Again out of these only even people are selected. This happens until we are left with one. Find out the position of that person in the original queue.

**second:** We have to find the longest possible interval that can be formed by combining certain overlapping or constituent events from the given intervals.

people who solved one question were selected to the next round.

#### **Second round:**

1. find the area of largest possible rectangle from the given histogram.
2. print the boundary leaves of a binary tree.

some 20 odd people were selected.

**Third Round:** Technical Interview. The interviewer is my college pass out. He asked me about my projects very briefly. Then he asked two questions.

1. Given a number give the count of all possible words that can be formed out of it taking the digits continuously. time complexity  $O(n)$ .
2. print the level order traversal of binary tree

**Fourth Round:** Technical interview. three questions were asked

1. find the maximum element in a sorted rotated array.  $O(\log n)$
2. print all the pairs of numbers that sum up to K in a given BST.  $O(n)$
3. sort all the one's and zero's to opposite sides.  $O(n)$

**Fourth round:** basic questions on os, dbms, networks.

Since I had some projects he asked me questions on cloud, and based on my answers the topic got drifted towards distributed computing, etc.

Next round was HR interview.

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## **GATE CS Corner Company Wise Coding Practice**

# Amazon Interview Experience | Set 222

## Aptitude Round: (1:30 hours)

20 MCQs

MCQs on OS, maths aptitude, and algorithms etc . Few output questions on pointers. Do have a look at old GATE papers and you may get some seen questions ☺

2 Coding questions: ( on hackerRank)

- Given an array having positive and negative numbers. Rearrange the array in such a way that positive and negative numbers are then alternate  
Eg – Input : { -3, 1, 5 , 7, -4, -7, -6} Output : {3, 1, -4, 5, -7, 7, -6} (Question demand;ed that order of the elements should not change)  
A similar question is given in geeksforgeeks with O(1) space but that uses quick sort concept which is not stable and hence order gets changed in many test cases.  
I used simple approach of dividing array in two parts of positive and negative numbers and then merging them one by one which worked.
- Convert a tree into it's sum tree  
<http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>

## Interview:

### Round 1:

- Talked something about my projects and introduction.
- A modification of binary search. Eg – 5,5,8,8,9,11,11,13 .. If we give input 8 then it should return index 1 i.e. index of previous element to the first occurrence of the given input number. Even though if the number is not found then also it should work like for input = 12 the answer should be 7.
- Create links in an N-ary tree(N not fixed) into a tree where children of every node are having next pointer connected to it's siblings in a spiral fashion.  
Also on level 1 right most node's next pointer should point to level 2's right most node and in spiral way taking upwards root's next should point to left most child.  
I used two stacks to do the problem. The interviewer asked me to code it, I couldn't complete but she was convinced with my approach.

### Round 2:

- It had easy questions, maybe they wanted to check coding skills for known problems. And also asked about projects.
- Given two strings then check if they are anagrams or not. (Character set is not just 26 alphabets it can special symbols like \$ % ! )  
Also if strings have spaces then also they are anagrams like "adf ds" & "addfs" are also anagrams. I implemented it in Java using HashMap.
- Given two sorted linked lists, merge them into one linked list (Both iterative and recursive code)

### Round 3:

- Tell me about your favorite subjects. I told Data structures & Algorithms , Number Theory & Cryptography. He asked me about different attacks possible on a website page. And asked me about what is man in the middle attack. Maybe he just wanted to check my knowledge on my areas.
- There is a society which has 8 parking slots and there are 7 cars. Each car is supposed to be parked in some fixed position and one slot is needed to be left.  
Example – Let { A , “ , D, E, B, F, G, C} be the perfect arrangement. But society people never follow the rule and park in any position. Your work is to design a strategy which arranges the cars in perfect arrangement at the end of the day having minimum number of swaps. I was able to solve only this one question in this round. I used to strategy that :
  1. I'll first find the empty slot and will check if there is some car should be placed in that place properly and will swap the car.
  2. In case the empty slot is at correct position then I'll find an improperly placed car and place it at empty slot and then will continue with step 1 iteratively till I get the perfect arrangement.

### Round 4:

This was the round with main person who had come with Amazon team. He was taking interview since morning and had seen me with my friends discussing about interviews conducted by him. It was 7:30 in evening when my interview was about to start so while going to room in lift he asked me that if I know any of his questions. I honestly told that yeah I know about a few. He asked me about them and their solutions. One was similar to question 2 of round 1. Another was arranging a list of lists. He said that he will ask new questions now ☺

- Again a modification of binary search : Ex : {c,f,k,v} Now given an input for element we have to print the element next to it in array (even if it is not present)

#### Input Output

a	c
c	f
j	k
v	c

- Then he asked me something about my challenging projects. Some project where I had to do submission in a fixed deadline. Also asked if I take part in online coding competitions.
  - Then he asked simple question of finding maximum sum subarray (Kadane's algorithm). I did it very quickly so he asked another question to find next greater permutation. I gave the algorithm and coded it.
  - Final question he asked that like in github when we save a code it makes commit points. So if some code has been saved multiple times and has many branches divided and then getting merged. We have to find the least common parent of two given commit points.

It is similar to a linked list which is getting divided and then getting merged again number of times.

AA - B - C (divided in two) - D (merged into one) - F - G (divided) --- H - I - J

| ----- E | ----- K - L

**As :**

A - B - C - D - F - G --- H - I - J

\ / \  
E K - L

I have a table given for parents of a node in chronological order and we have direct access to parents too.

Ex – In this case

Node – J I H L K G F D E C B A

Parent – I H G K G F D, E C C B A NULL

Given if I/P is (H, L) the output must be G. It seems similar to LCA concept of trees but it is a slight modification of it. I told about concept of stack that I'll search for given nodes and will then store in two stacks and will pop till I get same value from stack. This popping I'll do according to information of table of node-parent. I was not able to complete it but was able to show my approach and I handled the corner cases. He was satisfied with it.

- I suggest that always listen carefully to interviewer, they'll definitely help if you have any doubt. Tell them your approach at least if you are not able to code it. Practice writing code on paper. Be very careful while you tell about projects. They may get very interested in your projects and it will be very helpful for you. For Amazon Arrays, Linked Lists and Trees are concepts which are very generally asked. Data structures & algorithms should be proficiently practiced. Thanks a lot GeeksforGeeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 221

I gave my round 1 amazon. There were two coding questions.

1) Given an integer n in the input, find its next sparse binary numberA sparse binary number is a number whose binary representation does not contain any consecutive 1s.

For eg.

72 is a sparse binary number, because its binary representation (01001000) does not contain any consecutive 1s.

17 is a sparse binary number, because its binary representation (00010001) does not contain any consecutive 1s.

Similarly,

12 is a non sparse binary number, because its binary representation (00001100) contains consecutive 1s.

43 is a non sparse binary number, because its binary representation (00101011) contains consecutive 1s.

Now, given an integer n in the input, find its next sparse binary number. n itself can be sparse or non sparse.

where n >= 0 and n {1,2,2}

2. You light second and third and extinguish first one . heights ->{1, 1, 1}

3. You light all the candles. heights -{0,0,0}

Hope it helps aspirants.

Online mcq, there were around 20 and 13-14 were from geeksquiz.com

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | 220 (On-Campus)

Amazon visits our campus for recruitment. Here I am sharing my experience of the whole process.

#### Round 1:

First there was an online round on hackerrank and consisted of 20 mcqs and two coding questions.

mcqs were mainly from c/c++ input/output DS, OS .Here are those two coding questions:

Ques1: An array containing heights of building was given. Its a rainy season. Calculate the amount of water collected between all the buildings.

Input: 1 5 3 7 4 2

Output: 2

Ques2: Two strings are given check if anagram of one string is contained in other string.

#### **Round 2(F2F 1):**

Three coding questions were asked, all from geeks.

Ques1: In a party of  $N$  people, only one person is known to everyone. Such a person **may be present** in the party, if yes, (s)he doesn't know anyone in the party. We can only ask questions like "**does A know B?**". Find the celebrity.

<http://www.geeksforgeeks.org/the-celebrity-problem/>

Twist: this time celebrity may or may not know some persons in the party. Suggested him  $O(n^2)$  approach. Using stack we can minimize comparisons.

Ques2: Given an unsorted array that contains even number of occurrences for all numbers except two numbers. Find the two numbers which have odd occurrences in  $O(n)$  time complexity and  $O(1)$  extra space. Told him that I know its approach already. He asked me for the approach.

<http://www.geeksforgeeks.org/find-the-two-numbers-with-odd-occurrences-in-an-unsorted-array/>

Ques3: An array of size  $n-1$  is given contains numbers from 0 to  $n$ . Find the two missing numbers in  $O(n)$  time and  $O(1)$  space. Suggested him method given in :

<http://www.geeksforgeeks.org/find-the-smallest-positive-number-missing-from-an-unsorted-array/>

#### **Round 3(F2F 2):**

He starts with my introduction and some questions on classification as in my machine learning project I have made a classifier.

Ques 1: Find next Greater element for each element of the given array.

<http://www.geeksforgeeks.org/next-greater-element/>

Ques 2: Find if a binary tree is BST or not. Suggested method 3 given in this post.

<http://www.geeksforgeeks.org/a-program-to-check-if-a-binary-tree-is-bst-or-not/>

Ques 3: Given a matrix calculate minimum cost path to reach from top-left to bottom-right. Suggested him the dp approach then he asked me if this will work with negative edges or not. I said yes it would work.

He then twisted the question a bit...now one can move in either of the four direction left,top,right and bottom and can contain negative edges. Suggested him recursive approach having exponential time complexity. Asked me in which case it won't work. After sometime told him if it contains negative cycle. I think it can easily be done with graphs.

Ques 4: coins are lined up (eg. 100 200 50 2) Two players playing this game can pick a coin from either of the left or right end. Player with maximum sum will win. Both players are optimally playing the game. You have to tell that whatturn(1 or 2) should be chosen in order to win. Like in above example if you play first then can select coin 2(you want to get that 200 coin to win).

#### **Round 4(F2F 3):**

He started will "tell me about yourself" and then he asked me about "Virtualization" one of my project. A long discussion on the same. Questions like what happens if he wants to have a trace of his previous work and other project related questions.

Ques 1: Sort a 2GB file line by line. Avoid use of extra space (or use minimum space).

Suggested him solution with trie but he said it would take space if there are no common prefixes. Then i gave him a solution with hashing(store hash value per line and sort it) but he was not satisfied with time complexity) then finally suggested counting sort. As we can have only 256 different characters at max in any line. Time complexity was  $O(n*m)$  n no of lines and m no of characters per line. Satisfied =D.

Ques 2: He gave me a small code to debug. Below code is having four bugs.

Unsigned int;

For(i=100,i<=0,-i)

Printf("%d\n",i);

Ques 3: What happens when you hit your college url. Describe all steps. Then he asked some questions on networks like http, tcp, port, switches etc.

Ques 4: Print all permutations of a string. Asked me for the approach and code it.

#### **Round 5(F2F 4):**

Long discussion on my summer internship project. Project was on "Machine Translation" (translation of one language document into other language). Mine was converting English to Hindi. Asked me for the approach and discussion on the same.

Then he gave me this problem.

There are number of clients requesting pages of a service. Find number of pages requested by clients in each 5 minutes. Gave a solution with queue using linked list and map.

Then a long discussion on my minor project which was on machine learning. The interviewer was having deep knowledge on machine learning So he asked me a lot on the same. Then he asked me if I have studied it as a subject. I said no. He said "that is what I wanted to know". He was impressed with my projects.

Hope this experience would help you to prepare for the company. GFG helped me a lot, a great site with almost all stuff to prepare for the interview. Best of luck J keep coding J

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### Amazon Interview Experience | 219 (On-Campus)

Amazon came to our college. Here is my interview experience. There were total 5 rounds.

#### First Round (1.5 hr)-

It consist of two sections

-> Mcq (20 questions)

-> Two coding questions

1) Given two string Str1 and Str2, Find whether any anagram of Str2 is a sub-string of string Str1 (Case Insensitive) then return True otherwise False.

Test case :if Str1 = Amazon and Str2 = omaz, Output: True

2) Given n non-negative integers representing buildings where the width of each bar is 1, compute how much water it is able to trap after raining

For example,

Given [0,1,0,2,1,0,1,3,2,1,2,1], return 6.

#### Round 2(2 hr)

1. Introduce yourself.

2. Short discussion of project on machine learning as interviewer is working on machine learning stuff.

3. A tree is stored in an array such that value stored at index I is parent of node I. Firstly gave an  $n \log(n)$  approach as it came to mind first. He said to code it (coded it), then he insisted to optimize the solution with worst case time complexity  $O(n)$ , then we discuss the DP solution he agreed on the logic and asked to code it (coded it).

3. Find lowest common ancestor in a binary search tree of nodes A and B. He asked if I have seen this problem already I replied in affirmative, so he asked me to code it quickly, I coded it. But he asked what if node A or B or both are not present, I said this code wont work but we can first check if both nodes A and B present then we can use this code, he was convinced n moved to next code.

5. Find max distance between any two nodes of a binary tree with at most a single bent. We discussed a lot over this question then he asked to code my approach which we discussed, while coding I found it was the wrong one, I told him that this approach wont work. At last he said to leave this problem n moved to next.(only questions I couldn't solve)

6. find loop in LL.

7. find frequency of words in a paragraph I suggested at first a hash than trie n he was satisfied with the answer.

8. Again a short discussion on the project.

#### Round 3(Design questions) (1.5 hr)

1.) Suggest auto correct if a word is misspelt.

i) only one character is replaced by wrong character like cht then suggestion can be cat.

ii) the word written is prefix of other word.

Used trie.

2.) A service is requested by fixed number of customers (limited 5-10). If the service fails at time n. Find frequency of requests made by each customer 10 minutes prior to failure of service. I suggested a DS made up of queue and map.

3.) given a set of classes and their dependencies, return if this given set can be BUILD(compiled) with or without error.

class A:B C

class B:D

class C:E F

class D

class E:A

class F:G

class G:A

return error as classes A,C,E depends on each other.

I said questions same as find loop in a graph he agreed n asked to code.(coded it)

round 4(subject round)(2hrs)

1.) The answer sheets of previous interviews are passed on to next interview as my 3rd interviewer did not have my answer sheet of 2nd interview he asked me about the questions asked to me in the last interview.

2.) consider a service running on a server for a customer c1, but customer c1 times out after s sec for what so ever be the reason so customer again fires the same request, so server is running duplicate query hence it gets overloaded, resolve this glitch. Some how I managed to give a solution which he said is very similar to the solution he himself implemented to resolve this glitch.

3.) given a tree find sum of all the numbers formed by appending the data of nodes from root to leaf node. In a single traversal of the tree.

Eg:

```
1
 / \
2 3
Return 12+13=25
```

I solved it using a reference variable to store final solution and a variable passed as value to store up to current node\*10, thus add data of current node to this variable to get number formed till this node if current node is a leaf then add it to variable passed as reference.

4.) Any idea about scheduling algorithms and there types.

5.) Given a matrix of 0's and 1's, find the maximum size of the square formed by 0's.

1 1 1 1

1 0 0 0

1 0 0 1

0 0 0 0

Return 2.

coded it by flipping all zeros to ones and ones to zeros than ques similar as given on GFG.

6.)what is mutex?

7.)given words of a lexicographical order of an alien language find order of characters in the language.

I said I have seen this problem it is of topological sorting and he proceeded to next question.

8.)multiple producers single consumer problem.

9.) Find all possible interpretations of an array of digits. I proposed a solution I was asked to code it I coded it but he pointed out an error for test case containing zeros like 10,20,2010,so I handled the case of zero.

#### Round 5(45 min)

1.)I was asked to tell about my projects which was not the one I discussed in first round (either they had an discussion about it prior to my interview or coincidence).

2.)I had one project on web crawler so I was asked what changes will you make to this project to scale it.

3.)another project was an android game similar to duck shooting(video game) was asked to tell the difference between the 2.

4.)I was asked to tell how to copy last 10 lines from a file, he kept on asking for other methods (I answered around 10 different ways).

5.)add and subtract two numbers without using + or – operator.i was asked to code it.i used xor and binary and to solve it, then he asked to prove this method works.

7.)convert 777 to binary.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 218 (On-Campus)

Hii, Everyone this is my interview experience with amazon.

#### \*\*\*First Round (1:30 hr)-

It consist of two sections

:- Mcq (20 questions)

:- Two coding questions

1) Given two string Str1 and Str2, Find whether any anagram of Str2 is a sub-string of string Str1 (Case Insensitive) then return True otherwise False.

Test case :if Str1 = Amazon and Str2 = omaz, Output: True

2) Given n non-negative integers representing buildings where the width of each bar is 1, compute how much water it is able to trap after raining

For example,

Given [0,1,0,2,1,0,1,3,2,1,2,1], return 6.

I solved 19 mcq and both coding questions.

#### \*\*\*Second Round (F2F):(1:30hr)

1) Find LCA in BST.

2) Find LCA in Binary Tree.

3) Given a binary tree where each node contains three pointers left,right,succ, where succ pointer is pointing to any of its successor node , the question is if any of succ pointer is pointing to its predecessor node then make that pointer NULL.

4) Given an array that represents the runs scored by a batsman and we have given the total score ,now we have to find out in how many ways can batsman score the run.

Ex – arr = {2,3,1} total run = 4

2+1+1 = 4, 3+1 = 4, 2+2 = 4, 1+3 = 4, 2+1+1 = 4 and many more.

First I have given the recursive solution than interview asked me dp solution, I told him DP approach he was satisfied.

5) Find Loop in a linked list and remove it.

6) You have 100 songs to play in a shuffling mode how will you play.

Interview want full working code for each question for last question he wanted only approach.

#### \*\*\*Third Round (F2F):(1 hr)

1) Given a source string and a destination string and a dictionary consisting of various words write a program to find minimum length path to travel from source to destination. Rules for traversing:

1. You can only change one character at a time

2. Any resulting word has to be a valid word from dictionary

Example: Given source word CAT and destination word DOG , one of the valid sequence would be

CAT -> COT -> DOT -> DOG

Another valid sequence can be

CAT -> COT -> COG -> DOG

One character can change at one time and every resulting word has to be a valid word from dictionary

I told him a approach using graph.

2) What is hashing.

3) What is modular hashing.

4) How collisions can be handled.

5) Is semaphore guarantee deadlock prevention.

#### \*\*\* Fourth Round (F2F) : (2 hr)

1) A kind of celebrity problem you have n person where one of them is celebrity

condition are all non-celeb person knows celebrity and celebrity can know few other persons and all non- celeb persons can know few of them among each other so you have to find celebrity.

2) Given a binary tree and two nodes print the path between the two nodes of binary tree.

3) Find Height of Binary Tree represented by Parent array

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 217 (On-Campus)

Hi everyone ...Following is my experience for the recent recruitment drive of Amazon in our college.

#### \*\*\* First Round \*\*\*

:- Aptitude Round: (1:30 hours)

20 MCQs

MCQs on Outputs, Math, Algorithms, DBMS, OS.

:- 2 Coding questions: (onHackerRank)

1) Given two string Str1 and Str2, Find whether any anagram of Str2 is a sub-string of string Str1 (Case Insensitive) then return True otherwise False.

For Ex:if Str1 = Amazon and Str2 = zmao, Output: True

2) 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

For example,

Given [0,1,0,2,1,0,1,3,2,1,2,1], return 6.

#### \*\*\*\* Second Round (F2F) (60 min)\*\*\*\*

1) Check whether the given binary tree is BST or not

2) Find the lowest common ancestor of given two nodes pointer

3) Find Height of Binary Tree represented by Parent array

Input: parent [] = {1 5 5 2 2 -1 3} Output: 4

I did it in O(n2) and then interviewer ask to optimize it then I optimize the code but still it is O(n2) but the interviewer was satisfied with the solution.

4) Find the next greater element in array

5) Find orphan node and cycle in linked list. I gave him the logic and Interviewer was satisfied with approach.

TIP: Interviewer should understand your code properly. So write code neat & clean.

#### \*\*\*\*\* Third Round (F2F) (70 min approx.)\*\*\*\*\*

1) Again the interviewer ask the same question: Find the next greater element in array. I told him that I did it previous round then interviewer tell me that it is good u told me about this.

I think I got some loyalty point from this

2) Given the mathematical expression. Check for balanced parentheses in an expression with constraint of precedence like

[2\*(3+4)] = True;

{2\*[2+4]} = False;

I give him approach and written full code for this.

3) How to detect cycle in graph ( I just told my approach using DFS)

#### \*\*\*\*\* Fourth Round (F2F) (120 minute)\*\*\*\*\*

1) Consider a row of n coins of values v<sub>1</sub> . . . v<sub>n</sub>, where n is even. We play a game against an opponent by alternating turns. In each turn, a player selects either the first or last coin from the row, removes it from the row permanently, and receives the value of the coin.

Determine that the user move first or second so that he will get the maximum possible amount of money

I gave him the recursive approach for this then he ask for optimize code for this then I make DP for this.

2) Consider a 2-D map with a horizontal river passing through its center. There are n cities on the southern bank with x-coordinates a(1) . . . a(n) and n cities on the northern bank with x-coordinates b(1) . . . b(n). You want to connect as many north-south pairs of cities as possible with bridges such that no two bridges cross. When connecting cities, you can only connect city i on the northern bank to city i on the southern bank.

I have no idea about this question I think 10 minute and told the interviewer that I'm unable to solve this. But the interviewer asked for my approach then I gave him brute force solution for this and Interviewer asked for the code. Then he told me to optimize the code then I gave recursive approach for but still complexity is exponential and Interview asked me optimize this and again I think for half an hour & arrive at solution that in DP with extra space. But he still wants better solution and gave me five minute more. Then in the five minute one best solution strike in my mind and told to interviewer and he is happy with effort then he ask to code.

TIP: What I learned from this round is that Push yourself to the edge. Give something different or better than geeks

#### \*\*\*\*\* Fifth Round \*\*\*\*\*

1) Some project discussion in brief and some question on project like what is your role, what difficulties you faced, and future scope.

2) Find minimum height of tree (I gave him two approach using 1) simple 2) using level order)

3) Some simple Bit-masking problem

4) Given an input file with four billion non-negative integer. Provide an algorithm to generate an integer which is not contained in the file. Assume you have 1 GB of memory available for this task.

Firstly I have no idea then interview is giving me hint and I give my approach using bit vector by mapping all integer from this bit-vector.

#### \*\*\*\*\* Sixth Round \*\*\*\*\*

1) He give me an API function that increment the counter when the client access this. And told that two client simultaneously accessing this API function. Then they get ambiguous value of counter. Why this is happening?

I give him Peterson solution and semaphore solution for the critical section problem.

2) Some more question on OS (thread, Mutexlock, and deadlock)

3) One more DP Ques: Remove minimum elements from either side such that 2\*min becomes more than max.

I gave him geeks solution but he ask that Have u seen this problem before? I said yes then he ask to code the recursive approach for this I write it Correctly. And He was satisfied.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 216 (On-Campus for Internship)

Amazon came to our campus a week back and this was the procedure followed.

### Round 1 : On line coding (1 hr 30 min)

This round has 20 aptitude+coding +OS mcq questions

2 coding questions

1-Given a linked list retain the first i elements and delete the next j elements.

2-Given an array of number give a permutation of array which when converted to a number is the greatest. eg Input-{2,985,9,3} output {9,985,3,2} as 998523 is the greatest number that can be made.

12 students were selected for the next round.

### Round 2 (Face to Face) (1 hour)

Introduce about yourself, asked my interests and then jumped to questions

First asked me dbms questions . ACID properties, transactions.

Then OOP questions , to explain the concepts of OOP.

Technical question-

Given an array which has id of songs write a song shuffle song. I first gave an hash table approach he asked me to optimize it which I reached eventually.

Given a binary tree , connect all the nodes at the same level with a next pointer.

Given a sorted,pivoted array search for an element

At the end 4 students were selected.

All thanks to geeksforgeeks for helping me with my preparation.

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## GATE CS Corner Company Wise Coding Practice

Internship

## Amazon Interview Experience | 215 (On-Campus for Internship)

### Online Round(1:30 hrs)

20 MCQs based on OS, C, C++, 3 questions on aptitude & 1 question on DBMS.

Q1. Write a program to separate even nodes from odd nodes and odd nodes must come after even nodes(in place).

**Input:** 17->15->8->9->2->4->6

**Output:** 8->2->4->6->17->15->9

Q2. Find if the Robot moves in Circular fashion.

<http://www.geeksforgeeks.org/check-if-a-given-sequence-of-moves-for-a-robot-is-circular-or-not/>

After this round 20 students were shortlisted.

Then there were 2 PI rounds

### Round 1:

Q1. Print a matrix spirally.

Q2. How to deserialize and serialize a binary tree.

After this round 8 students were selected.

### Round 2:

Q1. Given a sorted stream of 0's and 1's, find the first occurrence of 1. Write a full working code.

I firstly did it in O(n). Then he asked me to reduce the complexity. I reduced the complexity to O(log n) by applying binary search.

Then he asked about my project mentioned in my CV. It went on for 20 minutes.

Then he asked me another question.

Q2. What happens when you click a web address and how are web pages retrieved.

Q3. He asked me about memory management in C and C++ and how new allocates memory to objects and he asked me to overload new operator.

Q4. If you are given some functions and whenever you call that function, the timestamp is stored along with function name.

eg:  
f1 1:20  
f2 2:30  
f1 3:10

Suggest an appropriate data structure and write a code to make following queries within two given time stamps t1 & t2:

query 1: Return number of all the functions called between t1 & t2.

query 2: Return number of times a particular function is called between t1&t2.

Then he asked me various OS and networking Questions.

Q5. Given an array of integers, find a subarray having least average.

Q6. Suggest some data structures to maintain relationship between various hierarchies in an organization.

Thanks to geeksforgeeks for helping me out.

Read [Geeksquiz](#) for MCQs & g4g for interview questions.

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## GATE CS Corner Company Wise Coding Practice

## Amazon Interview Experience | 214 (On-Campus)

Amazon visited our campus for recruitment. Here is my experience.

First there was an online round on hackerrank and consisted of 20 mcqs and two coding questions. Here are those two questions:

Ques 1: Given a singly linked list, write a function to put all the even numbers at the front and odd numbers at the end of ll while maintaining the order of numbers. In place solution was expected.

Ques 2: Given a sequence of moves for a robot, check if the sequence is circular or not. A sequence of moves is circular if first and last positions of robot are same. A move can be either R(Rotate right), L(Rotate left), G(Go one unit).

Round 1: There was some discussion on my internship project. Then i was asked the following coding questions:

Ques 1: Given an array, find a pair of elements which gives us the maximum sum.

Ques 2: Given an array of strings in sorted order, print all the same strings only once on the screen.

Ques 3: Given a binary search tree, find the kth smallest element int it.

Round 2:

Ques 1: Given an array, find the maximum length of subarray such that the average of that subarray is the maximum of all subarrays.

Ques 2: Given the data value field of a node, print all the nodes at distance k from that node in a binary tree.

Round 3:

Ques 1: Write a function which takes input as bank balance and returns a string equivalent of that integer/float.

Ques 2: What happens after we type some web address in a browser and hit enter.

Round 4:

Ques 1: Given an integer and a mapping of Roman numerals [I:1, V:5, X:10,L:50] write a function to convert any integer between 0 to 100 to Roman numerals. All the rules for conversion have to be followed.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 213 (Off-Campus for SDE1)

Hello I have applied for Amazon after completing my 1 yr at job and got a call for a full day interview.

Interview happens as in following rounds :

#### Round 1(Technical):

1.)I was straight away asked to write code for detecting loop in a linkedlist without any formal introduction and all <http://www.geeksforgeeks.org/write-a-c-function-to-detect-loop-in-a-linked-list/> .

After telling my approach he asked me to give a proof of it to which I got shattered but then he gave me a hint and later discussing it we got to the proof but it wasn't a full-valid proof. But later on it I found <http://math.stackexchange.com/questions/412876/proof-of-the-2-pointer-method-for-finding-a-linked-list-loop>

After it he asked me to detect starting point of the loop. Again which is geeksforgeeks. I wrote the full code on a paper and understand him my approach which is very similar to geeksforgeeks one. <http://www.geeksforgeeks.org/detect-and-remove-loop-in-a-linked-list/>

2.)He gave me another question from g4g which I haven't read before

Sort one matrix based on another matrix. I gave him one brute force approach, then he asked me to optimise it and then we discussed a bit and finally I came up with O(nlogn) approach. However this is <http://www.geeksforgeeks.org/sort-array-according-order-defined-another-array/>

I was a bit hesitant after 1st round as I've mumbled upon the proof of detecting loop in linkedlist until he gave me some hint. However, I was called after 2-3 long hours of waiting for my 2nd round of interview.

#### Round 2(Technical):

He was a very senior guy and a very cool and calm personality. He entered the room and said sorry to me for such a long wait and then started with formal introduction as to What you do in your present company and why do you want to leave it at such an early stage.

1.)He asked me to check whether a given tree hold children sum property or not. Another g4g question <http://www.geeksforgeeks.org/check-for-children-sum-property-in-a-binary-tree/>.

As soon as I heard the problem, I told him my approach and coded it on a paper. He then to clarify if I haven't crammed it asked me to explain him the recursion and dry run it on different examples. I did that explaining him completely the edge cases and every aspect of that recursion. He was impressed

Then he started telling about his experience of startups and that of Amazon

2.) He asked me another question :

Given a stock market price for each day in an array. Give the ans as to when you will buy stocks and when you will sell so as to make the maximum profit.

I think for a while and gave him my approach which he was quite impressed.

After that HR asked me to leave and said that you'll be informed about the result and further rounds.I got a call and was asked to come for Hiring manager Round

#### Round 3 (Hiring Manager):

He is the manager of the team for whose team interviews are going. So he started off with the formal discussion as to what are my technical interests and what did I learn in my previous jobs. Then he starts discussing my CV and asked me to pick any 2 projects at which I'm confident enough.

As I wrote technical paper on the work I did in my last job, so he started discussing over that and asked me different ways of solving that problem and how could I optimize it further. Then he asked me some of the behavioral questions as of why are you leaving when such a good work is there. I told him the concern about salary. It went fine and I thought that I impressed him.

Later on HR told me to wait for another 4 hrs for Sr Manager round.

#### Round 4 (Sr Manager):

He is a very senior person in the Amazon. probably their head of some main division. He started off with very behavioural questions as to why leaving so early and why Amazon. It was very hard to convince him as his expressions were not changing at that time. He fired me a series of such questions as to what is the most difficult task I have performed till yet technically. He was hoping for answers specific to work related. What are your weakness and strengths and what are you doing to improve yourself.

Then he jumped to my CV and asked me for each and every single detail written in my CV (so please make your CV as small and as specific to your strong points as you can). He asked my role in different projects I have done and in the technical paper I have written along with others. he even asked my college projects(even the 2nd sem project which I forgot to take off from my CV) to the depth and asked for the specific details( He knew about everything regarding my projects ).

Then after this discussion I thought it would get over, but he has some other plans. He asked me to give a solution to some coding problems:

1. Check how many Parenthesis are balanced in an array of parenthesis. This was easy but then he asked me to scale it such that your array can't reside in one memory. To this I said do parallel processing, he gave me freedom of number of clusters on which I can store and compute and then it took some time to me to come up with scaled algorithm. That was quite interesting and energetic enough. All my tiredness went off.

2. In a string detect the smallest window length with highest number of distinct characters. For eg.

A = "aabcbcdcba", then ans would be 4 as of "dbca"

Finally I gave him some solution which was incomplete, he asked me to relook at my solution and I found the mistake but didn't ask me to code it.

I would like to thank G4G to be such organized forum with the help of which, we can get what are the current trends in interviews and also what they expect.

Don't copy the solution from g4g but get the approach as that will help you to solve newer problems ;). In other words train your model rightly, Don't overfit it, else your accuracy will be compromised ☺

Thanks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 212 (On-Campus)

#### Online Coding Round

Time 1 hour 30 minutes.

1) Given an array of numbers, Rearrange the numbers to make the even and odd numbers alternate. If any one type is in excess, let it come in the end.

2) Given a binary tree, change the value of the node by the sum of the values of its children.

I completed both the programs, first one passed 7 test cases, second one passed all test cases. I was shortlisted for the interviews

#### 1st Round F2F (Technical)

Asked what was my favorite project among the ones I have mentioned in my resume. Then he asked to explain Project, and then he asked few questions regarding it.

He asked 2 questions. One was regarding linked lists. I forgot what those questions were.

#### 2nd Round F2F (Technical)

Stack using 2 queues. I implemented and showed, he was happy.

Given a matrix. Each cell is either marked with a \* or nothing. One cannot go into the cells that are marked by a \*. Given 2 points a and b in the matrix, Find out if point b is reachable from point a.

I gave a solution, but I had missed marking the cells visited. He pointed out that it will be an infinite recursion. So I said I will mark it visited. He then told me to code it. I did. He was satisfied with it.

Robot problem. Dynamic programming. I somehow solved it, he then asked for the code. I wrote it. He tried to understand himself, but he wasn't able to. So I made him understand, he was happy and satisfied with it.

#### 3rd Round F2F (Technical)

Questions on OOPs concept. Asked what a singleton class is. I answered, then he asked how can it be implemented in C++. I was weak in the C++ language, so he gave hints. I tried but he was not satisfied with my answer.

Then he asked a question regarding trees. Given a binary tree, you have to connect all the nodes in each level through extra pointers.

I gave an approach using queue. He then asked how to do with constant space. I tried, but I had forgotten the algorithm. He tried giving hints, but I wasn't able to solve.

#### 4th Round F2F (HR + Technical)

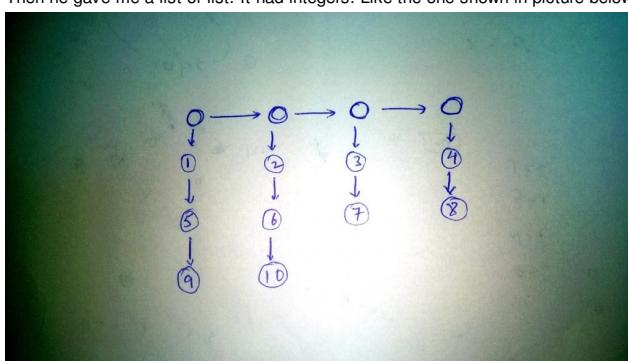
He started off by asking how was the other interviews. Then he asked the typical "Tell me about yourself".

He asked me little about my favorite project. I selected the same one which I explained in the first interview.

Next he asked, Given just a page of a Dictionary. It can be from anywhere, middle, end or start. The dictionary is for a language that one doesn't know. You have to find out the order of the alphabets, which one comes before and which one comes after. I started with an approach using generic tree. He asked me why can't graph be used. I thought a little and agreed, and started using graph. I explained him the inconsistencies that can occur. Later after few minutes of discussion, he told me, suppose he gives me a graph with letters in place of nodes, and says to find out the order of the alphabets. How would I go about doing it. I mentioned topological sort, but I said I don't remember the algorithm properly. He gave a little hint, that reminded me, and I solved it.

He gave a scenario. Suppose you type "www.amazon.com" and hit Enter. What goes on in the background after that. I gave a detailed explanation with Network layers, routing, CDN, Content Caching. I missed out NAT, so he asked me what it was and how it will be used.

Then he gave me a list of lists. It had integers. Like the one shown in picture below (in Attachment).



He told me to print 1, 2, 3, 4... I did it using loops, But he wanted to optimize it, and said that I can modify the list if I wished. So I thought a little and got the idea. He

asked me to write the code. I wrote, he saw and said there was a bug, but he had missed something, i explained him, so he was satisfied with the code.

Only 7 people were there till the last round. The interviews were over by 10:40pm. They took 3 hours to come to the final list. They said that we all did very well. At 1:30 night they announced 3 names. I was not selected. All in all it was a good experience, but i was a little sad after the results came out.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# Amazon Interview Experience | Set 211 (On-Campus for Internship)

### Round 1 (Coding + Aptitude):

First round comprised of problems on OS, DS, Basic Aptitude, Algorithms, Time Complexity etc. followed by 2 coding questions on HackerRank platform

1. Find the nth Magic Number where a Magic Number is either a power of 5 or the sum of unique powers of 5. Eg. 5,25,30(25+5),125,130(125+5),...
2. Given a dictionary find if any possible division of the input string corresponds to strings present in the dictionary. Eg. If "i" and "like" are present in the dictionary, we need to find if the given input string(say "ilike") can be divided such that its components are members of the dictionary.

18 students were shortlisted after this round.

### Round 2(F2F)

Problem 1 Given a matrix containing 1's and 0's in sorted order(all 1's should be continuous followed by all 0's), we need to find the row which has the maximum number of 1's.

Eg. Consider the matrix

```
1111000
1000000
1110000
1100000
```

Your program should return row=1(1 based indexing)

Expected complexity =  $O(r+c)$  where r is the number of rows and c is the number of columns.

I started out with  $O(r*c)$ , then optimized to  $O(r\log c)$  and finally  $O(r+c)$ .

Problem 2

Given three points in space find if a triangle exists.

Problem 3

Given four points in space find if a square exists.

Problem 4 Given points in space, how will you determine whether the points given are in clockwise order.

All the problems required full working code for the most optimized approach.

10 students were further shortlisted for the next round.

### Round 3(F2F)

We initially discussed about my project including the future course that I would like to further steer my project in.

Problem 1 Given a Binary Tree, find if it is a Binary Search Tree with constant space complexity.

Problem 2

Suppose there are n Petrol Stations in a circle. The difference in distance between two stations P1 and P2 is L1 and so on and so forth.

Now, given the fact that for every unit of petrol consumed you can only walk 1 unit distance and you can move further only for positive difference between the reserve petrol and the distance that is to be traversed. . Find out if there is a vertex starting from which you can come back to the same point traversing the circle once.

Expected Complexity  $O(n)$  I started with  $O(n^2)$  and gradually optimized it to  $O(n)$

(Hint: Build a reserve array such that  $R[i] = P[i] - L[i]$ )

Full working code was required in this case as well.

After this round, 6 students were selected for internship.

### TIPS:

1. Stay calm
2. Remain super confident throughout. That is the key.
3. Have faith in yourself
4. Your implementation skills must be real good.

All thanks to Geeksforgeeks for helping me with my preparation and for being an excellent repository of past Interview Sets.

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## GATE CS Corner Company Wise Coding Practice

# Amazon Interview Experience | Set 210 (On-Campus)

I am sharing here my experience in Amazon On Campus Interview. Amazon visited our campus for SDE-1 positions.

## Round 1(Coding + Aptitude)

There were 20 MCQs based on aptitude and technical questions. The quality of questions were good.

Two Coding questions were as follows:

1. Convert a given Tree to sum tree (from geeksforgeeks)
2. Given an unsorted array of positive and negative numbers, create an array of alternate positive and negative numbers without changing the relative order of positive and negative numbers respectively. Suppose the array is(zero is treated as positive)

array : 9 4 -2 -1 5 0 -5 -3 2

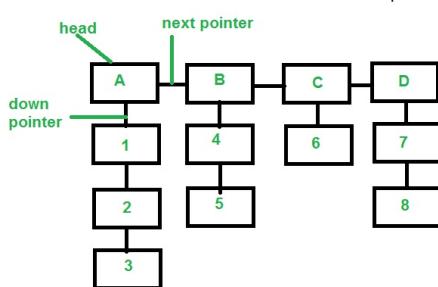
result: 9 -2 4 -1 5 -5 0 -3 2

24 candidates were shortlisted for the Interview round out of around 300 candidates.

## Round 2 (F2F)

Asked questions like, Tell me about yourself, most challenging project, most risk taking step in any project, any project in which you did something extra for your team even though it was not in requirement.

1. Given a multilevel linked list with next and down pointer as shown in the image below:



Give the following output without using any extra space: 1->4->6->7->2->5->8->3

Solution: Make the next pointer of D to point to down pointer of A, followed by making next pointer of 1 to point to down pointer of B. Similarly proceed until the two heads meet.

2. Connect nodes at same level using constant extra space (expected me to write a modular , clean and production level code)

## Round 3(F2F)

1. Given a string and a pattern, Replace all the continuous occurrence of pattern with a single X in the string. With example it will be more clear

String: abababcdefababcdab

Pattern: ab

Result: XcdefXcdX

Initial 3 occurrence of ab is replaced by one X and then two occurrence of pattern is replaced by one X and final one occurrence of pattern is replaced by one X

Coded it incorrectly in first attempt. The interviewer gave me another chance, coded it perfectly.

2. Print the left and right side view of the tree in a same function. (wrote a clean code with no mistakes)

## Round 4(F2F)

Asked about my projects, about myself etc etc

1. Given a stream of Twitter data with hashtags generated in time construct a data structure to give top K trending tweets at a time.

I initially suggested max heap based on frequency but was unable to find top K nodes in a max heap.(\*Trouble)

Later, i suggested to maintain a hash table with frequency count as the value and hashtag as key and to implement a k-size Min-Heap to store the top K elements.(She was satisfied but not happy with the time complexity)

2.(\*Trouble) Because of my statement to find top k elements in a max-heap, i was asked to code for finding Top K elements in a max heap with size N where (N>K). It seems to be trivial but it isn't. I tried my best and didnt give up, the interviewer was happy with my energy and my never-give up attitude :P.

## Round 5(F2F)

Asked me about a project done as a team and what was my role in it. My most challenging project etc

1. Suppose a chemical Formula is given C<sub>6</sub>H<sub>2</sub>(Cl<sub>3</sub>(OH<sub>2</sub>)<sub>3</sub>)<sub>3</sub>

Print: C-6 H-20 O-9 Cl-9 (Print the number of atoms of each element in a compound)

Solution: Gave a stack based approach where we need to push opening brackets and atoms and multiply the frequency of each atom in stack with the value after closing bracket until we find a opening bracket.

2. OOPs concept: Abstract class, Interface, Singleton class, code for constructor of singleton class.

Tips: Always practice on paper. Never give up in interviews. Pick up hints from interviewer. Be Energetic. Study from geeksforgeeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 209 (On-Campus)

#### Round 1:-

MCQ – Memory management , angle between hands of clock at a certain time , Inheritance etc

Coding :- There were 2 coding questions

1) Given 2 Strings , check if any anagram of one string is a substring of the other string

2) Given some friends on Facebook say A, B, C, D. and their friendship as AB and BC

We need to find out the minimum Hops from a query say:- for A to C the hops should be 2 A to B and B to C , (Floyd Warshall Algorithm)

I solved approximately 17 correct MCQ's out of 20 and Both the Coding questions.

#### Round 2:-

This round was the longest . (1 hour 40 min) approx

first slight discussion on a project . I was discouraged to explain in detail and asked to give high level discussion .

3 questions :-

1) if we throw light from the left of a tree , what nodes receive light .

2) extended first question and asked boundary traversal of a tree

3) asked to search an element in a sorted and rotated array

#### Round 3 :-

(45 min)

2 questions :-

1) Given an array of positive and negative integers we need to find the longest subarray where sum =0

first gave  $O(n^3)$  then  $O(n^2)$  then finally  $O(n)$  time+ $O(n)$  space

2) given an array of size n-1 and given that there are numbers from 1-n with one missing ,

the missing number was to be found

#### Round 4:-

(1 hour 15 min)

4 questions :-

1) given a number line from -infinity to +infinity what are the minimum number of hops required to reach a number given the condition at step j I can take j steps forward and j steps backward

2) what datastructure to use to implement best fit algorithm , I gave a skip lists solution which i thought was a strong solution

3) Traverse a binary tree in zig zag order – very common question

4) given some values [M] [T] [R/W]

M- memory address

T- time slice

R/W- Read/ write

the number of conflicts were needed to be found out !

I couldn't make it after this round –

Why I got into such a predicament was because I was too excited and was asking too many questions and trying to discuss CS concepts which were unrelated to the problem in hand .

#### Only 2 tips :-

1) Geeks for Geeks is a MUST, so is GeeksQuiz

2) Speak as little as possible the interviewers would not be interested in answering your questions with the time constraint that they have , Short discussions are acceptable but I was trying to ask too many questions and telling them about stuff I knew without them asking .

Thank you Geeks for Geeks for making answering amazon questions easy !!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 208 (On-Campus for Internship)

Amazon visited our campus for hiring Software Developer interns for Summer 2016.

Cut-Off : 75%

140 students were shortlisted.

#### **Round 1 (Coding + Aptitude):**

First round mostly comprised of problems on OS, DS, Basic Aptitude, Algorithms etc.

2 coding questions

1. Given a string find the first non repeating character in it

2. Given an array of integers, find count of minimum number of elements to be removed from the array such that the maximum element of the new array is at most twice of the minimum.

39 shortlisted after this round

#### **Round 2(F2F)**

He asked about my favorite subjects and Data Structures that I have implemented. I named few Data Structures including Segment Tree. Then he asked me about segment trees and how to solve some simple problems based on segment trees, He asked only about approach didn't ask me to code. Then he asked me about

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

I told him approach using level order traversal. Then he asked me to connect nodes on same level but this time to their left sibling. After telling my approach he asked me to code and said that he want code free of any errors. After I gave him my code he pointed out that there are some errors in code. He asked me to find and correct them myself.

Then he asked another question:

<http://www.geeksforgeeks.org/diameter-of-a-binary-tree/>

After hearing my approach for this question he asked me to print leaves that correspond to diameter.

#### **Round 3(F2F)**

Only one question was asked in this round. She asked me to implement a data structure that can perform

1) Insert ( $O(1)$ )

2) Delete ( $O(1)$ )

3) Count( $O(1)$ )

4) Get Element( $O(1)$ )

on integer inputs. Here Get Element returns any element present in DS.

I told her my approaches using array, single linked list with hashing and using two singly linked list and hashing. I couldn't reach exact solution but she was satisfied with my approach.

Solution to this problem was easy using doubly linked list and hashing.

After this round a total of 19 students were selected for internship.

#### **TIPS:**

- Think before you speak
- Be honest during interview
- Stay Calm
- Take hints from interviewers

Finally, I would like to thank GeeksforGeeks for helping me with my preparation ?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 207 (On-Campus for Internship)**

Cut off: 75%. Around 140 students were short listed.

#### **Round 1: 90 minutes**

It comprised of 20 MCQs on aptitude, operating system, DBMS, data structures and algorithms on Hackerrank.

There were two coding questions

1. Given a string find the first non repeating character in it,  $O(n)$  was good enough.

2. Given an array of integers, find count of minimum number of elements to be removed from the array such that the maximum element of the new array is at most twice of the minimum.  $O(n\log n)$  solution was required.

39 shortlisted after this round

#### **Round 2 (F2F) 75 minutes**

The only question that was asked was

Find the third largest element in the array

I first gave him a heap solution( $k$ th largest element in the array )

He asked me to write the code for it.

Then he asked me to improve it. And then i gave him  $O(n)$  solution .

He said that i should cover all the edge cases .And left the room alone for 30 minutes. Then he came back and he was satisfied with my solution .And immediately said that wait for the 3rd round

### Round 3 (F2F) 75 minutes

Here the main focus was on Data Structures

1. Mirror A Binary Tree.

2. Given Two BinaryTrees , check if they are mirror of each other. (Told me to code it)

3. Level Order Traversal in spiral form(Told me to code it)

4. Boundary Traversal in BinaryTree

5. Merge k sorted arrays.(All approaches).

6. Diameter of the BinaryTree

Then he asked some question on OOPS(friend function etc.)

Lastly, he asked if I had anything to ask him. I asked about the role of data structures and algorithms in the company work . He said they are used greatly that's why we judge all of you on the basis of these only.

#### Tips:

Be expressive during your interview.

Strong Data Structures And Algorithms

Focus On More Than One Solution Of The Question

Stay calm and confident.

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## GATE CS Corner Company Wise Coding Practice

[Internship](#)  
[Interview Experiences](#)  
[Amazon](#)

## Amazon Interview Experience | Set 206 (On-Campus for SDE-1)

Hi Everyone recently Amazon visited our campus for SDE-1 and internship and I got an offer for internship as well as SDE-1. Here's my experience.

#### Written Exam(1hr:30mints):

There were 22 questions asked in which 20 were of MCQ's and 2 coding questions. Most of the MCQ's came from OS, Algorithm, C-o/p and aptitude (directly from previous year Computer science GATE).

First coding question: Determine the diameter of a tree (Taking input was a bit difficult as we have to take input in array of unknown size,sort it and create BST).

Second coding question: Given a string of words separated by comma,we have to print pair of words who are anagrams line by line(case-insensitive). If you don't find any such pair then print -1.

#### Interview Rounds:

##### Round 1(1hr:15mints):

1. Started with Introduction then he jumped into project and discussed about 15 mints.

2. Given an array print elements according to frequency and if two elements have same frequency then print it in decreasing order.

Gave solution using 2d matrix in  $O(n^2)$ . Then reduced the complexity by using AVL tree in  $O(n\log n)$ .Later coded AVL tree solution on paper.

3. Given a binary tree, print boundary traversal

I gave solution by using three traversal(as given in gfg) then he asked me to do it in single traversal. I discussed a lot with him then finally came up with solution by using queue and stack data structure. Later he asked me to code it and I coded correctly. He was impressed with my code.

##### Round 2(1hr):

1. Started with project discussion of around 25 minutes.

2. Given an array of stock prices, find maximum loss in buying and selling stocks. I gave him approach first, then he asked me to code. Coded it.

3. Implement garbage collector in C without using free function.

4. What is virtual inheritance.

5. Explain how the file is stored in memory.

6. Explain UNIX I node Implementation.

7. Difference between process and threads.

8. How threads are executing parallelly and how they share memory.

9. Asked algorithm to schedule kernel level threads(gang scheduling).

##### Round 3(1hr:30mints):

1. Started with Introduction

2. Detailed project discussion of around 45 minutes.

3. Given me the Resource allocation graph with set of processes and resources, ask me to tell him the approach to execute all the processes.

I told him to use topological sort suddenly he said very good and ask me to code. I coded it.

4. Explain the need of synchronization with the help of example.

I explained him with use of producer-consumer and printer spooler problem(also written code for both).

5. basics of synchronization i.e code for wait and signal operation and how the semaphore maintains their suspended list.

At the end of this round interviewer was very impressed.

#### Round 4(1hr):

1. Given a integer number n, tell its binary representation is palindrome or not.

e.g 4=100 not palindrome

5=101 palindrome.

TC = O(n) and SC = O(1) was expected and I coded it.

2. He gave me a java code using lock on this keyword. Ask me is there any problem in the code using lock keyword when multiple threads are running concurrently. I found the problem then he ask me to resolve it and I resolved it.

3. What is virtual memory. Who implements it.

4. How virtual memory concept is implemented in system.

#### Tips:

1. Interviewer don't expect you to give all correct answer though they want to see your approach first and how you tackle a problem which you don't know apriori.

2. Brush up OS fundamentals thoroughly and try to practice code on paper as much as you can.

3. Along with basic data structures also have some idea of advance data structures like BBST,Trie,Graphs etc.

4. Think loud in front of interviewer and try to engage him all the time.

5. Listen his words carefully, probably they will have some hints to answer.

I would like to thanks geeksforgeeks team for providing such a great platform. You guys are doing awesome job.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 205 (On-Campus for Internship)

Cut off: 75%. Around 140 students were short listed.

#### Round 1: 90 minutes

It comprised of 20 MCQs on aptitude, operating system, DBMS, data structures and algorithms on Hackerrank.

There were two coding questions

1. Given a string find the first non repeating character in it, O(n) was good enough.

2. Given an array of integers, find count of minimum number of elements to be removed from the array such that the maximum element of the new array is at most twice of the minimum. O(nlogn) solution was required.

39 shortlisted after this round

#### Round 2 (F2F) 75 minutes

1. Given a complete BST, find kth minimum element. Required time complexity O(logn) and O(1) space complexity. The interviewer was really supporting and kept giving me hints to reach the solution.

2. Given a 2D array of 0s and 1s. Find largest square submatrix with all 1s. Although I made silly mistakes initially, I arrived at efficient solution later.

3. Find the LCA of two nodes in a binary tree.

Around 22 shortlisted after this round

#### Round 3 (Tech +HR) 45 minutes

It started with questions like

1. why do you want to join Amazon?

2. what are your areas of interest?

3. plans for higher studies?

He scanned my resume and then proceeded with a brief description of my project and its relevance.

2 coding questions

1. Maximum sum subarray

2. Maximum product subarray

covering all corner cases and proper working code

It moved on to detailed discussion on OS: thrashing, threads, processes, mutex semaphores etc. The interviewer was nice and made me comfortable throughout the process.

Lastly, he asked if I had anything to ask him. I asked about the role of interns and latest projects going on in the company.

#### Tips:

Be expressive during your interview.

Have a good resume (Aggregate+Projects+Coding skills)

Stay calm and confident

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 204 (On-Campus for Internship)

Cut off: 75%. Around 140 students were short listed.

#### Round 1 (Written Test) 90 minutes

It comprised of aptitude, operating system, complexity, hashing ,graph, and complexity related questions (20 questions).

There were two coding questions

1. Given a string find the first non repeating character in it
2. Given an array of integers delete minimum number of elements such that the minimum of the arrays is at least twice of the maximum. (need to return the count).

#### Round 2

The round began with my brief introduction and then there was a question on arrays.

I was given an array with all elements greater than or equal to zero

I was asked to return the maximum product of two numbers possible

It was quite easy as we can find the maximum and the second maximum and their product will be the answer but the interviewer wants me to reduce the number of comparisons. Initially I did it in  $O(n)$  and with  $2^n$  comparisons

and finally came to a solution with  $3n/2$  comparisons by considering the numbers in pairs. The interviewer was satisfied with my solution and I was asked to write a production level code for the same.

example Test case

5 9 3 7

answer  $9 * 7$

Now she added one more constraint to it we are not allowed to change the structure of array and we need to find the pair such that they are in increasing order

example

1 9 7 8

answer  $7 * 8$

Initially I did it in  $O(n^2)$  ie for each element i I found the maximum to its right and then compare the maximum with the ith element then it can be the possible pair and can contribute to the result

I came up with an ( $n \log n$ ) solution using segment tree and sparse table

(Range maximum query) (Interviewer was impressed).

Finally I created a max stack from the right side and did it in  $O(n)$  with  $O(n)$  space but still she wanted me to reduce the space to  $O(1)$

It was already 1 hr and she gave me a hint that move from right side

and bingo I was able to answer her in just 5 minutes.

She was completely satisfied with my solution.

Then there was a small discussion on my projects.

#### Round 2

The round again began with my brief introduction and then he asked me about my favorite subject.

He asked me to explain any data structure. I explained him Tries and segment trees. I even told him about how tries can be used. I told him about auto complete features available, forward dns and their working (He was impressed)

Now he was asking questions from application point of view

He asked me about heaps and its uses and to comment upon it

I explained him heaps priority queues and complexity of its operations and about Fibonacci heaps.

Application for merging k sorted arrays.

He asked me to illustrate some applications of circular linked list and double linked list.

I told him double linked list can be used for LRU cache and using hashmap it can be done in  $O(1)$  expected complexity per operation.

I was asked to code it.

For circular linked list I told him that it can be used for implementing a circular queue efficiently since we need to maintain only one pointer ie. the rear for it.

Application BFS.

He then asked me to code and dry run a circular buffer and optimize it and compare it with standard cyclic queue.

I used a counter variable for this purpose to use the buffer completely

and told him that the drawbacks can be when multiple processes try to access this shared variable then there may be inconsistency hence traditional one was better.

Then he asked for critical section, locks, semaphore and mutex.

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# Amazon Interview Experience | Set 203 (On-Campus for SDE-1)

Hi everyone. Following is my experience of the recent Amazon recruit drive:

### Aptitude Round: (1:30 hours)

20 MCQs

MCQs on outputs, maths, algorithms, DBMS, OS.

2 Coding questions: ( on hackerRank)

- Given 2 strings, check if any one of them has any anagram of the other string, as a substring of it.
- Graph question : ( not mentioned directly as graph, but was implied). basically Needed to find the shortest path between two given vertices in the graph.

Tip: It is important that one should attempt both sections decently.

### Interviews:

#### Round 1:

- On a number line from negative infinite to positive infinite, if you start from 0, you can either jump back or front. but every jump length is 1 more than the previous jump. Given a number on the number line, can we reach it using any combination of jumps. If yes, print the minimum length path.
- <http://www.geeksforgeeks.org/a-boolean-matrix-question/>
- <http://www.geeksforgeeks.org/find-the-row-with-maximum-number-1s/>

#### Round 2:

- You have n slabs with two dimensions. Stack them to get max height. No rotation of dimensions required. First he started with 2 dimensions, then 3, 4 and then for n dimensions.
- Given a binary tree, a target node in the binary tree, and an integer value k, delete all the nodes that are at distance k from the given target node. No parent pointers are available.

#### Round 3:

- <http://www.geeksforgeeks.org/sort-array-according-order-defined-another-array/>
- An array of 0s and 1s is given. A sequence is given as  $f(1)=1, f(2)=2, f(n)=f(n-1)^2 - f(n-2)^2$ .  
Print 0s and 1s alternatively according to the given sequence.

#### Round 4:

- Implement the power function in log n complexity.
- Intersection of two arrays
- Given a stream of As and Bs, print 1 when no of As is odd and no of Bs is even. I just had to draw the DFA for it.
- An SQL query.

#### Round 5:

- Given an array and a window k, print the minimum in every window of k. After suggesting a few data structures like dequeue, heap, bst, he told me to code it using bst.
- A file system is given. All the subdirectories in the root directory, the subdirectories within subdirectories and so on is given. The input is some file or subdirectory paths for which we need permission. Find the minimum permissions required to get all the permissions. No file for which permission is not asked should be given permission to.

### Tip:

- The interviewers are really very helpful and they keep on giving hints if you are stuck. Just let them continuously know your thought process. It is not necessary that you speak continuously but let them know what you think in intervals.
- They might ask you to think of better complexities and different data structures to solve the same problem. But its not that if you straight away land up in an optimized solution its bad for you because I was asked sometimes to compromise on the complexity but think of other data structures to solve it.
- While coding take your time. Make sure you cover the corner cases and if it is taking long, let your interviewer know what you are doing currently. Test it before finally approving it. If it fails, don't worry, tell your interviewer about it and think of a fix or an alternative.

**Finally, a big big thanks to GeeksForGeeks for being a wonderful resource.**

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I had an interview with Amazon recently below are the questions asked.

#### Qualification round

1) Rotate/Shift the elements of a square array clockwise by one at a time. (Not by 90 degrees, but by one element. Think of concentric circles)

Example:

1 2  
3 4

Output:

3 1  
4 2

2) Write a function that determines whether a two dimensional array contains duplicate values within k indices of each other

The first line of input will be a number indicating how many rows are in the matrix. This will be followed by lines of input one for each row of the matrix each row will contain the same number of columns with each column separated by a space. Following the matrix will be a single line of input containing a number indicating the k value.

Output should be 'YES' or 'NO'

example:

4  
1 2 3 4  
5 6 7 8  
9 10 11 12  
13 14 15 16  
3

Output: No

#### F2F Interview

5 rounds in total.

Each round was for 45 mins.

1st F2F

Tell me about yourself

Given three sorted arrays, how will you sort all the three arrays into one array, shortest time expected

2nd F2F

Design architecture that should handle millions of hits at given time, the response time of the system should be the least. – ( Hash Map for data storage is something i came up with and that was accepted. Couldnt come up with a solution for the entire problem.)

3rd F2F:

About project experience and how i handled it. Amazon leadership skills were mostly expected.

4th F2F:

Sum all the values of the nodes of a Binary tree that fall on the same column and print them.

The solution is to treat root as the center and any node that moves away from it (left/ right )one at a step is treated as under same column

5th F2F:

Print the values of a binary tree that occurs on the same level.

-Level order traversing.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 201 (On-Campus for SDE-1)

Aptitude Round: (1:30 hours)

20 MCQs

MCQs on processes, maths aptitude, and algorithms etc . Few output questions on pointers.

2 Coding questions: ( on hackerRank)

- Given 2 strings, check if any one of them has any anagram of the other string, as a substring of it.
- Graph question : ( not mentioned directly as graph, but was implied). basically Needed to find the shortest path between two given vertices in the graph.

Interview:

Round 1:

- BST to Doubly Linked List ( Geeks question)(code it)
- for Doubly Linked List to BST conversion, give an algorithm and prove its complexity using recurrence relations. => O(nlogn)
- On a number line from negative infinite to positive infinite, if you start from 0, you can either jump back or front. but every jump length is 1 more than the previous jump. Given a number on the number line, can we reach it using any combination of jumps. If yes, print the minimum length path. Hint: Solved using Queue storing all possibilities, something similar to BFS. and BFS search wud always give shortest path.

**Round 2:**

- Given an array of Integers, find the Maximum length subarray with sum equal to zero. Solved by constructing Prefix sum array for the given array. In prefix sum array, any number repeating more than once, implies subarray between those indices is 0, so store length of this subarray, check for other repeated values too. (careful coding required to eliminate bugs) Additionally had used a HashMap(java) to do this solution time efficiently. {code it}
- Return largest BST from a BT (geeks question) {code it}

**Round 3:**

- Tell me About your Internship project. ( It dealt with Performance bench-marking for embedded Systems ( SoC) with respect to latency and bandwidth done at Samsung R&D B'lore).
- Given a 2-D matrix of zeroes and ones, any row/column containing a single 1 is made completely 1. ( available on geeks) I told him I know the space and time optimized solution to it (as provided by geeks). Asked me to code it... had some bugs, took some time to debug a particular corner case.{code it}
- He Modified above question, providing conditions -> if there are no limitations on the space used, and if accessing each cell has a cost attached to it, how would you do the same problem in least cost.
- Given a tree with three pointers in every node, left, right and next, connect all the nodes at the same level in a spiral fashion. eg root's next points to right child which in turn points to roots left child which in turn points to level 2's 1st left child ... and so on... any node could have 0,1 or 2 children.( geeks)

**Round 4:**

- Given the function : int func( int n) { if(n==1) return 1; return n\* func(n-1)\*func(n-2) + func(n-1)\*func(n-2) + func(n-1); } // What is its space complexity.
- Given a in-coming stream of numbers (either 0, 1 or 2), Design a Finite state machine which tells me if the number formed by the input stream so far, is divisible by 3. eg stream state is "012" return true, coz 12 is divisible by 3.. for "0111" return false... {Design the FSM }
- Proposition logic question with 5 statements given, determine their truth. (Solved using common sense, but wanted me to prove it mathematically )
- Given an int represented in Big Endian form, convert into Little Endian, where the number of bytes taken up by int is not provided. Ex: if int is of 4 bytes and input integer n= A B C D , => o/p = D C B A => n2 ... where the alphabets represent a byte. return n2. Involved Bit manipulation. {Code it}
- The one thing you regret from the past 3 years in college.

**Round 5:**

- Introduce yourself.
- Given an n-ary tree, traverse it in level order, printing a particular element in each level( that particular number is returned by function "func1(int level)". Gave an O(N) time and O(N) space complex solution, followed by an O(N) time and O(1) space complex solution. {code it}
- Advantages/Disadvantages of a static variable inside a class in java.
- Performance implications of the static variable inside a function in C.

**Selected as a full time employee.**

**Tips:**

- Have a loud thinking, the interviewer helps you if you get struck. Ask ALOT of questions. At least he will know what you are thinking or where you are going wrong at.
- Write neat code,"take your time ....as much as you like".
- Make sure the interviewer has approved the algorithm before you start coding. Discuss full algorithm before you code. He may ask you to think in a more optimized manner.
- Study "[geeksforgeeks.org](#)" well, especially the tree sections, and dont mug up the code, its no use, you will not remember when needed, instead, understand why every minute detail of the code. This will take u further.
- Study basics of every computer related subject taught in class. No need to be experts, but having an idea helps.
- Mostly it is about data structures and algorithms. Make sure you are comfortable with them.
- Side note: Help others and just do good. Neither hard work nor luck pays. Its all about your destiny. Dont get worked up about these things. Life has more purpose.
- "Karmaane vadhi karaste ma faleshu kadhachanam.." – Gita

**above line means "Keep doing good deeds, dont expect rewards.."**

"Nasrum Minallaahi Wa Fathun Qareeb" – The Holy Qura'an

Above line means, "When comes the help of Allah, Victory is near"

**Best of luck**

**Thank You geeksforgeeks teams.. Thanx a ton**

**And thanx to my parents, and friends who helped me alot.**

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## GATE CS Corner Company Wise Coding Practice

# Amazon Interview Experience | Set 200

Aptitude Round: (1:30 hours)

19 MCQs

Easy MCQs on trees, semaphores, deadlocks and algorithms. Few output questions on pointers.

2 Coding questions:

- Check if two strings are anagram.
- There are n employees in a company, each having some ratings. The employees are given a hike in their salary based on their ratings, i.e employee with higher rating will get the higher raise. An employee can only know the hike and rating of two of his neighbors, one on the left and other on the right. Given an array of size n, specifying the ratings of n employees, find the minimum hike that should be raised for each employee, such that no employee feels unfair.

Example: 1 3 5 4 (ratings for 4 employees)

Output:  $1+2+3+2 = 7$

Example: 5 3 4 2 1 6

Output:  $2+1+3+2+1+2 = 11$ .

The hikes are positive integers only. The ratings are greater than zero.

Size of input array: 1-1000000

**Interview:**

**Round 1:**

- Given a no, find next no greater than n and having same digits. I was supposed to write a working code for this on paper.
- There is a robot that is initially at origin. A robot have three operations, he can either turn left or turn right, or he can move one unit ahead in the direction he is facing.

Given a string containing L (turn left), R (turn right), G (move one unit ahead). Find if the robot again reaches the point he has been before (find a loop).

Example: LGRGRGG

Initial co-ordinate is (0, 0), it turns left and moves one unit, updated coordinates (-1, 0).

Then turns right and moves one unit, updated coordinates (-1, 1). Then turns right and moves two unit (two 'G's). Updated coordinates are (1, 1).

**Round 2:**

- Given an 2-D array, implement an hash map which when given (key, value), insert and retrieve value in O(1). Also implement one more functionality that gives me all the keys for corresponding value in O(n).
- Given a graph whose vertex can have only two value, either 0 or 1. Find no of distinct clustered ones (island) in the graph. Write a working code for this on paper.



Black nodes – 1 marked vertices.

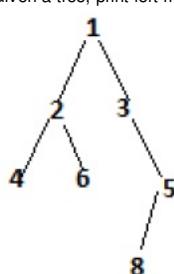
Ans = 2.

**Round 3:**

- Reverse a stack using only recursion.
- Create a data structure that maintains a record for all the courses and students enrolled for that course. Each course has course id, and student is uniquely identified by its enrolment no. The data structure should provide following operations:
  - Insert of a new student for a particular course.
  - Deletion of a student for a particular course.
  - Given a (courseid, enrolment no), search if this pair exists or not.
  - At any time you should be able to give the last enrolled student for a particular course.

All of the above operations should be executed in O(1).

- Given a tree, print left most and right most node of each level.



Output: 1 2 3 4 5 8

- Given a table that has amount has its column and an integer n, write a query that give nth largest amount value in the table.
- What are the differences between child processes and threads? Explain virtual memory, paging concept, page replacement algorithms. Design a data structure for working set algorithm.

**Round 4:**

- Questions on my internship and projects.
- Then the interviewer started asking questions on computer networks about framing and all. After asking 3-4 questions on CN, he then switched back to DS.
- Given a binary tree, find whether it is Binary search tree or not, without using any external dynamic memory for array. Write code for this.

- And then at last the aura got filled with all the never heard questions on OS and Computer Organization.

#### **Important tips:**

- Have a loud thinking, the interviewer helps you if you get stuck.
- Don't do silly mistakes while writing code, take your time but have a neat, optimized code.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

### **Amazon Interview Experience | Set 199 (On-Campus for Internship)**

Recently, Amazon visited our campus. 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 fulfilment centres, 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

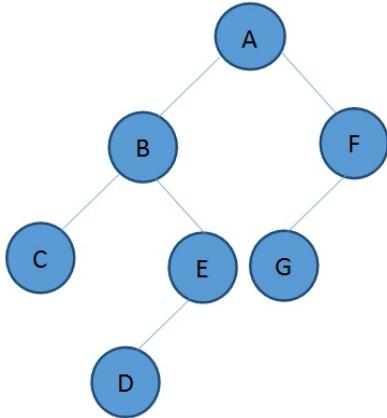
2 7 9 11 13 16

12

Output: 13

2. Given a binary tree, find the longest path in the tree. If there are two longest paths print the lexicographically first path.

EXAMPLE:



OUTPUT: D E B A F G

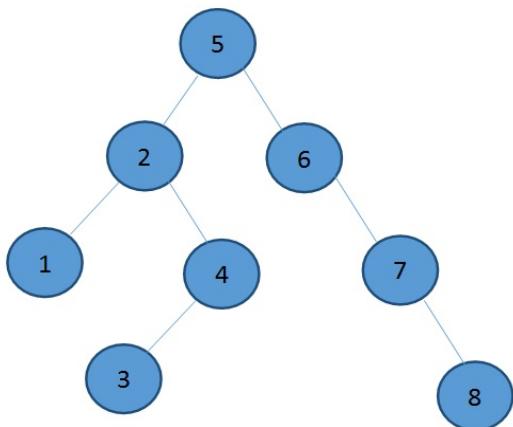
#### **ROUND 2: (DS CODING ROUND)**

1. Given a BST and 2 nodes in the BST, find the length of the path between the two given nodes.

Example:

Input: the below tree and node 3 & 7

Output: 5



#### ROUND 3: (F2F)

1. Given an array where the elements are in absolute difference 1, write an algorithm to search for an element in the array and return the position of the element. (return the first occurrence).

**Example:**

**Input:** 8 7 6 5 4 3 2 3 4 3 **search element:** 3

**Output:** 7

2. Given a linked list, check if it is a palindrome or not.

**Example:**

**Input:** madam **Output:** true

3. It was a scenario question based on facebook. I have to find all the mutual friends of my friends and my friends of friends of friends. This list returned should be in a sorted order. To perform the above action u are given a getfriend() function which will return the list of friends for that id.

Hint: use hashing

#### ROUND 4: (F2F)

1. It is a graph question. A 2D graph with x and y coordinates. Given millions of points in a graph, find the k nearest point to the origin.

Hint: use heap ( I used a priority queue )

2. Given a binary tree, a node in the tree and a distance k. Print all the nodes at a distance k from the given node in the tree.

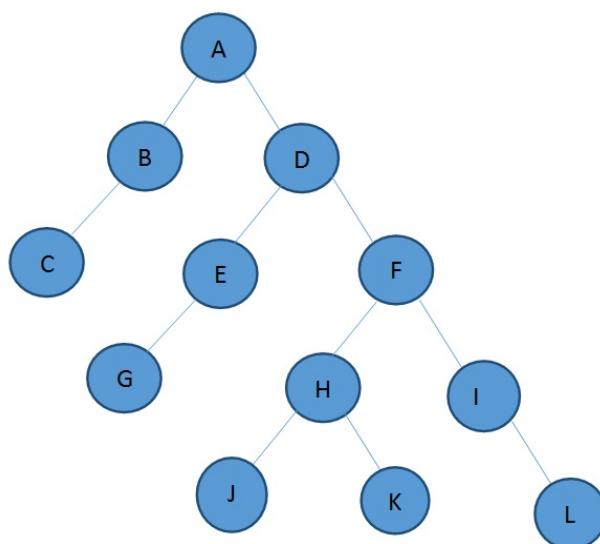
Example:

**Input:**

given node – F

K=2

**Output:** A E J K L



# Amazon Interview Experience | Set 198 (On-Campus for Internship)

Hello friends, Amazon recently visited our campus hiring for SDE. They are usually the first or second company to visit our campus, which gives little time for preparation. so better prepare yourself in summer vacations (read g4g).

I had great fun preparing for the Amazon, and really enjoyed myself through the interview process. The process spanned across two days. The interviewers were really nice and I really felt really comfortable throughout the interview process.

Let me share my experience with you.

### First round (1 hour 30 mins) (Apti + coding):

This was the online round, conducted on hackerank.

20 questions were asked from C/C++/Java outputs, OS, DS, Algorithms, etc.  
and 2 coding questions were asked.

**Q1)** Given a linked list, check whether it is palindrome or not.

<http://www.geeksforgeeks.org/function-to-check-if-a-singly-linked-list-is-palindrome/>

**Q2)** Given a matrix of NxM, consisting of alphanumeric characters, print the matrix spirally.

<http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>

After this round around 30 students were selected from 250 students.

### F2F 1:(1 hour 30 mins) (Technical):

This round started with some basic questions like 'tell me about yourself' and some questions on my projects.

after that coding questions were asked:

**Q1)** Given a matrix of NxM.

Now consider a submatrix in it having top-left coordinates as (x1,y1) and bottom right coordinates as (x2,y2).

Now many queries are performed in which (x1,y1) & (x2,y2) are entered.

We have to find the sum of elements in this sub-matrix in O(1) time complexity for each query.

Eg:

```
1 2 3 4
5 6 7 8
9 1 0 2
3 4 1 5
(0,0)-(1,2) : 24
(1,1)-(2,2) : 14
```

**Q2)** We are given an alien language, in which we dont know the arrangement of the letters.

Now we are given some words of that alien language in dictionary order.

using those words we need to find the order the the letters of the alien language.

<http://www.geeksforgeeks.org/given-sorted-dictionary-find-precedence-characters/>

**Q3)** We are given the preorder traversal of a BST, we need to create the BST using the given traversal.

But we can't use inorder traversal(i.e. sort the elements and use the array.)

and also we need to create the BST in single traversal of the preorder list.

**Q4)** We need to reverse a Linked List using single pointer. (in other words : recursively)

He asked me to write the code for reversal.

After this round some students were selected for second round of the interview process.

Luckily i was among them.

### F2F 2:(1 hour) (Technical):

This round also consisted of coding questions:

**Q1)** Given a tree, print the tree in Zig-Zag manner.

<http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

**Q2)** Given a sorted array, we need to find that element whose value is equal to that of its index value.

He asked me to do it in  $\log(N)$  time complexity.

**Q3)** Given a tree, now the given tree is special as in this tree all node has only 1 pointer which points to its parent.

Now, in this tree we are given any 2 nodes, and we need to find their lowest common ancestor(LCA).

Hint: This question is similar to intersection of 2 linked lists.

In the end he asked me if i had any questions to ask.

Thanks to geeksforgeeks

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.

## Amazon Interview Experience | 198 (For SDE1)

I have recently attended an interview with Amazon Hyderabad, for SDE-I position. All 4 rounds are conducted by different people from different teams.

There are 4 rounds in total.

1st and 2nd are on DS, Algos, PS

3rd is partially coding and partially design round

4th is managerial round.

Here are the questions that are asked in each interview:

### **1st Round:**

1. What are the traversals required to serialize and deserialize a binary tree?

And what about for BST?

Given InOrder and Post Order of a binary tree, construct the original tree back. Write the code.

2. From a large stream of integers coming continuously, Find the k smallest elements always at any particular time?

3. There is a Binary Tree.

Now you have to replace each node's data with the sum of its left and right child's data.

But the condition is that:

You should replace the node's data with sum, only if the sum > data

If the sum 10, you should not replace.

Instead keep the node's data as it is and replace left data as  $(20-6)=14$ .

Now root=20, left = 14, right=6. Now check the condition again from left, till you reach leaf nodes.

### **2nd Round:**

1. Given a set of strings. We are required to merge all these strings into a single string.

You are given with a merge(str1, str2) function, whose cost is sum of lengths of the strings passed.

How can you merge the strings, by making the cost as low as possible?

Write code of deleteMin, insert, percolateDown operations in Heap.

Solution:

Initially sort the strings in ascending order wrt their lengths. Now take out the first two strings and concatenate them.

Keep the resultant string in the sorted strings, wrt its length.

Priority Queue will be used to achieve the desired solution here.

2. Given a matrix of size m x n. Here m and n are very large, assume like 1 lakh.

You are given a series of submatrix inside this matrix. Find the sum of all elements inside each submatrix.

Submatrix positions are given in terms of its: top\_left\_cell and bottom\_right\_cell.

For eg:

input array: 5 x 6

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, 26, 27, 28, 29, 30

submatrix positions:

(3, 4), (4, 5)

which is

16, 17

22, 23

o/p is: 78

**Solution:** Since there will be multiple submatrix will be given for your, its not optimum to go element by element for each submatrix. Do some pre-processing, like build another matrix same size as input matrix, which will contain sum of its sub matrix. This way we can calculate the sum in O(1) time.

For the above example, the sum matrix is:

1x1 1x2 1x3 1x4 1x5 1x6

2x1 2x2 2x3 2x4 2x5 2x6

3x1 3x2 3x3 3x4 3x5 3x6

4x1 4x2 4x3 4x4 4x5 4x6

5x1 5x2 5x3 5x4 5x5 5x6

Now to find the sum of submatrix: (3, 4) and (4, 5)

sum = sum[maxRow, maxCol] - sum[minRow-1, maxCol] - sum(maxRow, minCol-1) + sum(minRow-1, minCol-1)

### **3rd Round:**

1. Design a newspaper subscribing system for a user.

What are all the systems to be considered as part of this design?

2. There is a stream of integers coming. At any particular point of time, you are required to give the first non-repeated element from it.

For eg: 2, 3, 1, 2, 1, 3, 5

o/p: If I ask you at 2nd position(after 3), the answer is: 2  
If I ask you at 5th position(after 1), the answer is: 3  
If I ask you at 6th position(after 3), the answer is: "No such element"  
If I ask you at 7th position(after 5), the answer is: 5

Solution:

```
Maintain a LinkedList, with the elements in insertion order
maintain hashMap with input integer as key and value as:
class IntValue {
    int count;
    LinkedList headNode;
}

Now when an element comes, check if the element is present in hashMap.
If(present in hashMap) {
    if(element count == 1)
        delete the element from linkedList,
        by replacing its data with its next element's data;
} else {
    insert the element into hasmap with count as 1
    and insert the element into linked list at then end.
}
```

#### Manager Round:

1. Google crawler question.

Given a set of N documents.

Given k strings: {str\_1, str\_2, ..., str\_k}

Now return the document numbers, which contains all the k strings.

2. Given an N-ary tree. Mirror the tree.

Give a suitable tree Node structure for this and write code for the same to mirror it.

eg:

```
i/p:
1
//| \ \
2 3 4 5 6
 /   /|
7     8 9
```

```
o/p:
1
//| \ \
6 5 4 3 2
 /|   \
9 8   7
```

I haven't done well in last two rounds. So I got rejected. But it was a nice experience altogether.

Thanks to geeksforgeeks for hell lot of questions. It takes at least a life time to prepare all the questions present in geeks for geeks, if we go by one question per day. Thanks.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 197 (On-Campus for Internship)

Hi folks, Amazon recently visited our campus hiring for SDE. They are usually the first or second company to visit our campus, but this time, they came in much later, which gave me lots of time to prepare (by prepare I mean go through g4g)

I had great fun preparing for the Amazon visit, and really enjoyed myself through the interview process. The process spanned across two days, and was definitely among the most comprehensive interview sets one could ever have. The interviewers were really chill and I really felt really comfortable throughout the interview.

Let me share my experience with you.

### First round (1 hour 30 mins) (Apti + coding)

this was the standard Amazon first round contest.

20 apti questions from C/C++/Java outputs, OS, DS, Algorithms, Time and speed, mixtures, etc.:-

As long as you are able to solve the coding questions you should be fine.

Q1) Given a set of time intervals in any order, merge all overlapping intervals into one and output the result which should have only mutually exclusive intervals. Let the intervals be represented as pairs of integers for simplicity.

Q2) Josephus problem with k = 2

The use of IDEs were disallowed, so be comfortable with coding on the HackerRank editor. The error reports there are a little difficult to comprehend, and so make sure you are comfortable with that.

Quite a few people were selected in 4 categories based on the scores.

**Round2: (1 hour 15 mins) Hand/paper coding round.**

1) Find the largest rectangular area possible in a given histogram where the largest rectangle can be made of a number of contiguous bars. For simplicity, assume that all bars have same width and the width is 1 unit.

They wanted a solution better than  $n^2$

2) Border traversal of a complete binary tree.

They wanted an efficient code, which traverses the tree only once.

They got the algos from us, and if they were satisfied, asked us to write code on the paper.

A lot of my friends who came up with efficient algos didn't make it through this round, as I believe they didn't get noticed enough

Amazon's hiring policy was to rather miss out a good candidate than hire a bad one, which was evident here. Around 20 people made it through this round (They also considered the previous round score (to an extent) for this round)

This is where the real challenge began.

**F2F 1: ( 1 hour 30 mins)**

we began with a little bit of chatting introductions etc.

We then directly moved on to the only technical question I was asked this round, which was not particularly an easy one.

Given a 2D array, find the maximum sum sub-matrix in it, also display it.

Working code was required, which was then tested with a couple of inputs, so there is no getting away.

**F2F 2(Manager round ~1 hour 45 mins)**

We started with a discussion about my projects. He wanted a detailed description along with all the technical problems faced and solutions used to counter them.

This went on for more than half an hour.

Then he gave me a couple of questions on trees, one of them was finding the vertical sum of nodes, given a tree, and working code for the same.

Questions on database management systems, and some other technical questions from my projects.

Then more questions, which I don't remember now.

Then it was my turn to ask him questions. He really liked the questions I asked him.

**F2F 3: Advanced Data structures and algorithms round. (~1 hour 30 mins)**

This was easily the most enjoyable interviews I have ever had for a variety of reasons.

It started off with a small discussion, and a "Tell me about yourself".

1) The first question was, "What are trees?" I said, "When people think of trees, they only conceive of binary trees, but trees can have more than 2 children... and so on"

So then he tells me that all his questions were going to come from whatever hints I give him from my answers to his previous questions.

So the next half an hour was spent on n-ary trees.

Serialization of n-ary trees.

Serialization of n-ary trees, where n is not known beforehand.

2) Some question, which reduced to finding the smallest element in a sorted-rotated array.

Code for the same, along with all corner cases. Make sure you write all the corner cases, in your first attempt itself.

3) Examples where trees are used in Real life, and in computers. This was a very lively discussion. He didn't accept "Family trees" as an answer, claiming that families these days do not follow tree structures any more.

One question leads to another, and some where I said graphs.

4) So next few questions were on graphs.

5) Given three strings A, B and C. Write a function that checks whether C is an interleaving of A and B. C is said to be interleaving A and B, if it contains all characters of A and B and order of all characters in individual strings is preserved.

6) So, after all that, He wanted an ELI5 (explain like how you would to a kid) version for all my projects, and the technology stacks I had used for them.

This meant that whatever answer I gave was 'too complicated' for him, and I had to simplify it, without using synonyms of "Somehow". Again, super fun.

I gave him a solution for a case where letters aren't repeated.

Then gave a solution by cloning and checking the strings as and when necessary, he wanted a better approach, and gave me quite a bit of time.

I then gave a DP solution, and he was happy with it.

After this, it was my turn to ask him questions. Again, a bunch of questions, to which I got some really great answers.

And finally, we concluded the interview with a nice talk about Snooker, and how the Chennai centre has a new brand new table

**Final Round (Telephonic) ~2 hours.**

Other than the telephonic conversation, we also used an online collaborator, which let him see what ever code I wrote on my laptop.

We started with a bit of introductions, (turned out that, we were from the same school), and general introductions, "Tell me about yourself".

He didn't have a copy of my resume, and he wanted me to make sure that didn't affect anything.

Lots of questions, like "Give me an instance where you and your teammate had a disagreement during a project, and how you resolved it"

"Give me a place where you showed some leadership quality to resolve conflicts", many other similar questions.

We then moved on to the technical questions.

1) Given a huge array which is stored across 100 computers, with no way to bring them all together, find the median of the above array.

I had already seen the problem with 2 instead of 100, and when I told him the answer immediately, it was evident, and so we moved on to the next question.

2) Given a chess board, and a starting position, and a set number of moves, find the probability that the knight will remain on the board after the moves are done.

Handle all the corner cases, like when if during the first move, the knight goes outside the board, that traversal ends there.

I had to code the entire thing, on the collaborator, and by habit I kept pressing ctrl+s, and hence, it kept disconnecting. \*facepalm\*

He was in a real hurry, but he still made sure he answered all the questions I had for him.

But he was not too satisfied my solution, and gave me time to improve and said he'd come back in 5 mins, but he didn't

#### General tips:

1) Prepare well, and concentrate on DBMS and OS as well.

2) Be confident, and be interactive.

3) Ask a lot of questions when you are asked to. This is a good time to show them you are interested in the company, and that you think beyond the coding aspects of the company.

Some of my questions were:

a) What makes Amazon any more customer centric than the other similar e-commerce websites?

b) How do programmers contribute to how the customer actually feels about the company? because coders do after all only implement what their managers tell them.

c) Given that this is such a tough interview, how many of such tough questions do you actually see in production?

4) Having a good resume' can help you guide your interviews.

Try to be original with your questions

And, all the best 😊

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## Amazon Interview Experience | 196 (On-Campus)

20 mcqs – OS, Apti, Puzzles, C, DSA

2 coding –

1. Merge intervals given in array
2. Variation of josephus problem with k=2

#### Interview Round 1:

A detailed discussion on my summer intern project . Questions testing the knowledge of N/W layer. I was asked to explain all the layers of TCP/IP model using the analogy of post office.

Program to find whether a BT is BST or not. (Handle duplicates as well).

#### Interview Round 2

1. Discussion of previous round interview questions.
2. Merge two BSTs(examine all cover cases)
3. Search in a rotated and sorted array.
4. Find maximum distance between two leaves in a BT.

#### Tips –

Only Hard work and Practice helps. Please be thorough with the OS,DBMS,N/W.

Luck plays its role too on interview day

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 195 (On-Campus For SDE-1)

20 mcqs – OS, Apti, Puzzles, C, DSA

2 coding –

1. Merge intervals given in array
2. Variation of josephus problem with k=2

#### **Interview round 1**

1. Find Largest Sub-Matrix With All 1s (Not Necessarily Square)
2. Search element in a sorted rotated array in only one (logn).

Some of my friends were asked –

1. Merge 2 BSTs
2. Diameter of Binary Tree
3. first positive element not in array(unsorted)
4. check binary tree is BST
5. search an element in a very large array, you don't know it's size
6. Decreasing sorted array given , make a balanced BST.
7. Generate all permutations of string.
8. 2 unsorted arrays given, find if there BSTs will be same.
9. Find a triplet a, b, c such that  $a^2 = b^2 + c^2$ .
10. Convert a BST into a DLL and DLL to BST in place.

#### **Interview Round 2**

1. Delete half nodes from binary tree
2. kth largest element in large array
3. All strings possible from a no. for example 26, Ans – "B", "Z", "BF"
4. Implement a stack with push(), pop() and min() in O(1) time, using Class concept.

#### **Tips –**

Only Hardwork and practice helps. And of course your luck on interview day

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

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## **Amazon Interview Experience | 194 (For Software Support Engineer)**

It was a usual Job Application at Amazon's Job Site, I got their call few days later.

Process:- 1 Written Aptitude(Coding) + 3 Technical Round + 1 HR Round

### **1) One Written Test** – 8 Problem statement – 1 Hour Time – from Basic to Mid-level difficulty, for which we have to write the Logic/Algorithms

Some which I remember were good enough are –

- i) Given a Folder path in a Directory Structure. E.g. "temp/reg"; you need to find all the files with extensions ".c" in this folder as well as in the sub-folders.
- ii) Finding the Longest Palindrome Sub-String in the given string.
- iii) From the given string, print the Alphabets which occur more than once in the string.
- iv) Given two Integers A & B, Print the number of bits to be flipped in order to convert 'A' to 'B'.
- v) Implement EnQueue() and DeQueue() of Queue DS using Push() and Pop() of Stack DS. Write Steps and Sequence.

Possible Solutions:- (Logic)

- i) Use Linked-List DS to store the Folder Path in a Node. Open the Folder with First Node, filter all the ".c" extension files, and add the sub-folders in the linked-list, until all the nodes in the linked-list are explored.
- ii) Use 'frame' variable with value starting from 2, increasing till size 'n', and check by shifting this frame by one position, if the sub-string is a Palindrome or not.
- iii) Basic Char to ASCII conversion and back to Characters. Create an Array of 26 slots for alphabets. Convert the input string to UpperCase before proceeding.
- iv) Convert to Binary Representation and Compare as String Characters. If not same, then increment the counter. Remember, we have to only display the Number of bits flipped.
- v) Use Operational Logic for Priority Queue, and for –
  - a) EnQueue – Push everything in Stack1.
  - b) DeQueue – (Check if Stack1 is Not empty)Pop everything from Stack1 and Push them one by one to Stack2. Then Pop top element from Stack2 as Result. For Next DeQueue do reverse, i.e. from Stack2 to Stack1.

### **2) 1st Technical Round**

- i) Write Program to Reverse a Linked List.
- ii) Discussion on a Scenario and Debugging/Troubleshooting the error.

### **3) 2nd Technical Round**

- i) The similar Debugging/Troubleshooting scenario.
- ii) Add the Numbers present in the String and display.  
E.g. "abc123def-567ghi89jk"  
Here take '-' as negative number symbol.
- iii) Find the Pair of Array elements summing up to value 'k', in a Sorted Array. Optimize it from Complexity ' $N^2$ ' to ' $N \log N$ ' using Binary Search.

### **4) 3rd Technical + Managerial Round**

- i) Some OS Related Questions.
- ii) UNIX Commands – Which I couldn't recall!
- iii) Project Experience and Why want to Join Amazon and similar ones.

Though I couldn't clear the 3rd Round, the overall experience was good.

#### ## Remember:-

>> Please check their Technical Requirement, and revise your concepts of OS(How Process works, Process Life Cycle, RAM, Virtual Memory, DeadLocks etc.), UNIX(Revise Basic Commands like 'grep' etc.).

>> Practice basic Problems like, Searching, Sorting, Fibonacci, Factorial, Recursion, Stack, Queue, Linked List and their Application.

Hope it helps for the new Applicants!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | 193 (For SDE-1)

I had interview with amazon.com for SDE1 position.

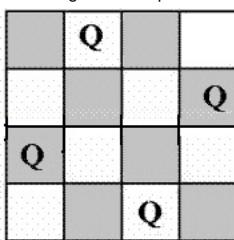
#### 1st Round – (Written Round)-

25 Multiple choice questions(Networking, OS, DBMS, C concepts)

2 coding questions were also asked, for which paper code was required.

#### 2nd round –

1. Placing N chess queens on an N×N chessboard so that no two queens attack each other. For example, following is a solution for 4 Queen problem.



<http://www.geeksforgeeks.org/backtracking-set-3-n-queen-problem/>

I had a long discussion on this question finally he was satisfied with my solution.

2. Write a program to find the sum of maximum sum subsequence of the given array such that the integers in the subsequence are sorted in increasing order.

<http://www.geeksforgeeks.org/dynamic-programming-set-14-maximum-sum-increasing-subsequence/>

3. Given a Binary Tree, check if all leaves are at same level or not.

<http://www.geeksforgeeks.org/check-leaves-level/>

#### 3rd round –

Given a sorted array arr[] and a number x, write a function that counts the occurrences of x in arr[]. Expected time complexity is O(Logn)

<http://www.geeksforgeeks.org/count-number-of-occurrences-in-a-sorted-array/>

Find k largest elements in an array. Elements in array can be in any order.

#### 4th round(Hiring manager)-

1. Questions around current job, challenges faced. Any instance of conflict and how you resolved it.

2. A lot of discussion on projects and work experience.

3. A large file is given you have to find all the anagrams. Told him to divide the file in chunks for parallel processing and then check anagrams using heap.

#### 5th round(Bar Raiser)-

1. Why you are leaving your current company so early?

2. An integer is given to you, first convert it into binary then reverse this binary string and print decimal corresponding to this reversed string.

3. He asked one question related to REALLOC function.

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.

**Tips:** Discuss various approaches with interviewer. Try to interact continuously with interviewer. They were very friendly during interview.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | 192

#### 1st Round –

1. Write code to create a copy of linked list with random pointer.

2. Print left side view of a binary tree.

#### 2nd round –

1. There is a stream of integers incoming. You are only concerned about finding whether a number exists in a window of k numbers. Write code to find the number with minimum number of comparisons.
2. Imagine you have four operations. 'K' (types k on screen), 'select all', 'copy', 'paste'. Find out maximum number of K's possible for given number of keystrokes.

#### 3rd round (Hiring Manager)-

1. Current position and work. Any challenges faced.
2. Why do you want to move and join Amazon ?
3. Suppose there is new UI feature given to you by Product Manager but you dont like it. If he insists that you implement it anyway, how will you handle this situation ?
4. An array of numbers is give. Write algorithm to divide this array in two subarrays such that difference of sum between these subarrays is minimum.[https://en.wikipedia.org/wiki/Partition\\_problem](https://en.wikipedia.org/wiki/Partition_problem)

#### 4th round (Senior manager) –

1. Questions around current job, challenges faced. Any instance of conflict and how you resolved it.
2. Find out whether a tree is a balanced tree or not.
3. Given an array of strings, sort it so that all anagrams come together.

#### 5th round ( team member )-

1. Find out whether a tree is BST.
2. Print all permutations of given string.

#### 6th round-

1. Rotate a 2D array by 90 degrees.
2. Print tree nodes in a level order. Each level on a newline.

Result- HR said that you will offered a job. But a week later I got rejected. I found their process highly arbitrary.

Practice code on paper and get to know on what criteria you are getting selected.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | 191

#### 1st round (data structures and algorithm)

- 1) Ladder of n steps is given. Find the number number of ways to reach the end point. I can take either 1 step or two steps at a time.
- 2) Find the k largest number in running stream of words.  
couldn't write the running program for the second question.

#### 2nd round (problem solving)

- 1) Every path from root to leaf add to a certain number, delete all the nodes which do not satisfy this condition.
- 2) Hash problem. To implement put(key,value) and get(key) in log(n) time.

Suppose there are key and value pairs like

(1001, 233) (2001, 3340) (8776, 9)

you have to perform get and put operations using function

```
hash(key)
{
    return key%1000;
}
```

and your own hash operations. Did it using hashmap with pointer to an avl tree.

```
divided the key with 1000.
suppose 1001%1000 = 1;
put 233 in 1st AVL tree, AVL tree will have structure like
node {
    int index;
    int value;
}
```

AVL will be constructed on the basis of index. index will be 1001/1000;

ie. if I have to put(3004,996)

3004%1000 = 4;

then go to 4th AVL tree using hashmap. Now compute 3004/1000=3;

My node will have index = 3 and value = 996. Insert this node in 4th AVL tree on the basis of index. Thus time complexity will be log(n) where n is the number of elements in Key%1000 AVL tree.

#### 3rd round (Hiring manager round)

- 1) About current company , explained everything in detail.
- 2) Then a large file is given you have to find all the panagrams. Told him to divide the file in chunks for parallel processing. Maintain an array of size 26 or instead of that, you can set the bits of a 32 bit number. Set the bit of a number so that you can easily check the panagram condition.

#### **4th round (data structures and algorithm)**

1) 2-d matrix service tax of different cities are given in the form of the 2-D matrix. Find the least cost to go from one city to another. You can travel only in two directions right or down.

2) Find all the nodes at a distance  $r$  from the given node  $n$ .

3) Find the sum of all bits from numbers 1 to  $n$ .

#### **Bar raiser**

1) About work experience, projects and current company

2) To find the shortest sub-sequence with maximum sum.

Practice writing code on paper and take care of corner cases.

You won't want interviewer to find faults in your code.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 190 (Delhi Drive)**

It was Amazon Delhi drive held in Jan 2015. This was conducted for various openings for Bangalore location.

**Round 1:** Conducted by SDE-1

1) Tell me about your work experience.

2) Store deepest right leaf nodes in a list. There can be more than one right leaf which are deepest and at same level. Approach was to find deepest right leaf node level and connecting all right leafs at that level in a linked list by inserting new node at beginning.

3) Count number of balanced brackets () .

**Round 2:** Conducted by SDE-2:

1) Stock buy sell to maximize profit

2) In running stream of integers find  $k$  largest integers at any point of time. (hashtable plus min heap approach made by day)

**Round 3:** Conducted by SDM:

1) Print matrix spirally from any point and using given direction. (This was very difficult to solve because usually the problem is simply print matrix spirally)

2) He asked about most challenging faced so far. (At some point of time I realized I was telling conflict but soon concentrated to tell a challenge. Please prepare behavioral questions beforehand and be specific. Nobody is sitting there to listen a story)

**Round 4:** Conducted by SDM:

1) Tell me about your entire work experience briefing each project starting from latest. He stopped at some points and asked tech questions.

2) What is the most conflicting situation faced and how you handles it?

3) What is the most innovative input you provided where you were appreciated by your manager?

4) Implement garbage collector. (Had no idea how to do that, but took some time and was able to tell an approach to maintain reference count in hashtable. He asked to code the approach)

Three rounds were completed on a day and fourth and final round was telephonic. My last round turned out to be negative because I was not able to write complete code in given time.

Still the problem asked in round 1 and round 2 were new to me and was able to solve those using different approaches which I have learned from Geeks for Geeks.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 189 (For SDE-1)**

Recently, I was interviewed for Amazon SDE-1 Position. There were two telephonic rounds followed by 4 F2F rounds.

Telephonic Round 1 :

He seemed a bit unprepared for the interview. He started with some introduction and knowledge transfer about current work and then created a binary tree and asked me to write the level order, preorder, postorder and inorder traversals for that tree.

Then, the coding questions followed.

1) Flattening a multi-level linked list.

1st approach → Using a queue :  $T = O(n)$ ,  $S = O(n)$ . Coded it.

2nd approach -> Same as on GeeksForGeeks <http://www.geeksforgeeks.org/flatten-a-linked-list-with-next-and-child-pointers/> : Didn't ask me to code. But this one requires changing the structure of data.

2) Flattening a multi-level linked list but the nodes in depth should be printed first. So, basically the 1st question resembles BFS and this one resembles DFS. Did this using recursion very easily.

3) Process vs Threads. What happens when you type in a URL? High-level design. Handshaking protocol. HTTPS protocol, etc

#### Telephonic Round 2 :

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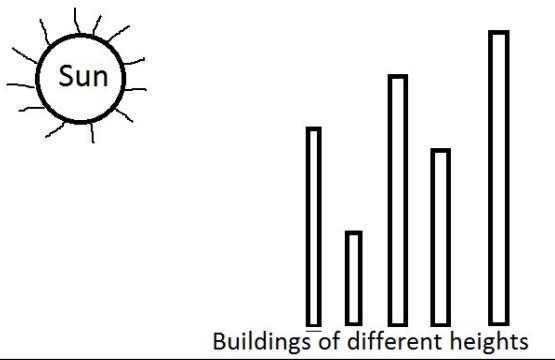
I must say this guy who interviewed me was really smart. This round was a little more than 1 hour and there were 3 questions.

1) BST to Singly Linked List in place. A slight modification of this problem — <http://www.geeksforgeeks.org/convert-given-binary-tree-doubly-linked-list-set-3/>. Coded it.

2) Finding Squares on the chessboard attackable by a rook

There is an NxN chessboard. Each square on the chessboard can be either empty or can have a rook. A rook as we know can attack either horizontally or vertically. Given a 2D matrix where 0 represents an empty square and 1 represents a rook, we have to fill in all the cells in the matrix with 1 which represent squares that can be attacked by any rook present on the chessboard. One can find a much simpler version of this problem here — <http://www.geeksforgeeks.org/a-boolean-matrix-question/>

3) An array of buildings is facing the sun. The heights of the building is given in an array. You have to tell which all buildings will see the sunset. This is pretty easy. The first building will definitely see the sunset and for the rest of the buildings, just maintain a variable `max_height_seen_so_far` and check with the height of the current building. However, he then twisted the question and asked what my approach would be if I was to scan the buildings from back to front rather than front to end. I used a stack and applied the logic similar to that used in Next Greater Element problem.



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#### F2F R1:

Started with introduction. A lot of questions about current company, current work, current project and then a design question.

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 suggested using a Binary Search Tree and justified the use of this DS. I gave an O(NlogN) solution. I was then asked to code it. I coded it in C#.

Followed with a lot of HR questions.

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#### F2F R2:

1) Reverse a sub array in an array. Pretty easy.

2) Rotate a subarray in an array where start and end indices of the sub array are provided and 'k' is provided which is the number of rotations to be done. The interviewer behaved really dumb in this question. All he wanted was a solution. He made me dry run the code again and again and he wasn't really bothered about the concept or the approach. I don't think he could relate to my solution which was O(n) in time and O(1) in space.

3) Find if a linked list has a loop. Old question. Take a fast and a slow pointer. But to get this solution wasn't really his motive. He asked why slow pointer should move by one node at a time and why the fast pointer should move at the speed of two nodes at a time. As led by the discussion, I was then asked to find the optimal speeds of slow and fast pointers for a given linked list. Again, led by the discussion, he asked if it's given that the linked list has a loop and the size of the loop is given, can I find the optimal speeds of the slow and fast pointers?

---

#### F2F R3:

1) Same question as Q3 asked in telephonic round with the only difference that the heights of the buildings was provided in a linked list. Coded it in C. Then, the interviewer twisted the question by placing the sun after the last building(previously the sun was placed before the first building). Used a stack. However, this can simply be done by reversing the heights array and using the same function written for the first part of the problem.

2) Design a data structure to represent the hierarchy of employees in an organization. Also, the design should be such that, you can retrieve the no. of reportees of a manager(not just the direct reportees but all the employees under him) very fast(O(1) was expected). Also, insertion of a new employee and removal of an employee should be fast too.

I suggested using a n-ary tree of hash tables. Also, used an additional hash table where key was employeeId and value was the address of the hash table (or the node) in the n-ary tree. My solution did give no. of reportees in O(1) and addition and removal of employees was in O(n) time, where n is the total number of employees. There wasn't enough time to code though.

#### F2F R4:

---

This round had a lot of HR questions. Cultural info. Current project. He also asked coding questions but he wasn't really bothered about the optimality of the solution.

1) Two nodes in a BST are swapped. Find them. Told my approach. Didn't ask me to code it.

2) Print all the permutations of a string in lexicographic order. Coded it. Took me a lot of dry runs to make him understand that the code is correct 😊

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### Amazon Interview Experience | Set 188 (For SDE1)

Recently I am interviewed for Amazon SDE-1 position for Bangalore. There are 3 F2F rounds followed by a telephonic round.

As it was a drive, they asked everyone to write code for these problems

1. <http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>
2. <http://www.geeksforgeeks.org/longest-palindrome-substring-set-1/>

#### 1st F2F:

1. Why do you want to leave your current company?
2. Why Amazon?
3. <http://www.geeksforgeeks.org/median-of-stream-of-integers-running-integers/>

I told him min heap & max heap method, then he asked me who can do it using trees.

4. There is a mxn matrix which contains only 1 & 0's. You have to print the unique rows. I solved it using tries, then he asked why cannot I use hash map and asked to write the code using tries.

#### 2nd F2F (Managerial Round):

1. Why Amazon?
2. Why leaving your current company so early?
3. Areas of Improvement , strengths & weakness
4. Given a prefix expression , convert into prefix tree and extended the qtsn for infix expression, time complexities etc.
5. Given a dictionary , and we have to query for anagrams for the word. extended the qstn to while typing the word we have to provide the autotype. Gave him a solun using tries.

#### 3rd F2F:

1. In a stack pop fn will return you the value & pop the value and push fn will push the value into stack , so how do you implement top fn. asked for O(1) solun.
2. Write a fun to check whether a given tree is a BST or not.

#### Telephonic Round (Bar Riser):

1. Why Amazon?
2. Asked about current projects and college projects.
3. Asked me which is the best project I have done and asked me how do I improve its functionality, discussion went on this.

#### Tips:

They will help you are struck just think loud.

Practice writing code on paper.

I thank GeeksForGeeks for this great work.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### Question in Amazon Interview

I have gone through few rounds while rest of the round questions are standard ones and already in the internet, I couldn't find this problem and couldn't solve properly.

#### Problem:

There are Items[I1, I2, I3, I4] available in warehouses [W1, W2, W3, W4, W5] and serviceable by multiple partners with some shipping cost.

I1 available in W1

– serviceable by these partners S1[0.75 -shipping cost/selection cost], S2 [0.74], S3 [0.70]

available in W2

– serviceable by these partners S1[0.75], S2 [0.74], S3 [0.70]

available in W3

– serviceable by these partners S1[0.80], S2 [0.74], S3 [0.70]

I2 available in W4

- serviceable by these partners S2[0.85], S3 [0.94], S4[0.30]
- available in W3
- serviceable by these partners S1[0.80], S2 [0.74], S3 [0.70]

I3 available in W1

- serviceable by these partners S1[0.85], S2 [0.55], S3 [0.70]
- available in W2
- serviceable by these partners S1[0.80], S2 [0.54], S3 [0.70]

I4 available in W4

- serviceable by these partners S2 [0.74], S3 [0.70], S4[0.30]
- available in W2
- serviceable by these partners S1[0.85], S2 [0.80], S3 [0.70]
- available in W3
- serviceable by these partners S1[0.80], S2 [0.74], S3 [0.70]

You have to optimally select the items so that total cost will be minimum.

Ex: I can make a shipment from I1, I2, I4 fulfilled by W3 which will cost:

- for partner S1: 2.40
- for partner S2: 2.22
- for partner S3: 2.10

Another Shipment I3 fulfilled by W2 which will cost: S2 [0.54]

Total cost:  $2.10 + 0.54 = 2.64$  with Shipment SH1 {I1,I2,I4} By S3 and SH2 {I3} by S2

Another possible way

I1, I3, I4 serviceable by W2 by Provider S2 : 2.08

I2 serviceable by W4 by S4: 0.30

Total cost: 2.38

So the shipments with minimum cost can be delivered/selected.

Write a program for the same to get optimum minimum cost for the number of shipments can be delivered from warehouses with shipping cost?

"If you ship multiple items in single packet, then the cost will be minimum. Assume Shipment Provider charges per packet and not on the weight and packing charges will be minimum. Idea is to consolidate/aggregate as many items as possible to one location so that packaging cost is minimum and on top of that you should consider warehouse selection cost."

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 187 (For SDE1)

Hi, Recently i was interviewed for Amazon SDE-1 Position in Hyderabad. There a telephonic round followed by 4 F2F rounds.

### Telephonic Round:

1. Given a array find all the triplets which satisfy the triangle property(sum of 2 sides should be greater than third side)  
<http://www.geeksforgeeks.org/find-number-of-triangles-possible/>

2. Given a array find whether it is majority array or not.

Complexity: O(n) Space complexity O(1)

<http://www.geeksforgeeks.org/majority-element/>

### F2F Round 1:

1. Given a dependency where for java packages p1,p2,p3

p1:{p2,p3}

p2:{p3}

p3:{}

This means p1 can be compiled when compilation of p2 and p3 done

p2 can compile when p3 is compiled

p3 can start as it does not have any dependence.

Figure out strategy to find the order of compilation of processes.

Ans:Topological sorting

2. Discussion on project

Asked all concept related to my final year project.

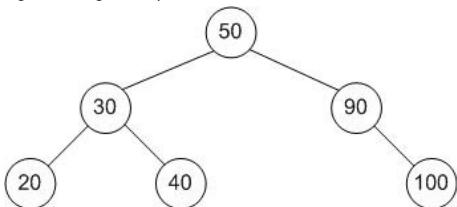
3. Current project in company

Challenges faced at company

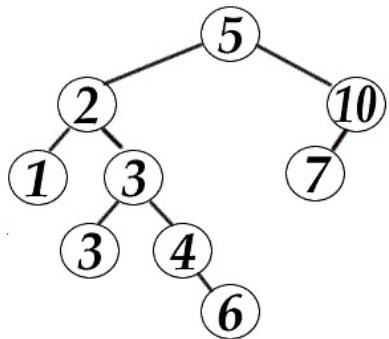
### 2F Round 2:

1. Given a binary tree print its side view from left from bottom to top and right side view as up to downward .

Eg. For image 1 output will be 20,30,50,90,100



and for Example 2( image 2) output should be 6,3,1,2,5,10,7,4,6



2. Given a string find largest palindrome sub string in it.

I gave him <http://www.geeksforgeeks.org/longest-palindromic-substring-set-2/> this answer .

then he asked me using DP

<http://www.geeksforgeeks.org/longest-palindrome-substring-set-1/>

3. What is virtual memory?

4. What is paging in OS?

## 2F Round 3:

1. Why are you looking for change in 6 months of experience .
  2. Discussion on how to send notification to friends when a user post on social network like facebook

The discussion was on when to load friend list of user and he was expecting we should load friend list when user login.

### 2F Round 4:

1. Discussion on current project challenges faced  
Situation when you have to take decision in absence of your team lead/Manager
  2. Why are you looking for change in 6 months of experience

3. Given a special binary tree structure given in image 3

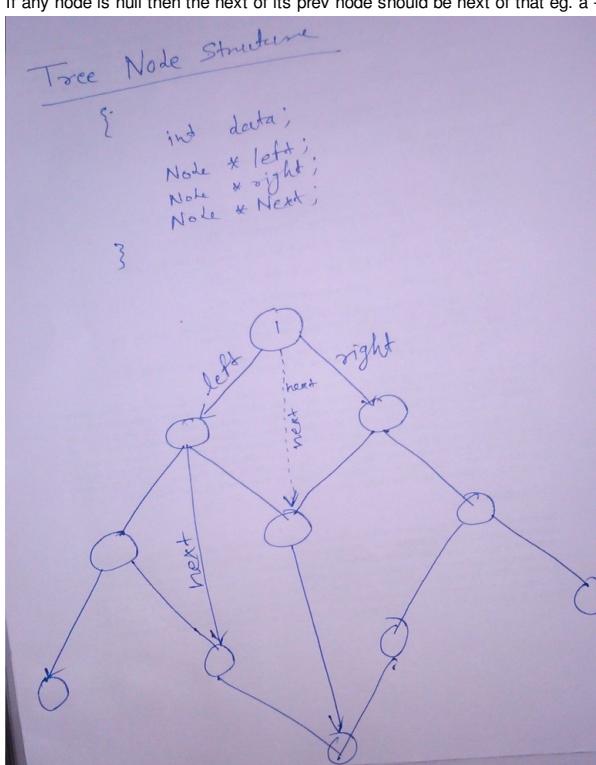
A node have 3 node pointers left,right and next

Two adjacent node share there left and right as shown in tree

Give tree whose node are set with next pointer as null.

you have to set the next pointer as shown in the figure

If any node is null then the next of its prev node should be next of that eg.  $a \rightarrow b \rightarrow c$  ( $a$ 's next is  $b$ ,  $b$ 's next is  $c$ ) if  $b$  is null then  $a$ 's next should be  $c$ .



4. What is virtual memory?
5. What is segmentation fault?

Note :- They expect fully working code in all round.

**Tips:**

1. Think loud they always support you
2. Ask for hint if not getting.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### Amazon Interview Experience | Set 186 (For SDE1)

Hi, Recently I was interviewed for the SDE-I for Amazon, Chennai.

Round 1(Online Round):

1. Given two linked lists. Add them.

e.g 1->2->3

3->4

Output: 1->5->7

2. Find if the binary tree has the given sum.

I cleared the online coding round and I was asked to come down for the face to face discussions.

Round 2(F2F):

1. Find if the given binary tree is height balanced.

Round 3(F2F):

1. Find if the given tree is the subtree of the big tree.
2. Given a sorted matrix (row-wise and column wise) , find kth smallest element.
3. Given an array. Pop min element in O(1) time.
4. Implement increment operator for the array.

Round 4(F2F):

1. Print the level-order traversal from bottom to up in a given binary tree.
2. What is process and thread?
3. What is copy constructor?
4. Design parking lot.

Round 5(F2F) (Hiring manager round):

1. Questions on achievements, challenges faced, area of improvement.,etc.
2. Given a file with millions of URLs. Some URLs repeating , some unique. Find the first unique URL.

Coding was required in each and every round. Think loud. Tell the interviewers what you think. Give them different approaches. Be confident about your solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### Amazon Interview Experience | Set 185 (For SDE1)

Hi, Recently i was interviewed for Amazon SDE-1 Position in Hyderabad. There a telephonic round followed by 4 F2F rounds.

**Telephonic Round:**

1. Inserting an element into a BST
2. A array is increasing and then decreasing find the point where it stops increasing.

**F2F Round 1:**

1. Replace all the elements in the array with its next highest element to its right

Expected O(n) Solution.

2. Given a binary tree and a value k. A path is called heavy path if the sum of the elements in the path (path from root to leaf) > k remove all the paths from the tree which are not heavy i.e., tree should contain only heavy paths.

**F2F Round 2:**

1. Given a array find all the triplets which satisfy the triangle property(sum of 2 sides should be greater than third side)  
Sol: sort then o( $n^2 \log(n)$ ) using binary search.

2. Given a dependency where for example process p1,p2,p3

p1:{p2,p3}

p2:{p3}

p3:{}

This means p1 starts once p2 and p3 are complete

p2 starts p3 is complete

p3 can start as it does not have any dependence.

Figure out strategy to find the order of execution of processes.

Ans:Topological sorting.

#### F2F Round 3:

1. Design a stack with push pop and find min operations in o(1) time.

Ans:can be done using 2 Stacks

2. Given an input string and a dictionary of words, find out if the input string can be segmented into a space-separated sequence of dictionary words.

Solution <http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem/>

#### F2F Round 4:

Discussion of projects and current work experience.

Diameter of a binary tree in o(n).

First devised o( $n^2$ ) then optimized to o(n)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 184 (Off Campus for SDE1)

I interviewed with Amazon, Hyderabad. Interview was in October, 2014. I was 4 months experienced, and was applying for SDE-1 position.

I had 4 interviews, and my experiences are as follows.

#### 1st Round

Q1 – Clone a graph. ( Similar Question -> <http://www.geeksforgeeks.org/clone-linked-list-next-arbit-pointer-set-2/>)

Basically while cloning, when you create a new node in the cloned graph, have a hashmap which maps the old node to new node.

So in the hashmap key = old node, value = new node.

Q2 – Given an array of numbers, for each number print the first number to its left which is greater than the current number.

#### Example

**Input** -> 5,3,2,4,8,6

**Output**-> -1, 5,3,5,-1,8

**Use stacks. Simple O(n) solution.**

#### 2nd Round

Q1 – Find the row number according to the excel nomenclature -> (the opposite of this, <http://www.geeksforgeeks.org/find-excel-column-name-given-number/>)

i.e given Z, **Output** -> 26

**Given AX, Output** -> 50

Q2 – Find the number of islands in a 2d Array -> <http://www.geeksforgeeks.org/find-number-of-islands/>

#### 3rd Round(Hiring Manager)

Q1 – Given a number in words, print the number.

**Example 1) Input** - "One Hundred and Five", **Output** should be "105"

**Example 2) Input** - "One Thousand and two hundred", **Output** should be "1200"

**Example 3) Input** - "Twelve hundred", **Output** should be "1200"

**Example 4) Input** - "Five Lacs", **Output** should be "500000"

**Example 5) Input** - "Five Hundred Thousand", **Output** should be "500000"

There were a lot of edge cases, and discussion with regards to this. ( I took a lot of time and the manager did not seem to pleased. )

Q2- In a sorted array, find two numbers whose difference is k.

**Given** -> 1,2,3,4,7,8,9,11 and k=7

**Output** -> 1,8 or 2,9, or 4,11 (Print any one)

<http://www.geeksforgeeks.org/find-a-pair-with-the-given-difference/>

A lot of questions as to Why Amazon, Why do you want to leave so early.

#### 4th Round(Bar Raiser)

Q1 – Given a sorted array find a number. (Simple Binary Search)

Now consider repetitions and find the left most occurrence. (Binary Search to first find number, then again Binary Search to find left most occurrence)

Similarly find the right most occurrence. (Binary Search to first find number, then again Binary Search to find right most occurrence)

Now using the above two functions, find the number of times the element is present.

Note – Cases like where number is NOT present,

Q2- Assembly Line Scheduling. (Very Simple DP.)

<http://www.geeksforgeeks.org/dynamic-programming-set-34-assembly-line-scheduling/>

### Result

After three weeks, I got a generic email saying that I could not clear it. I had a really irresponsible recruiter who did not have the courtesy to give me a call and just convey some feedback. Eventually, I think I took too much time with the first question in the manager round.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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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 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 about 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 182 (For SDET 1)**

### **Round 1: (Written Test)**

- Given a sorted array construct a Balanced Binary Search Tree.
- Given a linked list, find whether linked list is palindrome or not without using any extra space.
- Given set of strings find longest common prefix. If no common prefix present print null

Example: {abcd, abbd, abdy, az}

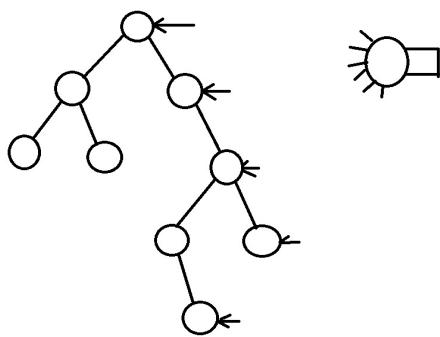
Answer: a

### **Round 2: (F2F – Problem Solving)**

- 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
- Given a brick of size  $1 \times 4$ , how many ways you can construct a wall of size  $N \times 4$

### **Round 3: (F2F – Data structures and Algorithms)**

- Give a binary tree, print all the nodes in spiral order with constant space
- Give a binary tree and a light source fixed placed right side of the tree. Print all the nodes where the light directly falls.



- Merge two sorted linked lists without using extra space

### **Round 4: (Telephonic – Hiring Manager from Seattle – All Questions on Testing and Projects)**

- Tell me about yourself
- Roles and responsibilities of your current role
- How do you test a search box
- Did you ever have a fight with developer over a defect? If you had how did you solved ?
- Few behavioral questions

### **Round 5: (F2F – Test Automation and Testing)**

- Design an automation framework
- 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)**

- Tell me about yourself
- 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 Narasimha Karumanchi
3. Data Structures 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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 were 3 coding question , out of which 2 were DS related and 3rd 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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

the output should be R.

Hope this helps some people.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 discussion 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 make 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 traversal) 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 baggage 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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, qstions 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 expect 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 children's 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](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_(company))

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.

Thanks Geeksforgeeks for providing such a good platform to prepare.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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  $i < j$

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:

<b>Input:</b> Array {1, 2, 3}
<b>Output:</b> A Balanced BST
2
/ \
1 3
<b>Input:</b> Array {1, 2, 3, 4}
<b>Output:</b> 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  $0 \rightarrow 2 \rightarrow 0$ ,  $0 \rightarrow 1 \rightarrow 2 \rightarrow 0$  and  $3 \rightarrow 3$ , 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 discussion 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.

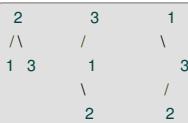
After solving the above one, he added a constraint on the above problem: (i.e) To find the diameter of the tree with atmost one turn

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,



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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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->

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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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: Find 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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on the GeeksforGeeks main page and help other Geeks.

Thanks Geeksforgeeks for providing very good platform to well prepare. A knowledge repository J

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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 linked 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 linked lists

#### 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 YouTube 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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 Palindromic 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

#### 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 also 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 difference 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.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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.

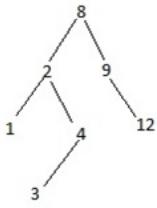
#### Round 1

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

**Output:** Search key = 3 should print "101";  
key = 11 shouldn't print any.

#### Round 2

- 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"

- 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

- <http://www.geeksforgeeks.org/largest-sum-contiguous-subarray/>
- Given a 2D matrix consists of only 0's and 1's find the longest diagonal of all 1's
- Optimization on above question with slight variations.

#### Round 4 (Bar Riser from US telephonic)

- 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

- <http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/> asked for minimum instead of maximum

- 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)

- Given a BST and a node (say target), find K nearest neighbors (<http://www.geeksforgeeks.org/print-nodes-distance-k-given-node-binary-tree/>)
- 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

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 concise, your interviewer has gone through hundreds of films, 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 standards 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.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### Amazon Interview Experience | Set 161 (Off Campus for SDE-1, Bangalore)

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 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 160 (For SDE 2)

Amazon sde2 experience:

**Telephonic round :**

Design a site similar to jumpee.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(diagonal 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 tree 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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# 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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## 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  $O(n\log n)$  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  $n \times n$  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  $T(n) = \sum_{i=1}^n T(i) * T(n-i)$ . I used DP as there are a lot of sub-problems used again and again.  $O(n^2)$ .

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  $O(n\log n)$  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 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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## GATE CS Corner Company Wise Coding Practice

## Amazon Interview Experience | Set 157 (On-Campus)

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 starttime 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 weaknesses? I said one, he asked me one more?

5) Lot of questions on my internship 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-in-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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **Amazon Interview Experience | Set 156 (On-Campus)**

### **Written Round:**

There were 21 mcqs and 2 coding questions hosted on hackerrank.

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 expression find the value of expression

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 = "rabbit", 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 minimising 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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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. Output 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 confirmed.

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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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  $\geq K$  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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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](http://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) Stock 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 start 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 sudo 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 discussed, 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 Manager's name and Fundamentals of join

-Other General Questions

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 serves different clients,

Now one client has requirement so that functionality changes, but other clients don't 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 patterns 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 chance 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 didn't get 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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.

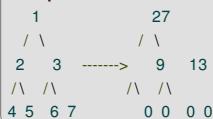
It's always good to ask questions at the end. It shows our interest towards the company.

## F2F 1

Overview of current job responsibilities and internship project.

1. Convert a tree to a sum tree.

### Example :



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).

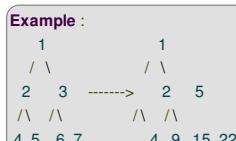
For all the questions, complexity of the program was asked and was being asked to improve both time and space complexity.

## 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 :



(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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Experience | Set 150 (SDE1 for 1 Year Experienced)

### Telephonic:

1. <http://www.geeksforgeeks.org/write-c-code-to-determine-if-two-trees-are-identical/>
2. <http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>

### Round 1

1. <http://www.geeksforgeeks.org/print-left-view-binary-tree/>
2. <http://www.geeksforgeeks.org/find-a-peak-in-a-given-array/>

### Round 2

1. <http://www.geeksforgeeks.org/find-number-of-islands/> (all 8 corners)
2. Don't 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

1. <http://www.geeksforgeeks.org/next-greater-element/> (use stacks)

2. <http://www.geeksforgeeks.org/array-rotation/>

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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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Amazon

### 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.



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  
Outputs: 3->2->1->6->5->4->8->7

Inputs: 1->2->3->4->5->6->7->8 and k = 5  
Outputs: 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Questions | Set 147

Written round:

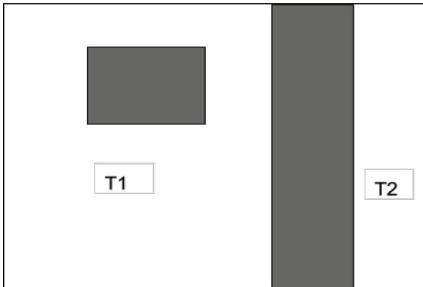
- Given a sorted array. Make a balanced binary tree from this array.
- A row and column wise 2d sorted array is given which only contains 0s and 1s in each row. Find the row which is having maximum number of ones.
- Find the next greater elements in array.

#### Face to Face 1

- Given a row and column wise 2d sorted array. Find an element in it.
- Given a row and column wise 2d sorted array. Find the kth element in this array.
- Given a tree T1 and T2. Find whether T2 is subtree of T1 or not. If not return -1.

#### Face to Face 2

- 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.



- A big unsorted array of numbers are given. Each number is big of almost 10bits. How to sort these numbers?

Ans-Counting sort

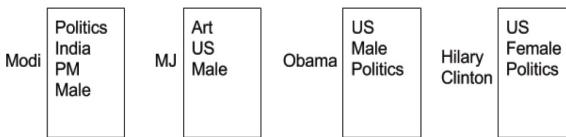
- An Adjacency matrix is given which is represented by 2d array. and each field is having cost associated. You are also given source and destination points. Find the maximum cost to reach from source to destination.

#### Face to Face 3

- Discussion on work in my current company.
- What is memory corruption, stack overflow, memory not available.
- What is difference between multiprocessing and multithreading? Do all threads of one process have their own code, bss, stack and heap or it is common for all.
- What is Tail recursion. How tail recursion works.
- Can we overload a function by only changing its return type?
- How virtual table works and lots of C++ concepts.

#### Face to Face 4 (With Manager)

- Tell me about yourself.
- What is the most challenging condition you have tackled in your life.
- What will you do if you have conflict with your manager.
- Guys this question brainf\*\*cked me. The question was based on "20 question game". I never played this game. This was the actual question-



Given a set of words like Modi, MJ, Obama, Hillary Clinton. We need to create an 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 choose 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 asks "PM" tag and computer will show the popup "Modi".

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## Amazon Interview Questions | Set 146

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

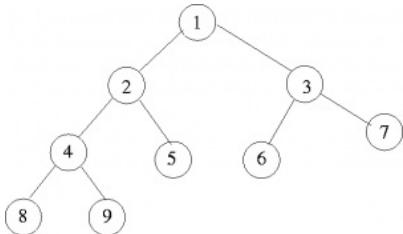
**Problem statement:** In a binary tree, a chain can be defined as sum of length of the left node series, right node series, and 1. Find the length of longest chain in the tree.

**Example:** Refer to the image given below –

Chain length of node 1 =  $3 + 2 + 1 = \{ \text{count of 3 corresponds to node 2 , node 4, node 8 ; count of 2 corresponds to node 3, node 7 ; 1 corresponds to node 1 itself}\}$

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.



#### 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

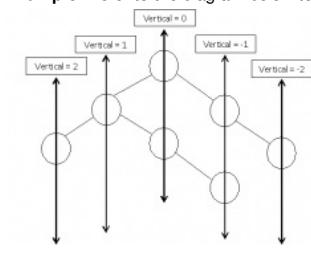
–

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 its 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.



?

#### Sub questions:

- \* Provide a solution and also provide a working code for the same.

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### GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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]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)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 zigzag 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 met the deadline and what do you have learned from that? etc

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 bool isValidWord(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 patterns 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  $M \times N$  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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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.

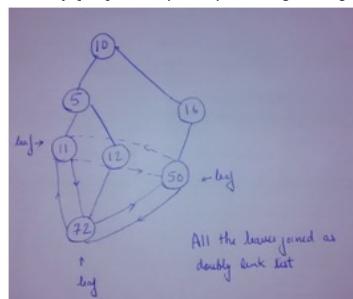
<http://www.geeksforgeeks.org/fix-two-swapped-nodes-of-bst/>

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  $a[i] < a[j] < a[k]$   $O(n)$  time. Code was required. 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.

### 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 of 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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## GATE CS Corner Company Wise Coding Practice

Experienced Interview Experiences  
Amazon

## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 O(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 capabilty)

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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 @ Hyderabad 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/>

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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### 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 O(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 then 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.

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# 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:

- Given a number N, find the number of correct combination of parentheses possible.

**Input:** N=2 => ()()  
**Output:** 2 [(())(), ()()]

**Input:** N=3 => ()()()  
**Output:** 5 [()(), ((())), (())(), (())(), ()(())]

- Print all root to leaf paths using iterative algorithm in linear time.

### Round 2:

- Given 'm' and 'n' ( $m < n$ ), print all nodes between levels 'm' and 'n' in level order.
- Print a matrix in spiral order.

### Round 3:

- Check if two trees are mirror images of each other.
- Given inorder and preorder traversals, build a binary search tree.
- 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:

- Given a singly linked list and a value 'k' such that

**kF2F – 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:

- Detailed discussion of current projects.
- 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  $O(N \log N)$  solution and he was pretty impressed. I was then asked to code it.
- 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:

- 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.
- Design a parking lot system. She was very much concerned with all the edge cases.
- 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 :  $1 \leq k \leq 4$

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 cfj

#### 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 –  $O(1)$  ;  $n \rightarrow$  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 –  $O(n)$  ;  $n \rightarrow$  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 .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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):

- 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

- <http://www.geeksforgeeks.org/forums/topic/find-a-string-inside-a-2-dimensional-array/>

#### F2F 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.

- A simple question on Tree data structure which i don't remember.

- Questions related to my project.

#### F2F 2:

- 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

- Questions related to my project during my internship.

#### F2F 3:

- 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.

- Describe ACID property of a transaction (DBMS).

#### Bar Raiser(Telephonic):

- 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 on.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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 to 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

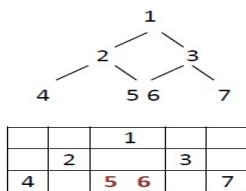
<http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>

#### 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.



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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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.

- Write code to implement Hashmap in Java. It should accept any datatype and also objects.
- Provide a high level class design for cab management system. Finding available car anytime and booking it, customers, orders, etc.

#### Face to Face Interview 5 (Bar raiser)

Tell me about yourself.

Why career change ? Why Amazon ?

- What is your biggest achievement ?
- Discussion about my project. Discussion about the tasks which I have done.
- Tell me about a situation where you had a conflict with your manager and how you resolved it ?
- What is the biggest bug have you made ?
- Have you developed any tool, which is used by your colleagues ?
- Is there any task which you feel, that you could have done better in your project ?
- Have you suggested any ideas and improvements to your project, beyond your call of duty ?
- 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)

- Given a binary tree, how would you serialize it, store in a file and then recreates it again from the file ?
- 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 ?

- Given Rank, Get the Name and Score
- Given Name, Get the Score and Rank
- 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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):

- Given a linked list. Check whether it is a palindrome (without using any extra space).
- Write a program to return the mirror tree of a given binary tree.
- Given a 2-D array, Rotate it by 90 degrees.

#### F2F-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.

- The interviewer told me to code a level order traversal in a binary tree.

- 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:

- Brief discussion of work in current company

- 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 an 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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](#) – Little difficult problem on backtracking.
2. [Given an array, find the count of impossible triangle](#)

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 whose 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.](#)
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.](#)
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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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: aabcbabc

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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## GATE CS Corner Company Wise Coding Practice

# 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.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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



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 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 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.
2. I used to do problems regularly in [leetcode.com](#)
3. [careercup.com](#) helped to go through the interview experiences.
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](#) by logging in.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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/>

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](http://www.geeksforgeeks.org) – my guidebook.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

# 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};

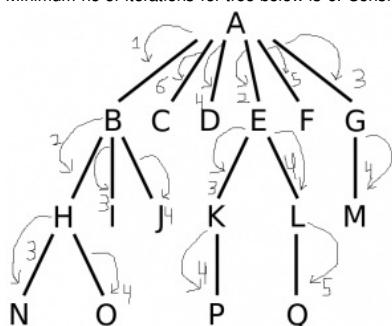
For every question I was asked to write a working code with all corner cases handled. I impressed the interviewer very much in this round :). Then I ask him some questions like – how an intern contribute to the amazon's claim to be the most customer centric company and a few more.

## 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 than 7. So 6 is the minimum answer.



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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

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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 choose 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 sibling 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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### 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 ( $\max(\text{arr}[i]-\text{arr}[j])$  where  $i \geq j$ ).
- 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.

- 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.

- 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## 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
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/>)

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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

### 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.

- 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/>

- 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

- Given an array of 0s and 1s sorted. Find the first occurrence of 1 ( Binary Search)

- 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/> )

- 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.

- 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/>)

- 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
```

- Implement a stack using array. Implement two stacks using an array. Implement 3 stacks.

- 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

### Amazon Interview | Set 116 (On-Campus)

#### Round 1:-

20 MCQ's(Majority from OS and Java, C++, 1 aptitude)

2 coding questions.

- 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.

- 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 partitioned) so that I can find the celebrity 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **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 allotted 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 occurred 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 occurrences of pat[] and its anagrams in txt[].

Assume that n>m.

Example: txt[] = "BACDGABCDA" pat[] = "ABCD"

Output: 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 me 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 hasConflict, 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 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  $O(n \log n)$ .

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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## 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 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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.



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

2. 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

### **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** 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 subarray 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 modifications. 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 Memory (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](#) has helped me to get through the MCQs in the online round. Thanks again !

Keep Smiling !

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **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](http://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.

- 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 :

- Merge overlapping intervals(Very well known repeating problem).
- 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:

- 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 ).

- 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:

- 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

- 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 abcdadhhhhzppz!
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:** aaabbccdefggaaa

**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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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-1:

- 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
 Amazon

## 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 exactly 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon

## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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

#### 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 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 :

- 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

- 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

- Discussion on Project.

- 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.

- 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

- Discussion on project.

- Code : LCA of BST.

- Code : LCA of Binary tree.

- Discussion on heap and stack.

- Code : Maximum subarray sum.

- Os concepts : What is semaphore? Brief explanation on wait() and signal() operation.

##### Round 4 : PI

- Discussion on oops concept. Asked me about copy constructor, virtual function, virtual class,

Template, exceptional handling.

- Discussion on Os concepts. Semaphore, different page replacement algos.

- LRU implementation using stack ( I was not allowed to use any other data structure).

I did it using two stacks.

- 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 :

- Discussion on project.

- Discussion on different types of sorting techniques.

Difference between merge sort and quick sort. When and where are they used.

Discussion on counting sort.

- Discussion on hash-map.

Design a data structure which will provide the same function as hash-map.

- 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)

- Code : Convert little endian to big endian.

- Code : Kth max in a file.

I did it using min-heap, then he asked me to use other data structure. Then I did it using Balanced binary search tree.

- Code : Find the second non-repeating character in a string.

- Given prime number p>=5 :

Prove that :  $(p^2 - 1)$  will be divisible by 24.

- 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 thank GeeksForGeeks which helped me to improve my knowledge and understanding of Data structures and Algorithms

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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)

#### 1<sup>st</sup> 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

#### 2<sup>nd</sup> PI

General Introduction about myself and asked me my Weakness and strength 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

#### 3<sup>rd</sup> 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. 1<sup>st</sup> 1 zero then 1 one then 2 zero then 3 one and so on

Ex –

INPUT – 00101111011101011000

OUTPUT – 010011100001111110 (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 2<sup>nd</sup> maximum number from a table using SQL query
5. Check whether a grammar is ambiguous or not

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

### **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  $i = 1 \dots \infty$ .  
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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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



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..



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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 :- aabccddeeff 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

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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**?
2. What is the **use of virtual functions**?
3. What are pure Virtual functions?
4. Syntaxes of Virtual functions and **pure virtual functions**?
5. What are **abstract classes in C++**?
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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon

## **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 youtube 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 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 O(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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## GATE CS Corner Company Wise Coding Practice

## 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 parallelly).
- 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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## GATE CS Corner Company Wise Coding Practice

## 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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  $M \times N$  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, adj should 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 an undirected graph?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

### 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 (Programming 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 is 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 colleague etc etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon Interview Experience

## Amazon Interview | Set 88

#### Online Test:

- Rectangle overlap problem
- String searching problem
- 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

- Given a BST, transform it into sum tree where each node contains sum of all nodes greater than that node.
- 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

## **Amazon Interview | Set 87 (For SDE)**

I recently cleared the Amazon SDE position. Through out my preparation 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

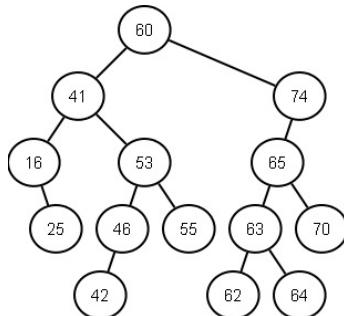
**Example- Input** 12 15 22 09 07 02 18 23 27  
**Output** 15 22 27 18 18 18 23 27 -1

- 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 away from leaf.

Input is below tree and k = 3



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 0'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' (here 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

<http://www.geeksforgeeks.org/vertical-sum-in-a-given-binary-tree/>

I gave the solution using Hash map, but he was not satisfy with answer. He told to give 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

<http://www.geeksforgeeks.org/inorder-tree-traversal-without-recursion/>

#### 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.

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.

## GATE CS Corner Company Wise Coding Practice

# 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 Authormame 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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## GATE CS Corner Company Wise Coding Practice

# 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 call 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 :)

## 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 5<sup>th</sup> 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  $(n^2+n+1)/2$  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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## GATE CS Corner Company Wise Coding Practice

# 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 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 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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Interview Experiences  
Amazon  
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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  $\leq 2 \times$  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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## **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 scalability, 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 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 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 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 : a3b2c2d2e2ab2

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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## 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 the point of writing there are multiple 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 separate 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 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.

- 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.

- 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 :

- 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.

- 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 array and incremented/decremented the indexes as needed.

- 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

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

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 Experience

### Amazon Interview | Set 77 (Off-Campus For SDE-1 / 1.5yrs experienced)

Amazon SDE1 Off campus

#### 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  $\leq$  length of input 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. 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.

## GATE CS Corner Company Wise Coding Practice

Experienced Interview Experiences  
Amazon Interview Experience

# 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, they are quite helpful. Try to discuss the various approaches that come up in your mind if you are stuck somewhere.  
All the best.!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

# 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 -> (((),))()
```

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

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

### 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: aabcdefgfhijklm – efghijklm

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
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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

### 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 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  $2^{\text{c}} > \text{e}$  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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

## **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)**

- Asked to explain how to check Binary tree is BST? then asked me to write whole code of it.
- Then asked me about assembly line problem. <http://www.geeksforgeeks.org/dynamic-programming-set-34-assembly-line-scheduling/>
- 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

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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:

abcabcb

length of longest substring with no repeating characters: 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon  
Interview Experience

# 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 1<sup>st</sup> 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 1<sup>st</sup> 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon

## 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 be 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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## GATE CS Corner Company Wise Coding Practice

## 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 of 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 an 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, it's 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 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 reappearing customer( the one who visits after 24 hrs)(algo)
2. In a paragraph 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, then 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 fights 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 a 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 problem into sub problems....) Remember the file is very large.

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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 module 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 possible 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 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 matrix, 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 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

2<sup>nd</sup> 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.

3<sup>rd</sup> 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.

4<sup>th</sup> 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 explanations 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 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 contains 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 < 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 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 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 its 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 their 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  $O(N^2)$  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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## **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  $O(\log n)$  solution. He asked me how it is  $O(\log n)$ . 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  $O(\log n)$ 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 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.

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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:  $k \geq 2$

#### **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.  $K \geq 1$ ,  $M \geq 1$ ,  $N \geq 1$ . 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 previous 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

## **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 arbiray 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 )

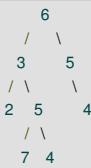
-> Lot of OS questions . Mutex,semaphore,Deadlock ,Virtual memory , Scheduling algos .

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 )



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

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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  $\text{ceil}(n^*n/3)$  knights. Then he asked me find a better solution. Finally I got to  $\text{ceil}(n^*n/2)$ . 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 preferred 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. Retrieval should be O(1) (if you give O(n) retrieval, 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. Don't 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

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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.

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.

### 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).



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.

## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon  
Interview Experience

## 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 = "abcdefghijkl" and r = 3

so filling column wise would give :

a d g  
b e h  
c f

and final ans would be adgbbehcf.

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  $O(\sqrt{n})$  solution. Later solved with binary search( $O(\log n)$ ).

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 ext

```
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)

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.

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** two pointers.

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 good to hear about it.

### 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 : columnNo, Node. it would store the last visited node of that column. So whenever we visit a node, first we check if its corresponding

He deed the dry run **with** example **and** code **and** he was OK **with** final approach.



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

Many Many congratulations to the Priyank. If you like GeeksforGeeks **and** would like to contribute, you can also write an article **and** mail your article to contribute@geeksforgeeks.org

## GATE CS Corner

### Company Wise Coding Practice

# 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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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Amazon  
Interview Experience

# 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



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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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).



{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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 Quantitative 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
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## 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 Quantitative 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 – odll

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  $(a+b) \bmod 100$  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 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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## 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  $p \times q$  such that it fill n elements(n given) Such that
  - a) matrix should be nearest to a square matrix and
  - b)  $0 > n$  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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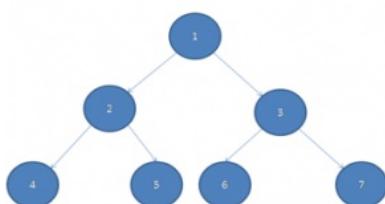
## Amazon Interview | Set 45 (For Internship)

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.



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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### 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 loses the game. You have to tell that for given n coins who loses 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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### 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 person 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 picks 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, you 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 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 length of longest path in a binary tree(diameter). I gave a  $O(n \log n)$  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 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 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(5|3,2)

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

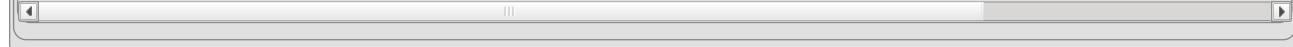
Sum(linkedlist1, linkedlist2, linkedlist3)

We had to print the linkedlist form of the digit.

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## GATE CS Corner

### Company Wise Coding Practice



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



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 he talks about his internship experience and how it benefited him.

You can also download his [resume](#) 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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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

## **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 :**

- Given a linked list and 2 integers M and N.. Keep M nodes and delete N nodes repetitively till the end of linkedlist.
- 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.
- Given a BST and a value , check if the path sum from root to leaf equals the given value.

### **1st F2F round:**

- 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.
- 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 ->iyah

how ->woh ->ohw

done

are

### **2nd F2F round:**

- Given a linked list , print the nth last node. He asked me to give the optimised solution for it.  
solved using slow pointer.

- Find the LCA in Binary Tree

He asked me to optimise the code with bottom up approach and gave lots of boundary conditions

- 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

Solved it with double ended queue.

### 3rd F2F round :

a) Given a chess board of finite length , start position 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 .

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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",

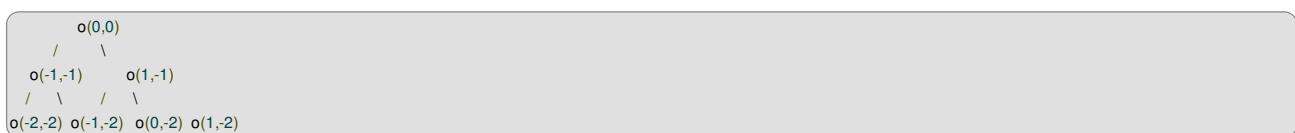
- ii. Show all types of shirt having size "small" and pattern "check" etc. etc.

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)



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

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 be 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 radii 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 occurring max no of times.

Soln: Simple one. Take auxiliary array of size 256 and maintain frequency of each char. Scan auxiliary 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 acquires 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.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 greatest 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 asked 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 probability that he will be inside after N hops.

On a condition that if a knight moves outside then he will remain outside he can't come inside.

For eg. (x,y)=(0,0)

n=2

probability=(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

This article is compiled by anomaly404. 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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 the index of the parent of every element, I had put -1 for the first element, at the end I backtrack the array to find 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

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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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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](#)

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(n<sup>2</sup>) 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.

## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

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

Output: 13 5 18 15 11 20 7

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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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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

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## 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, ccacccaccaca 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  $m \times n$  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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

### 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 initially.)
2. WAP to encode and decode string.  
aabbbcccd 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 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.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

### 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(mxmrxn) 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

# 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 !!

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

### 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 from a BST whose sum was equal to k. I answered it using a preorder traversal to get a sorted array and then starting two index from both ends to find if two elements with sum as k exist or not. He then 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 preorder and reverse preorder fashion and it took some time to code. Dry run of the code seemed to be right but I wasn't 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 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 is 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 maybe 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 an array/hash. Whenever we move left we decremented the index while moving right we incremented 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 able 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 then 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 choose 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 adjacency-list but 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 an 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  $m \times n$  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.*"

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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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

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### 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,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  $O(n\log n)$  . 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.

## **GATE CS Corner Company Wise Coding Practice**

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## **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.

## **GATE CS Corner Company Wise Coding Practice**

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## **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 occurrences 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 contain 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 cache , 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 search 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 contain several other URLs and they also contain 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 a 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 through 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 by last one followed by 2nd first one followed by 3rd 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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## **[TopTalent.in] Google, Facebook, Amazon, Walmart & PocketGems, All Fighting For Prasoon Mishra**



Meet Prasoon, he was just your average guy who studied at IIIT-Hyderabad but today Prasoon Mishra is one of the most well known 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](#) 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, it's 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 tickled 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: What's 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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### 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:**

- General code for coin denomination problem where the input was an array containing the coin denomination and the sum we want.
- Rectangle overlap problem(Can be found in geeksforgeeks)
- String Matching Problem(Wrote KMP)

**Telephonic Interview:**

- Convert BST in place into doubly linked list
- 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**

- Given a number is it divisible by 3 and 5
- Only catch here were the edge cases and nothing else
- angle between hour hand and minute hand
- Reverse bits in a binary
- Get the kth node from end of linked list

**F2f interview(round2)**

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

## GATE CS Corner Company Wise Coding Practice

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## 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 linked 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 can't 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.

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Interview Experiences  
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## 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. A singly linked list. Can have a loop. Detect it and find the size of list.
4. A singly linked 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):

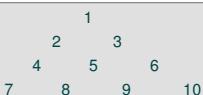
1. Given a binary search tree. Find two numbers in the tree whose sum is k. If there are no such elements, state so. Assume that the tree is balanced. O(n) solution with O(logn) space was expected. Solved using two stacks. Code was required.
2. Copy a linked list with next and random pointer. Not allowed 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):**

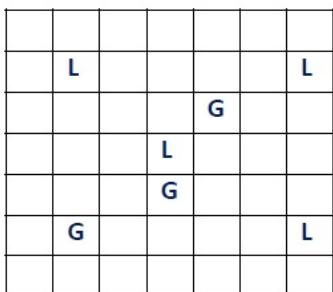
- Given N buckets each of capacity 1L numbered from 1 to N. Buckets are arranged in a form of a 2D Pyramid shown below.



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

`float getWaterInBucket(float x, int n);`

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

**Face to face: Round 4(Manager, 1 hour 20 minutes):**

- Tell me about yourself.
- Why do you wish to move out of current job?
- 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)
- How big is the team & what is your role?
- Proudest project that I have worked in my current company. Details.
- Any instances where you are not satisfied with what you did?
- Any instances that you felt the need for improvement in some areas, which could have helped you technically and professionally. Any negative feedbacks.
- What happens when you type in a URL on browser?
- 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.
- 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):**

- Tell me about yourself. It starts with a basic intro round, where your communication skills are judged.
- Why changing the job?
- Explain in detail the current project. In depth information.
- Given a binary tree. Tell if all the leaves are at the same level. Code was required with proper handling of boundary cases.
- 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.**

- GeeksforGeeks
- Careercup
- Introduction to Algorithms(Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein)
- 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.

**GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon  
Interview Experience

**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.

I/P: 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. Memoization –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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

## 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 dequeuing enqueue its children 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 so 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

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.

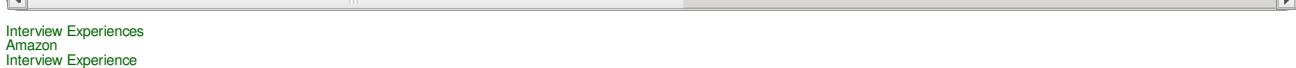
After the interview process is done all those who took your interview will sit and judge (That's what HR told me 😊 )

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

Thanks to Geek4Geeks 😊

## GATE CS Corner

### Company Wise Coding Practice



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



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 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](#) 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!

**Team TopTalent:** What was going through your mind when you had to choose one out of those 6 offers?

**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.

*(Wasn't really a surprise for us. Google seems to be the first choice for most Indian programmers)*

**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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Goldman Sachs  
Google  
Interview Experience  
Microsoft  
Samsung  
Tower Research

## 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.

- 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.
- Print the level-order in reverse order, i.e. from Bottom to top.
- One more easy question, which I don't remember now.

**2nd Round:** F2F- Developer

- 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.

- 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

- 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.

- 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

- 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.

- 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

- 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.

- 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.

- 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.

This article is compiled by [Mohit](#). 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

# 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[j][i];
```

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Interview Experience

**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.

## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
[Amazon](#)  
[Interview Experience](#)

## 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](#)

**Solution:** Do reverse Inorder 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.

## C

```
// 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 recursively update 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;
}

```

## Java

```

// Java program to convert BST to binary tree such that sum of
// all greater keys is added to every key

class Node {

    int data;
    Node left, right;

    Node(int d) {
        data = d;
        left = right = null;
    }
}

class Sum {

```

```

int sum = 0;
}

class BinaryTree {

    static Node root;
    Sum summ = new Sum();

    // A recursive function that traverses the given BST in reverse inorder and
    // for every key, adds all greater keys to it
    void addGreaterUtil(Node node, Sum sum_ptr) {

        // Base Case
        if (node == null) {
            return;
        }

        // Recur for right subtree first so that sum of all greater
        // nodes is stored at sum_ptr
        addGreaterUtil(node.right, sum_ptr);

        // Update the value at sum_ptr
        sum_ptr.sum = sum_ptr.sum + node.data;

        // Update key of this node
        node.data = sum_ptr.sum;

        // Recur for left subtree so that the updated sum is added
        // to smaller nodes
        addGreaterUtil(node.left, sum_ptr);
    }

    // A wrapper over addGreaterUtil(). It initializes sum and calls
    // addGreaterUtil() to recursive update and use value of sum
    Node addGreater(Node node) {
        addGreaterUtil(node, summ);
        return node;
    }

    // A utility function to print inorder traversal of Binary Tree
    void printInorder(Node node) {
        if (node == null) {
            return;
        }
        printInorder(node.left);
        System.out.print(node.data + " ");
        printInorder(node.right);
    }

    // Driver program to test the above functions
    public static void main(String[] args) {
        BinaryTree tree = new BinaryTree();
        tree.root = new Node(5);
        tree.root.left = new Node(2);
        tree.root.right = new Node(13);

        System.out.println("Inorder traversal of given tree ");
        tree.printInorder(root);
        Node node = tree.addGreater(root);
        System.out.println("");
        System.out.println("Inorder traversal of modified tree ");
        tree.printInorder(node);
    }
}

// This code has been contributed by Mayank Jaiswal

```

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

## GATE CS Corner Company Wise Coding Practice

Binary Search Tree  
Amazon  
BST

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.

## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Amazon Interview Experience

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## **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 modified 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 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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### 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  $p \cdot q \leq n$ , 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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### 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 than 3 unique pages should be in the contact list.

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

---

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### 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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## 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

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### 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  $\text{Sum}(\text{Left array}) = \text{Sum}(\text{right Array})$ .

Did it  $O(n)$  time complexity 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(`emplId`, `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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### Amazon Interview | Set 9 (Answers)

This post is about answers to the questions asked in [Amazon Interview | Set 9](#). 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 faster.

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

- 1) I tried for some time. Then the interviewer gave me the formula. The number is  $1 + \text{ceil}((N-W)/S)$  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.

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### 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.

```
static int LargeBST(Node root, int N) { }
```

Given that

```
class Node
{
    Node left, right;
    int data;
    Node(int newData)
    {
        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

op: 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 0 0 0 0 1

0 0 1 1 1 1

0 0 0 1 1 1

The answer is 2<sup>nd</sup> 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", "abxyz", "ratcatabc", "xyzcatratabc"

Answer: "xyzcatratabc"

"abxyz" 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
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## 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 swapped..

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 pythagorean 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  $O(n \log n)$  [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 ( $Y_1 - X_1$ ), ( $Y_2 - X_2$ ) ..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  $\text{denominator} * \text{quotient} + \text{remainder} = \text{numerator}$ .

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  $|\text{denominator}| * \text{quotient} + \text{remainder} = |\text{numerator}|$

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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### 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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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### 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 methods. 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  
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](#)

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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## 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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## 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.

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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  $O(n \log n)$ . 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.

**HIRE!!**

This article is compiled by **Jinendra Baid**. Many Many congratulations to Jinendra 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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## 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.

**HIRE!!**

### **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 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.

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

**We strongly recommend that you click here and practice it, before moving on to the solution.**

Source: Amazon Interview Question

## 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 5**

Time Complexity:  $O(n \log n)$

### 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  $n - (1 \oplus 0 \oplus 0 \oplus 0 \oplus 1 \oplus 0 \oplus 1 \oplus 0 \oplus 1 \oplus 1 \oplus 1 \oplus 0)$

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  $2^2 \cdot 2^{(2-1)} = 4$ . 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 and IC for suggesting this solution.

See [this](#) 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

## GATE CS Corner Company Wise Coding Practice

# Microsoft Interview Experience | Set 111 (For 1.5 Years Experienced)

Position: Software Engineer – 2(Big Data Team, Bangalore)

I applied through referral. Got a call within a week.

## Round-1(Skype-Bangalore)(~45Mins)

The interviewer directly asked me to explain about my current project. 5-6 questions from there.

My project was based on cloud computing so, He asked me some basic questions about cloud computing. About three layers(IAAS, PAAS, SAAS), etc..

The difference between CloudStack and OpenStack(CloudStack(CS), The product I am working on).

OpenStack is a similar product. Scenarios where CS is used (how customers are benefited from CS).

Then, He moved to Algorithm section. How will you differentiate the questions from google code jam and facebook hacker cup(As I participated in both competitions)

He asked me to give him a problem. I told, To find the longest palindromic substring in a string of characters.

Then, he asked me the solution, Gave Manacher's algorithm. Asked the algorithm details(Interviewer) and time, space complexity.

## Round-2(F2F-Bangalore)(~1Hour 15Mins)

The interviewer started with my Introduction. He then scanned my entire CV, all projects, even covered my school projects, etc..

The difference between Java and C++. Advantages and disadvantages of each.

Which language you are most comfortable with. Rate yourself out of 5.

After that he asked, how the run time polymorphism works in C++. How C++ resolves it. I explained about

Virtual stuffs and associated VPTR and VTABLE.

Then, He asked details of my last project. Some here and there questions from the project.

He moved to algorithm section.

Q-1: Given MxN binary matrix, find the largest sub-square matrix with all 1's.

I came up with a DP solution. He asked me to explain the algo first then told me to write code on paper. I left some validation cases, so he asked to handle those, then asked me about time, space complexity and to write all test cases.

Q-2: Find the row which contains most number of 1's in a MxN binary matrix, Where in each row 0's are always followed by 1's. Gave him the binary search algorithm, but he asked me to optimize further. Then, I came up with the stepping linear time algorithm with O(M+N). (Same, asked to write code on paper then test cases). Time and space complexity.

## Round-3(F2F-Bangalore)(~1Hour)

The interviewer started with my Introduction. It was kind of Design round.

He asked me to design your own BitSet API. All the methods like flip, set, reset, countOnes, etc..

What data structure will you use. He then, put a constraint like what if multiple threads access the methods. I gave solution to use mutex lock. He asked me the difference between semaphore and mutex, and how to handle deadlock situation. I told about maintaining locks in 2-phase. (Growing and shrinking phase). Then asked the implementation details. Wrote all codes on paper. Testcases and time, space complexities of each operation.

## Round-4(F2F-Bangalore)(~1Hour)

Introduction. Why Microsoft, Why do you want to leave, Asked details of my last project.

He then asked me to design LRU cache on white board. Asked to write code for searching a key on LRU. As usual, Time, space complexity and Testcases.

Algo Question:

Check if given binary tree is binary search tree? How to handle the multiple thread case?

Some discussion on that. Wrote code on white board, testcases and asked time, space complexity.

## Round-5(F2F-Bangalore)(~45Mins)

Introduction, Asked about the product. Asked to draw the architecture of the product. Some discussion of each component of the architecture. What you explored outside of your current work. I talked about docker container. Some discussion on that. Explained about their work in detail. What is expected from the position, etc...

## Round-6(Skype-Redmond)(~45Mins)

It started with my Introduction. The interviewer asked the detail of my current project.

What was the duration of the project, and how many members involved?

How many programming languages used? How many programming languages do you know?

Which one are you most comfortable with? Rate out of 5.

He then asked me the difference between class and structure in C++. How to implement an interface in C++. etc..

Algo Question:

Given two linked lists sorted in ascending order, merge them into one linked list(Maintain Sorting). Do it in place. He asked me to write in a text editor, shared my screen. Asked me to listout all test cases, and time, space complexity.

## Round-7(Skype-Redmond)(~45Mins)

Introduction. Asked me the project details. Some discussion on that.

Algo Question:

Sort 1 billion integers with limited memory. I told about sorting them chunk by chunk and then

merging. He then asked me how to decide the chunk size. I explained with an example. Asked about time complexity. Then, Asked whether this will take the same amount of time if we have infinite memory. I told about the access time difference in primary memory and secondary memory. Asked details about secondary memory, About disk technology, sector, seek time, rotational delay, etc..

#### Round-8(F2F-Bangalore)(~45Mins)

Again started with my Introduction. He asked my project details. He was the engineering director of the team.

#### Algo Question:

Find median of an infinite stream of integers with limited memory. I came up with a solution where we have infinite memory. I started with insertion sort and then optimized to min-heap and max-heap method. But he was more interested in limited memory algorithm. I tried hard, but couldn't come up with one. He told me to write code for my solution on white board. As usual asked to write test cases, time and space complexity.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 110 (Internship)

### Round 1

It was an online coding round conducted on cocubes.com. It was a 75 minutes round consisting of 3 coding questions only.

Questions were:

- 1: An array of integers is given which represents the heights of n buildings. Sun start falling from the left side. If there is a building of certain Height, all the buildings right of it having lesser heights cannot see the sun. Find the no. of buildings which can see the sun.
- 2: Rearrange a given array in-place such that all the negative numbers occurs before positive numbers. (Maintain the order of all -ve and +ve numbers as given in the original array)
- 3: [Find the sum of leaf nodes at minimum depth of a tree](#). Return -1 if root is NULL.

Students doing all the questions correctly and some students doing 2 questions correctly cleared this round. Total 16 students out of around 150 were selected for further rounds which were conducted at NSIT Delhi.

### Round 2: Group Fly Round

In this round only 1 question was given and 30 minutes was the allotted time. It was a paper based coding round.

**Ques:** Write a string comparison function. (Return 0 -if strings are equal, 1 -if string 1 is greater else -1). The increasing order of priority of characters was given: a,b,c,d,e,k,f,g,h,i,j,l,m,n,'ng',o,p,q,r,s,t,u,v,w,x,y,z ('ng' combination has to be considered as a single character).

According to me, in this round apart from writing correct & working code one should try to communicate with the mentor a lot and make him understand your code. From a group of 12 students, 6 were selected for further rounds.

### Round 3: Technical Interview

Firstly there was a 15 min discussion on my project. He asked me about the project details like implementation, technologies used and time spent on the project etc. Then he gave me only one coding question-

**Ques – Given k sorted arrays. Merge them into a single sorted array.**

I directly gave him the min. heap solution so he asked me about other methods also. Then he asked me to derive the time and space complexity for the min. heap solution. Then he told me to write code for the same.

The interviewer was not at all cooperative. He kept asking questions when I was writing the code.

### Round 4: Technical Interview

The interviewer was cool and asked me some direct questions after the discussion about my project.

**Ques 1:** Find intersection point of 2 linked list.

**Ques 2:** Detection of loop in a linked list.

He asked me to write the code of the above 2 questions. He told me that the evaluation of the code would be according to the code correctness, proper indentation, time taken etc.

Then he asked me about the knapsack problem(fractional as well as 0-1)and some graph related problem. I told him that I was not comfortable in writing graph codes so he asked only the implementation of these problems.

### Round 5: Technical Interview

It was meant to be an HR interview but the interviewer asked me some technical questions also. Firstly she asked me about the project and then some basic HR questions and then gave me 2 coding questions and told me to code them.(correctly and neatly)

**Ques 1:** Given pre-order and in-order traversal of a BST. Construct the BST.

**Ques 2:** Given a string. Encode it.

Ex: input = wwwwwwaaabccccc

Output = w4a3bc3d2

I gave her the best solutions for both the questions.

Then she asked if I have any questions for them, so I did asked some questions.

Thanks to GeeksForGeeks for providing such a vast content to study and practice.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 109 (2 years experienced)

#### Round 1 (Telephonic)

- 1) What is LRU. How to Implement it.
- 2) Find kth smallest element in an array.
- 3) In a file, there are two columns, first column has some word (String) and 2nd column has some value (Double).

Example :-

ABC 23.4

ERF 34.89

WERT 122.9

Now user wants some arithmetic operations like

- 1) ABC + ERF = 23.4 + 34.89 = 58.29
- 2) ABC – WERT = 23.4 – 122.9 = -99.5

Design an efficient DS for these kind of operations.

#### Round 2 (F2F)

- 1) Asked about current Project.
- 2) Given a string str. You have to make this string to square string with maximum length. A square string is of the following format:  
 $\text{str} = \text{x} + \text{x}$ ; where x is any string. Return length of this square string.

Example

str = ababa

Max length square string = 4;

str = abcd

Max length square string = 1;

#### Round 3 (F2F)

- 1) Asked about current project. Asked to draw architecture of my project. Then Asked to design a new feature that is currently not there in my project.
- 2) Design undo and redo operation in Microsoft Word like text editor.
- 3) Design Hit Counter. ([Design Hit Counter](#))

#### Round 4 (F2F)

- 1) Asked about current project.
- 2) You are given a text file. You have to return the list of starting index of the given word in text file. Design an efficient DS for that.

Example :-

Text file content : "geeks for geeks"

word : "geeks"

List : {0,10}

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Microsoft

### Microsoft Interview experience | Set 108 (On-Campus)

#### Round 1: Aptitude

#### Round 2: 2 questions from data structure

#### Round 3: Group fly round

Find the least common ancestor of two nodes in a binary tree

Determine if the current root value matches one of the key values. If so, this root is returned. Else the procedure is recurred for left and right subtrees. The node which has one key in left subtree and the other key in its right subtree is the LCA. If both keys lie in left subtree, the first node whose value matches one of the key values is LCA. Similarly for right subtree. Time complexity is O(n). The interviewer asked for optimization. I suggested a better approach for BST.

Given two sorted arrays (with repetitive elements) find the kth minimum number from both arrays

Maintain an index for each array, both initialized to the first element of their respective array. Loop k times and in each iteration find the minimum element among the current indices and increment the index of the array containing the minimum. If the elements are equal, increment both indices. Time complexity is O(k).

#### Round 4:

Given a node in a BST, delete it. Parent link is not a part of the node structure.

If the node is a leaf node, delete the node.  
If the node has one child replace the value of the node with the child's value and recursively delete the child.  
If the node has two children, find the inorder successor, replace the current node's value with the inorder successor's value and recursively delete the inorder successor.  
Time complexity is O(h). Interviewer suggested a possible optimization for one child case, that recursive deletion is not needed for one child. We only have to copy its left and right child pointers to the node which we are trying to delete.

Puzzle – there are nine coins, out of which one is defective (differing in weight from the others). Find the maximum number of iterations to find the defective one.

I suggested a divide and conquer approach, with maximum of 5 iterations.

#### Round 5:

Discussion of project

A program is running in an infinite loop in the system. If we try to run another good program while this infinite loop is executing, will the good program run?

I answered that the program will run, but the CPU utilization will be reduced.

Write a code to implement the strtok() function in C.

Maintain an index to represent start of next token, initialized to 0. Search the string linearly, if a match for the pattern is found, store the substring from the start index to the previous position of the pattern in a string array and update the start index for next token. Time complexity is O(n).

Interviewer wanted to know why I had used malloc() instead of static allocation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview experience | Set 107 (On-Campus for Internship)

### Round 1: Coding

Q.1 A 5\*5 matrix of spiral order is

25	24	23	22	21
10	9	8	7	20
11	2	1	6	19
12	3	4	5	18
13	14	15	16	17

Now for an N\*N spiral matrix filled similar to one given above, find element present at [R,C] position where R=row's number, C=column's number.

Constraint: You can't create matrix itself. Print number without creating matrix explicitly.

Q2. Given a string S and two indexes i & j, modify the string in a pattern such that:

characters from [0 to i] index are now at back of the string.

characters from [j till end of string] are in front of string.

e.g. S = "abcdef" and i=1, j=3.

Output should be: "defcab"

Constraint: Constant Space.

Q3. <https://leetcode.com/problems/simplify-path/>

### Round 2: Group Flyer

Q1. Given an array of positive integers, sort the array in a manner such that when all the elements of new array are concatenated in a string, the number formed is maximum.

e.g. input: [12,9,32]

output: [32,9,12]

Q2. In a native language alphabets are in this order:

a b d c k l g h n g q r

given two string str1 and str2, find which one is larger among the 2. (larger means rankwise more e.g. if "da" and "c" are given then "da" > "c" as d comes first).

write this function:

```
bool compare(char* str1, char* str2);
return 1, if str1 > str2.
return -1, if str2 > str1
return 0, otherwise
```

Interviews: We needed to write our code on a paper.

### First F2F round:

Q. <https://leetcode.com/problems/letter-combinations-of-a-phone-number/>

I did it using recursion and then he asked me to think about iterative approach. One que of DBMS, I told him I am from ECE and haven't studied DBMS. Then he asked what courses I have done from CSE dept. I told him OOP, DS, Architecture, Network.

Finally he asked if I have any questions. I asked about diff b/w MSIDC and MSIT.

Second F2F Round:

Q1. <http://www.geeksforgeeks.org/find-longest-path-directed-acyclic-graph/>

He gave me this que and asked to solve it in 45 minutes. First he asked about approach. I told him the approach and procedure how I am going to code it.

Then he changed the question I don't know why and next ques was:

Q2. In a degree 'N' tree. Find LCA of 2 given nodes. All elements are unique in tree.

First I gave him a general solution. He didn't seem convinced because of space complexity and told me to think more. I answered approach in which we can store path from root node to given nodes and match the path. He was convinced then and told me to wait for 5 minutes before 3rd round.

### 3rd F2F Round:

He asked me about myself. Then he asked what part I like most in DS. I said trees, linked list.

Q1. Given 2 numbers 'N' and 'M' where 'N' > 'M' and last a range of indexes [i,j] between (1,32) which denotes indexes in binary representation of 'N', change all the bits in this range to bits of number 'M'. Also (j-i) is equal to most significant bit of 'M'

e.g. N=9 :: (binary) 000000...0001001

and M=2 :: (binary) 000000...00000010

and (i=1,j=2) implies 1 to 2 bits of N has to be changed such that they are equal to M's bits.

expected output: 10 :: (binary) 000000...0001010

where (...) = 19 zeros

First I didn't get it but then he explained with above example.

Answered it in O(32) in second go.

Q2. Populate next pointer in a binary tree in O(1) space.

<http://www.geeksforgeeks.org/connect-nodes-at-same-level-with-o1-extra-space/>

Q3. Something about Deadlock. I asked about the subject and He said OS. I told him I haven't studied this. He calmly said "Ohh Okay no problem" ☺

Finally someone from their team told me "We are done for the day, You can leave" ☺

Total 11 students were selected.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Microsoft

## Microsoft Interview experience | Set 106

### 1. Phone Interview

- Tell me about yourself
- Questions related to kernels(difference between linux OS/kernel and windows OS/kernel)
- Difference between Process and thread

```
//32 bit architecture
bool isPowerOfTwo(int no)
{
    int i = 1;
    int state = 0;
    int k = 0;

    for (int j = 0; j < 32; j++)
        if ((no & (1 << j)) != 0)
            state |= (1 << k);
            k++;
}
```

### 2. F2F

- How many storage types are there in C.
- How many data types are there in C.
- Given a file with many strings. Find how many unique anagrams exists. (Hash table, BST and finally TRIE approach).
- How will you handle large data in a distributed way for the above question.
- How will you handle large data in one reducer.
- What are the properties of distributed systems.

### 3. F2F

- Implement map reduce program very similar to word count.
- How will you handle large data in one reducer.
- How will you distribute data across cluster and data centers.
- Internals of hadoop.(saving of intermediate files after map phase)

### 4. F2F

- Compress a string "aaabbcd" to "a3b2c1d4"
- What this program actually does internally

```
void fun() {
```

```
int a = 5;
int * b = new int(10);

}
```

- What is the effect of this program to multiple threads.
- Design distributed file system.

#### 5. Leadership round

- Why you want to change?
- Discussions around azure business model, revenue model, details of job profile, etc.
- Given binary tree's root and a node, find all the ancestors of the node.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview experience | Set 105 ( Global Delivery )

**Online-screening test:** It was of around 90 minutes and was divided in 3 individual tests as follows:

- **1st test:** Non-technical mcq(40 minutes: 40 questions)

Quantitative aptitude mcq including questions on percentages, ratios, speed/distance, ages, pie charts, probability etc. Questions on vocabulary, coding/decoding, round table arrangements, sentence correction, Statements and conclusion etc. were also present. Questions were easy but lengthy. I solved around 70% of them.

- **2nd test:** Technical mcq (30 minutes: 30 questions)

Questions were from dbms, c, data structures (mainly binary trees), OS and Networking. Questions like whether relational calculus is procedural or non-procedural language, tell no of leaves if no of internal nodes is given in binary tree etc. Practice them from GeeksQuiz.

- **3rd test:** Essay writing test (20 minutes: one essay 250-300 words)

Need to write essay on the topic : 'Is social media a right platform to discuss political issues' Topic was not same for all. Others got topic like: "Cricket is declining other sports", "Internet is everything" etc.

After this online test, they shortlisted 36 out of more than 100 students.

Then there were 3 rounds of interviews; every round was elimination round.

### Round 1: Technical interview (70 -80 min)

Interviewer asked favorite subjects apart from data structures and algorithms. I told him dbms and oops.

1. Define joins in SQL and explain them. I explained him inner, left, right and outer join. Then he asked me about axis join.
2. Define keys. Surrogate keys, primary keys, foreign keys, candidate keys and super keys. Then he named around 4 more keys which I didn't know.
3. What is encapsulation? Explain with example. How is it useful?
4. If one class B is inheriting a class A which has a private function, what keyword will you append in function definition to use that in class B? I said by making that function friend. Some more follow up questions on it.
5. Convert binary tree to doubly linked list (<http://www.geeksforgeeks.org/in-place-convert-a-given-binary-tree-to-doubly-linked-list/>)
6. Longest incremental subsequence (<http://www.geeksforgeeks.org/dynamic-programming-set-3-longest-increasing-subsequence/>)
7. Swap two numbers without using temp variable: Asked 3 approaches (<http://www.geeksforgeeks.org/swap-two-numbers-without-using-temporary-variable/>)
8. Check linked list is palindrome or not(<http://www.geeksforgeeks.org/function-to-check-if-a-singly-linked-list-is-palindrome/>)
9. In-place rotate n\*n matrix to 90 degrees ( <http://www.geeksforgeeks.org/inplace-rotate-square-matrix-by-90-degrees/>)
10. Find two rectangles overlap (<http://www.geeksforgeeks.org/find-two-rectangles-overlap/> )
11. Print 1 to 100 without using recursion and loops. Give generic solution
12. Test cases for water bottle. And some more questions on strings and software testing which I am not able to recall.

### 2nd round Tech + HR: (50- 60 min)

Basic HR questions. Where do you see yourself in 5 yrs, why do u want to join Microsoft etc. Print all prime nos from 1 to 100. Design elevator algorithm which responds in least possible time. SQL query to find nth highest salary of an employee. Explain IOT in layman terms, cryptography, software testing methods, how do you handle stress, strategy to study the tough subject, what if we do not select you etc. Discussion on my projects.

### 3rd round: HR (60 – 65 min)

Tell me about yourself, discussion on my projects, why I used a particular technology in project, what other technology I could choose, asked almost everything from the resume, priorities in life, why Microsoft, what people say about you: positives, negatives and how you are working on it, what if we don't select you etc. Interviewer was awesome and it was fun talking to him.

My whole experience was amazing. Study DBMS, SQL and data structures thoroughly. Also do give a look at puzzles. If you do not know anything, say no simply. Be confident.

**I would like to thanks GeeksforGeeks.org and GeeksQuiz a lot for wonderful collection.**

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview experience | Set 104 (On Campus for IDC)

Microsoft (IDC) had come to my campus to recruit FTEs and summer interns. The selection procedure involved an online coding round, Group-fly round and 2-3 interviews.

#### Round 1 (Online coding round):

This round was the online coding round in the co-cubes portal. There were three questions carrying 25marks (5+10+10) of total. 1 hr and 30 mins were given for this round.

- i) Given the numbers n and k, change the k th bit of the number n to '0' if it is '1', else return the number n itself

Example:

For n=13 (1101) & k=2, return 13

For n=13 (1101) & k=3, return 9 (1001)

- ii) Return the sum of two binary numbers represented as strings

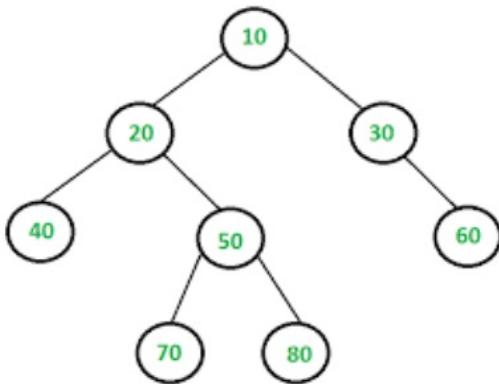
Example:

For n1=111 & n2=10011, return 11010

<http://www.geeksforgeeks.org/add-two-bit-strings/>

- iii) Return the sum of all the leaf nodes at minimum level in a binary tree. If there exists no tree, then return -1

Example:



For the above binary tree, return 100 (40+60)

After the first round, 5 of them were selected for the interviews directly and around 12 of them were selected for the group fly round. As all the questions were quite easy, the selection was based on the efficiency of the code.

#### Round 2 (Group-fly round):

Given a number n, print the number in words.

Example: For n=125, print One hundred and twenty five.

Technical Interview 1:  
1. I was asked the same question as in the group fly round. (As I was selected directly to the interview, my interview happened at the same time the group fly round was going on)

First the approach was discussed and after the interviewer was satisfied with my approach, I was asked to write the code for the same.

He then asked me to write down the test cases for the same problem. I came up with all the possible test cases. I then realised that I had not written a code to include all these test cases and asked the interviewer if I had to correct my code, for which he said it was not required.

2. There's a system that takes a stream of numbers. When each new number arrives, find the median of the set of numbers that we have so far. I gave a solution using AVL trees and wrote the code for the same. I was also asked to evaluate my solution.

#### Technical Interview 2:

1. Given a BST and a number n, find two numbers in the tree that sums up to n. This was to be done in place i.e. without any extra space.

I came up with a brute-force solution and two more solutions using extra-space. I was asked to write the code for one of them.

2. In facebook, given a person p, find the number of connections till the kth level. The friends of p form the 1 st level, friends of friends of p the 2 nd level and so on. The data structure and the algorithm to be used were discussed and code was to be written for my approach.

#### Last interview:

This one was called as the AA(As-Appropriate) round in which the interviewer looks for uniqueness, technical knowledge and soft-skills too.

1. The whole interview was about the mini-project I had mentioned in my resume. A deep discussion on other approaches and about storage that would make the search efficient was done.

2. General HR questions like 'Why Microsoft?' were asked.

Finally 2 of them were selected. In all the interviews, rather than the correct solution, the approach and uniqueness of the solution was weighed more.

I thank geeksforgeeks.org for providing a great support for my placement preparations.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview experience | Set 103 (On Campus for IDC)

Microsoft came to our campus to recruit FTEs for MS-IDC. The selection procedure involved a total of 5 rounds, at the end of which 5 candidates were selected.

#### Round 1 – Online Coding Round

The first round consisted of 3 coding questions on Cocubes with a time limit of 75 minutes. Only the function body had to be coded.

- Given an array of n numbers, replace each element with it's farthest coprime in the range [2, 250]. Example, the farthest coprime for 2 is 249 and for 243 is 2.
- Given a number n, return the factorial of the number as a string. (The number was passed as an integer parameter and the string had to be returned.)
- Given two trees, tree A and tree B, return the size of the subtree if B is a subtree of A. Otherwise, return zero.

<http://www.geeksforgeeks.org/check-if-a-binary-tree-is-subtree-of-another-binary-tree/>

#### Round 2 – Group fly

This was a written round with 2 questions.

- Given a sorted integer array and a number X, find the number of unique pairs in the array that sum up to X.

<http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/> (similar)

Request format: "GET"

Response format: "DATA "

Give test cases for the above request-response query.

Example, a base case could be fetching data from a file on the server and comparing the data with the local copy of the same file.

#### Technical Interview – 3 rounds

My first round was a design round. I was given 3 scenarios.

- Design a personal assistant like Cortana for your B.tech courses.
- Given the heights and states of all the students in your college, what kind of analysis and grouping will you perform on the available data?
- Consider a client-router-server network. Clients request for information from the server via the router. Every server has a backup in case it fails. How will you ensure data consistency after using the backup server when the main server fails?

#### My second round had 2 coding questions

- Given a binary tree, print it's level order traversal with each level on a different line. Every line had to be prefixed with "Level: (level number)".

<http://quiz.geeksforgeeks.org/print-level-order-traversal-line-line/>

- Given the root and two nodes of a binary tree, find the Least Common Ancestor (LCA) of the given nodes. How will you modify the approach if every node has a parent pointer.

<http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>

#### Last Round

The last round had a very simple question. Given a string, report if the string contains all unique characters or not. We were asked to write industry level code and provide test cases as well.

I would like to thank [geeksforgeeks.org](http://geeksforgeeks.org) for providing such exceptional placement support. I did all my preparation from the website alone.

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.

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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview experience | Set 102 (On Campus for IDC)

Around 150 students appeared for the test.

#### Round 1 (75 minutes):

Online coding round hosted on HackerRank . Three coding questions were asked.

1. Given a Linked List of integers, write a function to modify the linked list in-place such that all odd numbers appear before all the even numbers in the modified linked list. The relative order of even and odd numbers should remain the same. – <http://www.geeksforgeeks.org/segregate-even-and-odd-elements-in-a-linked-list/>

- Given a floating point number, calculate its square root without using in-built sqrt() function.
- Given a pattern string and a test string, implement RegEx substring matching. If the pattern is preceded by a ^, it will match with the starting position. Similarly, if it is preceded by a \$, it will match the ending position. If no such markers are present, it will check whether pattern is a substring of test.

```
Ex : coal
coaltar
Result : True
tar$
coaltar
Result : True
abcd
efgh
Result : False
```

25 students were selected for the next round.

#### Round 2(paper coding round):

- Print boundary traversal of Binary tree in clockwise direction.(Note: check for leaf nodes in left and right traversal for a given tree). – <http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>
- Rotate a square image 90 degree clockwise. Optimize as much as u can. Similar Question: <http://www.geeksforgeeks.org/inplace-rotate-square-matrix-by-90-degrees/>

8 students were selected for further rounds.

#### Round 3 – Personal Interview 1

- Discussed about the 1st question asked in paper coding round, i.e., Boundary traversal of Binary tree.
  - How to **merge two BSTs** . Asked me all the approaches that I was able to implement . Then asked me to do in O(logn), where n is total no. of nodes .
  - Asked me to write code to find a no. occurring greater than n/2 times in an array . Then asked me to prove the written algorithm , basically , he was asking how I was able to write that code and why is it working .
- 7 students were selected for further rounds.

#### Round 4- Personal Interview 2

- Asked me to implement seat booking process in BOOKMYSHOW.com . How to handle the cases where two persons are trying to access the same seat at almost same time . He told me to write class based solution asking about different functions that should be used to solve all the cases for booking procedure .
- What is **singleton class**?
- How to **find the point of intersection of two line segments** . Two end points of line segments were given.
- How to find no. of 2's between nos. 1 to n . He gave me few hints and finally , he was satisfied with my approach
- Implement fibonacci series considering every possible solution .

And few more questions were asked , but I don't remember them. 6 students were selected for further rounds.

#### Round 5- Personal Interview 3

- Write function for **inorder traversal of Binary tree without recursion**. That was easy !!
- Asked me a puzzle question. An n\*n board is given and one of the given cells is black .Also , L shaped pieces are given (equivalent to 3 cells of given matrix) , considering all possible rotations. I had to fill the entire grid using those pieces . Pieces can't be placed on the black cell and no two pieces should overlap , not even partially . I gave an answer where I tried to increase the size of unaccesiblecells( black cells and already placed pieces on board) to the size of the given board , but he asked me few cases where my answer failed. Then I said him we can do the exhaustive search of combinations using backtracking but it will take too much time . Then he gave me clue that instead of growing the size of unaccesible cells, try to decrease it. Finally , I concluded that it divide-n-conquer based solution considering base case as 2\*2 board with 1 black cell.

4 students were selected for further rounds.

#### Round 6- Personal Interview 4

He told me to implement **LRU Cache** . I gave him all the solutions that can be possible . He was very helpful . He found flaws and told me to optimize it. I gave him 3 solutions and the final one is the one which you can find anywhere on the internet. But before that , he asked me to swap two nodes of a DLL using hashmap . I didn't know what Lru Cache is initially .haha

#### Round 7- Personal Interview 5

- What's your passion ? What you want to do in your life ? Hr-type question .
- He designed a new language with the words of English and stored them in an array of strings . Then he gave me two strings and told me to design strcmpfunction . I told him the best method in one go , but he tried to confuse me and he was successful . He gave me 5 mins to come up with another solution and tried new one .Lastly , I implemented the first approach I had in mind and he was satisfied with it.
- How to **serialize and deserialize an n-ary tree** . I told him the function for serializing and deserializing a binary tree but couldn't come up with solution for the given problem.

3 students were finally selected for MS-IDC. I was one of them. :p

P.S : I was not comfortable with OS and DBMS , so I told them clearly but they tried to ask indirectly all the basic questions of OS and DBMS , and told me to implement them using C/C++.

#### Questions asked to my friends :

- Developing an algorithm for crossing bridges problem , where no. of elements is n.
- **Intersection of two linked lists**.
- Find if **loop is present in linked list** and also ,find the start node of the loop in it .
- Class design for banking system.

- Reverse linked list using both recursion and iteration etc etc

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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview experience | Set 101 (On Campus for IDC)

Recently , Microsoft visited our campus for recruiting FTE for MS-IDC division.

Around 150 students appeared for the test.

#### Round 1(75 minutes):

Online coding round hosted on HackerRank . Three coding questions were asked.

Q1 : Given a Linked List of integers, write a function to modify the linked list in-place such that all odd numbers appear before all the even numbers in the modified linked list. The relative order of even and odd numbers should remain the same. <http://www.geeksforgeeks.org/segregate-even-and-odd-elements-in-a-linked-list/>

Q2 : Given a floating point number, calculate its square root without using in-built sqrt() function.

Q3 : Given a pattern string and a test string, implement RegEx substring matching. If the pattern is preceded by a ^, it will match with the starting position. Similarly, if it is preceded by a \$, it will match the ending position. If no such markers are present, it will check whether pattern is a substring of test.

Ex : ^coal

coaltar

Result : True

tar\$

coaltar

Result : True

abcd

e f g h

Result : False

25 students were selected for the next round.

#### Round 2(paper coding round):

Q1 : Print boundary traversal of Binary tree in clockwise direction.(Note: check for leaf nodes in left and right traversal for a given tree).

Q1 : Rotate a square image 90 degree clockwise. Optimize as much as u can.

8 students were selected for further rounds.

#### Round 3 – PI1

Q1 : Discussed about the 1st question asked in paper coding round, i.e., Boundary traversal of Binary tree.

Q2 : How to merge two BSTs . Asked me all the approaches that I was able to implement . Then asked me to do in O(logn), where n is total no. of nodes .

Q3 : Asked me to write code to find a no. occurring greater than  $n/2$  times in an array . Then asked me to prove the written algorithm , basically , he was asking how I was able to write that code and why is it working .

7 students were selected for further rounds.

#### Round 4-PI2

Q1 : Asked me to implement seat booking process in BOOKMYSHOW.com . How to handle the cases where two persons are trying to access the same seat at almost same time . He told me to write class based solution asking about different functions that should be used to solve all the cases for booking procedure .

Q2 : What is singleton class?

Q3 : How to find the point of intersection of two line segments . Two end points of line segments were given.

Q4 : How to find no. of 2's between nos. 1 to n . He gave me few hints and finally , he was satisfied with my approach .

Q5 : he asked me to implement fibonacci series considering every possible solution .

And few more questions were asked , but I don't remember them.

6 students were selected for further rounds.

#### Round 5:PI3

Q1 : Write function for inorder traversal of Binary tree without recursion. That was easy !!

Q2 : Asked me a puzzle question. An  $n \times n$  board is given and one of the given cells is black . Also , L shaped pieces are given (equivalent to 3 cells of given matrix) , considering all possible rotations. I had to fill the entire grid using those pieces . Pieces can't be placed on the black cell and no two pieces should overlap , not even partially . I gave an answer where I tried to increase the size of unaccesible cells( black cells and already placed pieces on board) to the size of the given board , but he asked me few cases where my answer failed. Then I said him we can do the exhaustive search of combinations using backtracking but it will take too much time . Then he gave me clue that instead of growing the size of unaccesible cells, try to decrease it. Finally , I concluded that it divide-n-conquer based solution considering base case as  $2 \times 2$  board with 1 black cell.

4 students were selected for further rounds.

#### Round 6 : PI4

Q1 : he told me to implement LRU Cache . I gave him all the solutions that can be possible . He was very helpful . He found flaws and told me to optimize it. I gave him 3 solutions and the final one is the one which you can find anywhere on the internet. But before that , he asked me to swap two nodes of a DLL using hashmap . I didn't know what Lru Cache is initially . haha

#### Round 7 : PI5 and final round

Q1 : What's your passion ? What you want to do in your life ? Hr-type question .

Q2 : He designed a new language with the words of English and stored them in an array of strings . Then he gave me two strings and told me to design strcmp function . I told him the best method in one go , but he tried to confuse me and he was successful . He gave me 5 mins to come up with another solution and tried new one . Lastly , I implemented the first approach I had in mind and he was satisfied with it.

Q3 : How to serialize and deserialize an n-ary tree . I told him the function for serializing and deserializing a binary tree but couldn't come up with solution for the given problem.

P.S : I was not comfortable with OS and DBMS , so I told them clearly but they tried to ask indirectly all the basic questions of OS and DBMS , and told me to implement them using C/C++.

#### Questions asked to my friends :

Developing an algorithm for crossing bridges problem , where no. of elements is n.

Intersection of two linked lists.

Find if loop is present in linked list and also , find the start node of the loop in it .

Class design for banking system.

Reverse linked list using both recursion and iteration .

And many more.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview experience | Set 100 (On Campus for Internship on IDC and IT)

Microsoft Visited our campus for Internship selections on IDC and IT profile. There were three rounds for the selection process of IDC profile

#### First Round :Coding round

3 Questions were asked in different sets . Out of which people who solved 2 and more are shortlisted . People who solved 3 were shortlisted for Personal Interview , while the one's who solved 2 were shortlisted for Group fly round.

#### Questions were :

1. You will be given buildings of certain height that lie adjacent to each other . Sun starts falling from left side. If there is a building of certain Height, all the buildings right of it having lesser heights cannot see the sun . You need to find the total number of such buildings that receive sunlight .

Find the increasing subsequence (Not strictly ) with 1st building as the starting building.

2. You will be given two arrays of equal size and you need to maximize the first array with the second array elements ( swap the first array elements with second array elements . Once swapped , you cannot use the element anymore )

For ex: A: 3 4 6 8 9 and A : 5 7 3 6 8

B : 6 7 8 8 9 B : 3 4 6 9 10

Op: 9 8 8 9 Op : 10 9 6 6 8

Sort the second array and start swapping if the  $a[i] < b[i]$  . else wait for the next a's element which is less than  $b[i]$  and swap ( naive merge procedure )

3. You will be given two trees t1 and t2. You need to check if t2 is a subtree of t1. If it is a subtree ,you need to return the size of t2(number of nodes in it).

If either of t1 or t2 are NULL, return -1 .

If t2 is not a subtree of t1 , then also return -1

Most Efficient Solution was :

Any Tree has 2 unique traversals . ( Either it be (preorder,inorder),( in,post ),(post,pre) ) . So , Traverse them and store any two traversals for both the trees Check first traversal of both trees (String Matching using KMP O(N+M) ) and similarly for the second traversal.If they both come out to be true ( I mean pattern exists in text ) . Then you are done . Else return -1

This Complexity is O(N+M) and space O(N+M) . If you want to do without space , Try for the recursive approach which in worst case takes O(N\*M) complexity

Apparently , I was shortlisted for Personal Interview , so I didn't attend the Group Fly round.

#### Personal Interview rounds

##### 1st round(Technical ) :

Interviewer was bit cool and asked me questions directly

1. Find the median of an Unsorted array . I told him to sort it and find it as per the parity of N( even or odd ) . NLogN solution . He asked me to optimize it . Then I told him about the median of an unsorted array in worst case O(N) method ... (you can find it in gfg ).He asked me if I can do it using Quick select .. I told him the way to do so and suggested him that the worst case might shoot up to  $O(N^2)$  .He told me its fine and asked me to write the code. My code was bit tedious but I was able to get correct code finally .

2. Then he asked me regarding hashing (chaining and open addressing – Insertions ,deletions etc ) and c++ maps and their complexities

##### 2nd Round(Technical)

Interviewer was very cool and asked me questions regarding my project and I explained him briefly .Then he asked me coding questions .

1. You are given an unsorted array where any element can repeat any number of times. Elements ranges are > size . N is too high ( $10^7$ ) .So , I Gave him O(N)time and O(N)space hashing solution using unordered\_map solution . He was satisfied .
2. Next the question is to validate a date so that it is in the format expected and should be 20 years less than current date. You need to throw exception if it is invalid. First , I encountered all possible exceptions and after that I wrote an accepting method. He asked me to write code. This time I wrote a clean code covering all possible exceptions . He was satisfied. and told me that the motto of these technical rounds are to check if we can write correct codes and can grasp basics and analyse our strength in them.

### 3rd Round( HR round)

The manager was very very cool and asked me questions like . Why do you want to join microsoft? Why should we hire you and related stuff about me and he asked me to solve this question. [Find the majority Element](#) (element that repeats more than ( $N/2$ ) times in an array . If it doesn't exist , return -1. I told him the way to solve it in O(N) time and O(1) space using Moore's voting algorithm And after these rounds , I was given offer for the Internship for IDC profile.

Though I was selected for GolmanSachs Interview too , I had to take up this offer and I didn't sit for GS personal Interview.

**Thanks to GeeksforGeeks for helping me revise all the concepts and practice them with the help of [practice.geeksforgeeks.org](#) .** My Last 15 days before the Intern were completely spent solving problems and revising them in GeeksforGeeks.

A Big Thanks to the team!!

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

## GATE CS Corner Company Wise Coding Practice

Internship  
Microsoft

## Microsoft Interview experience | Set 99 (On Campus for IDC and IT)

Recently, Microsoft visited our campus for recruiting interns for their IDC and IT divisions.

### Round 1

It was an online coding round hosted on HackerRank. It was 75 minutes long and had three coding questions.

**Q1:** Given a Linked List of integers, write a function to modify the linked list in-place such that all odd numbers appear before all the even numbers in the modified linked list. The relative order of even and odd numbers should remain the same.

For Example:

```
Input: 1->8->2->10->5->4->7->6->NULL
Output: 1->5->7->8->2->10->4->6->NULL
```

Similar question: <http://www.geeksforgeeks.org/segregate-even-and-odd-elements-in-a-linked-list/>

**Q2:** Given a floating point number, calculate its square root without using in-built sqrt() function.

**Q3:** Given a pattern string and a test string, implement RegEx substring matching. If the pattern is preceded by a ^, it will match with the starting position. Similarly, if it is preceded by a \$, it will match the ending position. If no such markers are present, it will check whether pattern is a substring of test.

For Example:

```
^coal
coaltar
Result: True
$tar
coaltar
Result: True
abcd
efgh
Result: False
```

Around 50 people qualified for the next round. From a total of 40 test cases across the three problems, successfully passing 20 test cases ensured qualification. All three problems had tricky, hidden edge cases and very few candidates could pass all the test cases in even one problem.

**Round 2– Pen and Paper Round:** Two coding questions were given whose solution was to be submitted on pen and paper. A total of 45 minutes was allocated for this round:

**Q1:** Rotate a square image 90 degree clockwise

Similar Question: <http://www.geeksforgeeks.org/inplace-rotate-square-matrix-by-90-degrees/>

**Q2:** Given an array of integers and a target sum, write a function to check whether there exists a pair of integers whose sum equals the target. Use extra space to reduce the time complexity as much as possible.

A total of 17 students qualified from this round.

**Round 3- Personal Interview 1:** This was a technical round. There was a brief discussion on interests and project followed by two coding questions:

**Q1:** Write a function to reverse the order of the words in a string – <http://www.geeksforgeeks.org/reverse-words-in-a-given-string/>

My initial solution had a small bug, which I fixed later on.

**Q2:** Given a linked list and an integer n, write a function to remove every nth node from the list.

For Example, 1->2->3->4->5->6->NULL n=3;

Result: 1->2->4->5->NULL

**Round 4– Personal Interview 2:** This was the second technical round. A brief discussion on coursework was followed by three coding questions.

**Q1:** Given a binary tree and a target sum, return all the root-to-leaf paths which have the target sum. After solving this, the interviewer asked for some cases which could be used to test whether the code was working perfectly or not. Once he was satisfied, he modified the problem and now wanted to check whether any node-to-leaf path had the target sum. I briefly discussed my approach and it was good enough.

**Q2:** Given a string of length n, generate all possible substrings of the string. I initially misunderstood the problem, thinking all the  $2^n$  possible combinations of the string. Seeing the solution to this, the interviewer said that I am overcomplicating the solution and explained the problem once again. He seemed happy with the final solution I gave.

**Q3:** Imagine you have to build an API which would allow customers to book a hotel from all the available ones. How would you approach the problem and what data structures would you use for each functionality. It was an OOP problem and he was looking for a class design which could enable a customer to view hotel details and book one hotel.

**Round 5– Personal Interview 3:** This was the HR round. There was a detailed conversation regarding the project followed by basic questions. He asked me what books I had read and what was the toughest assignment I had completed in college and what were the problems I faced during it. After this, he asked me what would be the optimal way to search an element in an array. It was a rather vague question and I answered that for smaller arrays, linear search would be efficient enough but binary search would be more efficient for larger arrays. Then I was asked to implement a library system which could allow anyone to issue or return a book and find the corresponding dues left. He kept adding certain functionalities as time went on which were to be implemented by modifying the classes as per the needs.

In the end, a total of 5 candidates were selected for MS-IDC and 3 for MS-IT.

All in all, it was a memorable experience for me. The entire procedure from start to end was carried out very professionally and the interviewers were friendly and supportive. They were more interested in looking at how a candidate could practically apply the concepts he/she knew instead of seeing how many diverse concepts he/she is aware of.

My suggestions for other candidates would be to keep their cool during the process and to maintain their self-belief at all times. Keep your basics strong and learn to develop solutions from scratch instead of remembering several difficult algorithms. Providing correct approaches and thinking clearly matters more than actually giving the perfect solution.

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.

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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview experience | Set 98 (On Campus for IDC)

**Round 1 : (1hr 15 min)**

Online test on CoCubes contains 3 Coding Questions

1. Calculate difficulty of a given sentence. Where difficulty of a word is:

Word is hard if it has 4 consecutive consonants or number of consonants are more than number of vowels else word is easy. Difficulty of sentence is defined as  $5*(\text{number of hard words}) + 3*(\text{number of easy words})$ .

2. Linked list is given where a node has x and y value. You have to calculate changes in slope. So if m1 is slope between p1 & p2 and m2 is slope between p2 & p3 then if m1 is not equal to m2 then there is a change in slope. Total number of changes in slope were expected as return value.

3. Find the sum of all nodes that have no child at minimum level. Return -1 if root is NULL

Example –

```
5
/\ 
2 6
\ /
7 3 9 4
\ /
8 3
```

**Answer:** 14 (7+3+4)

After this round 8 students were selected for direct interview and 22 for group fly round. They asked two coding questions related to strings and trees in group fly round.

**Round 2 (Group-fly):**

Was called directly for round 3.

**Round 3 (Technical Interview):**

The interviewer asked me 6 technical questions for which he helped me getting the most optimized approach.

1. <http://www.geeksforgeeks.org/write-a-c-program-to-calculate-powxn/>  
But he asked me not to use recursion.
2. <http://www.geeksforgeeks.org/detect-and-remove-loop-in-a-linked-list/> I was asked to count the nodes in loop as well.
3. <http://www.geeksforgeeks.org/connect-nodes-at-same-level/> Asked me to do it without queues.

I can't recall the rest questions.

Then he asked me a simple DBMS design question. I had to implement student and subjects relation. Then asked me to **normalize** the schema. He also asked some theory questions from OS and DBMS.

**Round 4 (Technical Interview):**

The Interviewer asked me 3 coding questions and a lot of theory questions from DBMS and OS. Determine if two rectangles overlap or not. If they do, then separate

them in a given size of screen. The program should print appropriate message if separation is not possible. He basically wanted a mathematical approach. He also asked all the possible orientation of the rectangles.

1. <http://www.geeksforgeeks.org/find-maximum-path-sum-in-a-binary-tree/>. I couldn't give a proper solution, so he changed the question to find the maximum sum path with or without including root and leaf.
2. <http://www.geeksforgeeks.org/validity-of-a-given-tic-tac-toe-board-configuration/> . He wanted me to handle all the edge cases.

The interviewer helped wherever I got stuck.

#### Round 5 (AA):

The interviewer asked me to implement strtok() function.

Then he asked me to implement first reader's problem. This round was very chill. Interviewer helped me wherever he could. He then asked a few HR questions.

After this 3 got selected as FTE's Overall, the experience was nice. And the interviewers were friendly. **Thanks GeeksForGeeks!!**

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft  
Microsoft Interview

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## Microsoft Interview experience | Set 97 (On-Campus for IT Internship)

**Round 1** – It was an online coding round hosted on cocubes.com. It was a 75 mins round consisting of 3 coding questions only.

ques 1- given a number n and k. If the k bit in the binary representation of n is 1 then we have to make it 0 and return the new number formed else return n as it is.

ques 2- given a linked list where each node in the linked list represents a point in the xy plane, each node has 3 data members int x, int y and a next pointer. We had to print the number of changes in slope if we start from the beginning and take two adjacent points and repeat it till the end.

ques 3- <http://www.spoj.com/problems/AGGRCow/>

Students doing 2 or more questions correctly headed towards the next round. From the total of 150 students around 30 of them cleared this round.

**Round 2** – It was a group fly round, where 2 questions were given and 30 mins was the allotted time. It was a pen paper round.

ques 1- <http://quiz.geeksforgeeks.org/puzzle-16-100-doors/>, exact question just there where 500 doors and people instead of 100.

ques 2- find the length of the biggest palindromic substring present in a string and print the palindromic string.

People doing one question correct and the other one partially correct were shortlisted for the next round. 8 students were selected after this round.

**Round 3** – It was a technical interview round.

Firstly the interviewer asked me to introduce myself and then asked around 3-4 questions regarding my project. Then one by one the interviewer asked me 3 coding questions they were- 1) given an array of length (n-2) consisting of elements from 1 to n except for 2 elements are missing, find the missing elements. 2) print all the possible permutations of a string. 3) given a number reverse .

Then the interviewer asked me a few questions on OOPS and even told me to implement them on paper. He then asked me a few questions about OS. Then he asked me to subtract 2 numbers without using arithmetic operators and even the ++ and — operators. Then he asked me a puzzle and ended the interview. The interview lasted for around 45 mins.

**Round 4** – It was the HR round.

The HR was a very cool guy. He asked me questions regarding my project. Then few puzzles. He then asked some theory questions from around everywhere such as DBMS, OS, networking. Surprisingly he did not ask any coding question. He then asked me about my future plans and why I had such a low CGPA(8.31). He then asked me if I had any questions for him, then we had a 10 mins discussion on my question. The interview lasted for around 80 mins.

Finally 3 people were given the internship from our college. My suggestion is to keep your calm in the whole interview process, even if you don't answer any one of the questions just don't panic and try to give your best in the next question.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Microsoft

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## Microsoft Interview experience | Set 96 (On-Campus Internship for IDC)

**Round 1 : (1hr 15 min)**

Online test on CoCubes contains 3 Coding Questions

1) Find the number of times "carry" is 1 while performing addition on two numbers

**Input:** 56 99  
**Output:** 3

2) Given an array of integers, shift all the numbers that are '-ve' to the left and '+ve' to the right 'in-place' (maintain the order of all the -ve numbers same as of the given array and the order of all the +ve numbers same as of the given array )

**Input:** 10 7 -5 9 -12 15  
**Output:** -5 -12 10 7 9 15

3)Find the sum of all nodes that have no child at minimum level. Return -1 if root is NULL

**Input:** (Root of the tree is passed into the function)

```
5
 \
 2 6
 / \
7 3 9 4
   \
    8 3
```

**Output:** 14 (7+3+4)

Around 65 students were selected to Round2

#### Round 2 : Group Fliers(around 45 min)

We have to take 'n' polynomials as input and we had to write functions for

Sort(P), Add(P1,P2), Sub(P1,P2), Multiply(P1,P2)

(Implemented Sort function according to the indices of the polynomial and all the functions optimized by space and time)

Around 28 students got selected for technical interview

#### Round 3 : Technical Interview(around 40-45 min)

1)Tell about yourself

2)What are the courses you have done?

3)Suppose you have details of some stock market(Day & price were given), you will earn profit only if you buy stocks cheaper than the amount you sell them for. Write a program to find maximum profit that could be attained (using only one loop O(n) time and O(1) space)

**Input:**  
**Day :** 1 2 3 4 5 6 7  
**Price:** 60 10 5 12 8 40 9

**Output:** 35 (40-5)

4) Difference between Processes & Threads?

5) Suppose there is a sorted array and you are given the array by rotating k units.Find k by writing a program (O(logn) time)

**Input:** 5 6 7 1 2 3 4  
**Output:** 3 (3 rotations happened)

#### Round 4 : HR INTERVIEW(around 30 min) (On skype)

1) Tell about yourself

2) Previous intern experience and the details of the work assigned

3) What are the courses you have done and favourite course

4) Explain all sorting algorithms and decide which one is better

5) What projects have you done

6) Languages used.

7) Which was the most difficult task while doing your projects

8) How do you implement a library of books in json data(which fields were needed and stuff like that)

9) Why Microsoft & Do you think you are eligible for it

10) Goals and things you would like to achieve in future

Overall, the experience was nice. And the interviewers were friendly.

Thanks GFG.

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## GATE CS Corner Company Wise Coding Practice

## Microsoft Interview experience | Set 95 (On-Campus for IDC)

Microsoft came for Full Time IDC recruitment in our campus.

### Round 1

#### Online test on CoCubes contains 3 Coding Questions (Only Function to complete)

1. Find the nth number that contains the digit k or is divisible by k. ( $2 \leq k \leq 9$ )  
Example –  
if n = 15 & k = 3  
Answer : 33  
(3, 6, 9, 12, 13, 15, 18, 21, 23, 24, 27, 30, 31, 32, 33)
2. Add two binary number represented as strings.  
Example –  
num1 = 101101 & num2 = 1011  
Answer : 111000
3. Find the sum of all nodes that have no child at minimum level. Return -1 if root is NULL  
Example –

```
5
/
2 6
/\ 
7 3 9 4
/\ 
8 3
```

Answer: 14 (7+3+4)

After this round 11 are shortlisted for direct interview. I was one of them.

Many are selected from Group Fly round where they were asked to do paper coding.

After Group Fly 14 more are selected for interviews.

### Round 2

#### Face to Face Technical Interview Round (35 minutes)

1. Discussion on Project?
2. Difference between Process & Thread?
3. How web browsers use process & Threads, which is faster firefox or chrome and how?
4. How a Quad Core processor works?
5. What is tail command?
6. Given a very large file of unknown size, how will you print the last n lines (Number of lines not known)?
7. Write a program to connect next left node in a binary tree. Also first node of each level should be pointing to last node of next level? (Without using Queue)
8. Write a program to reverse a linked list in group of given size?

<http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>

Some Questions asked to my Friends –

1. Write a program for LRU Scheduling Implementation?
2. How a task manager works in Windows?

Out of 25 only 2 are selected by Microsoft IDC. I was not one of them. Most of us are eliminated after First Technical Interview.

In coding round the selection is based on time taken to make the code (Since codes are easy). Mine were not efficient. So try to complete as early as possible.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview experience | Set 94 (Internship)

First round (online round,)

It had some 15 mcq questions, most of it was technical, had questions from almost all CS subjects we learnt in college. I was lucky enough to guess most of the questions correctly and so was called for the coding round.

### **Second round**

For the selected students, there was a coding round which had 2 standard questions in data structures, from GeeksforGeeks.org. I solved one question fully with all test cases working, and later results were out after 1 month. I was lucky again to get through this round without having to solve one program....

### **Third round**

The next round was a group fly round(written programming round) which was to be followed by technical in person interviews. These rounds were held in Bangalore.

#### **1. Find the least common ancestor of two nodes in a binary tree.**

I asked the person assigned for my group if I could change the structure of the node, making the tree have parent pointers, and that person told ok. So, I changed the structure and made it have parent pointers, and also used a boolean flag variable, then it was very simple; when two nodes have any common node in its path from itself to root, then that node is the ancestor for these two nodes. So I assumed the function was given three parameters, root, node1 and node2...). And first I made an assumption that flag of all nodes zero, later I traversed from one node to root, making every node in that path have the flag variable set to 1. Later traversed from second node to root, and while traversing I checked if flag variable was 1 for any of the nodes already, if it was, then I returned that node as the ancestor of these two nodes.... Time complexity is O(h) (I THINK SO)...

I explained this well with all test cases....so that the person assigned to my group was happy with my solution.

#### **2. Given two sorted arrays (with repetitive elements) find the kth minimum number from both arrays.**

My approach to this problem was, Maintain an index for each array, both initialized to the first element of their respective array. Loop k times and in each iteration find the minimum element among the current indices and increment the index of the array containing the minimum. If the elements are equal, increment both indices. Time complexity is O(k).

I explained this well again with all test cases and made sure the person assigned to my group was happy with my solution.

As I made sure I took care of corner cases, and most importantly satisfied the person assigned to my group with the solution I gave, I was called for the in-person interview.

### **In – Person Interview**

A quick-brief introduction. We spoke In and out about my project, and also he wanted to see my app in my phone. He asked few basic questions about the project implementation.

Later he gave me a technical question, Fold and merge a linked list....I was comparatively little less nervous now, but was still not very good in paper coding.....made lots of mistakes but somehow wrote some code....but there were few mistakes here and there which I found and corrected when he pointed it out to me...But this time I wasn't lucky enough and was rejected after this round.

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Interview Experiences  
Microsoft

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## **Microsoft Interview experience | Set 93 (4 Yrs Experienced for IDC)**

1. Find square root of number without using sqrt function
2. Given a directed graph. Construct another graph from given graph such that if path exists from vertices A to vertices B and from B to C, then path from A to C and from C to A also should exist.
3. Write function which takes array of elements A and array of elements B and outputs (A-B)U(B-A).
4. Implement hashmap on your own. Write good hashing function for string.

Last round on some design questions.

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## **GATE CS Corner Company Wise Coding Practice**

Experienced  
Microsoft

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## **Microsoft Interview experience | Set 92 (1.8 Yrs Experienced for IDC)**

My resume was forwarded to Microsoft through a consultancy firm. I was called for a day long interview process at Microsoft IDC, Bangalore.

### **Round 1 (1 hour+):**

Question 1: <http://www.geeksforgeeks.org/median-of-stream-of-integers-running-integers/>

I first gave the insertion sort algorithm, he told me to improve upon it. I was stuck for some time so he gave me another problem: <http://www.geeksforgeeks.org/k-largest-or-smallest-elements-in-an-array/>. I was able to solve this in a few minutes using the Min Heap method, so he then told me to think on similar lines for the original question he gave me. After around 20-30 minutes of brainstorming I was able to solve it using the Heaps method.

Question 2: <http://www.geeksforgeeks.org/count-possible-paths-top-left-bottom-right-nxm-matrix/>

I solved this question pretty quickly. He asked me if I had come across this question before; didn't lie, told him I already knew this.

This was followed by discussion on what happens in the Bing Team at Microsoft.

#### Round 2 (1 hour+):

Question 1: Given a large text file, find an efficient algorithm to find the least distance(measured in number of words) between any two given words.

Solved this using hashing; he then extended the problem saying that this program would be executed a large number of times (to find distances between many pairs of words), so I need to improve my algorithm such that the time complexity is reduced after the first iteration of problem solving. Solved this using hashing and then using binary search to find the nearest index of the second word to the index of the first word in the hash.

Question 2: He first gave a background on how the autocorrect feature in phone keypads work, explaining that the probability of the autocorrected word would be greater than the typed word. He told me to find an algorithm to find the most probable word of length n that can occur given that there are m possible characters. The probability that a word can occur is give as:  $P(1st\ letter) * P(2nd\ letter\ given\ that\ 1st\ has\ been\ pressed\ already) * P(3rd\ letter\ given\ that\ 2nd\ has\ been\ pressed\ already) \dots$  and so on.. All values of individual terms in this equation is already given.

Think of the problem as a mxn grid where each element in a column is connected to every element in the next column by some weight. Solving this problem by bruteforce would  $O(m^n)$ . By storing the solutions of subproblems the complexity would reduce to  $O(m^n)$  which is the solution the interviewer wanted.

**Round 3 (1 hr):** Hiring manager round: Generic question but was a bit unexpected. Started off by asking about my current jobs and why I wanted to change, then the conversation went towards why I had chosen a non-CS course in my undergraduate, the conversation then took off on a completely different path about what computers can do and what computer science cannot do until it reached all the way upto The Turing machine. To be honest I was most nervous after this round.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Microsoft

## Microsoft Interview experience | Set 91 (2 Yrs Experienced for IDC)

This is the main forum where I did all my preparation. Thanks a lot GeeksForGeeks! Here's giving back..

I had got a call from the Bing team in IDC. I have 2 years of job experience post a BTech in CSE. I had 5 interviews in all, as described below.

1) The first one was a fly/ no fly round. At first, there was some discussion around my previous work experience, with the interviewer asking me some technical and design questions here and there. Then I was asked to write code to find the smallest subarray to sort that would sort an entire array. The answer is available at <http://www.geeksforgeeks.org/minimum-length-unsorted-subarray-sorting-which-makes-the-complete-array-sorted/>. I had to write optimized code for this.

The second was to do an ER diagram for a furniture scenario. The important part here being that Material of a furniture can be a separate class, rather than a property in furniture items like bed, chair, table. So Material can have associated properties like IsFlammable, IsWaterResistant, etc.

2) I got just one question in this interview which I was asked to solve on the board. The question was to add a digit to a number that is represented by a linked list, where each node is a digit of the number. The constraint here was that the linked list couldn't be modified, except the digits to be modified in answer and the number could be infinitely long. So you had to avoid the problem of memory overflow. So no recursion, no stack, no copy of linked list, no change to original linked list, as suggest the solutions on geeksforgeeks. To keep track of carry to be added to previous digit iteratively, you basically have to keep a track of the digit before the last consecutive 9 that preceeds the last digit. For example in 9719938996, this would be the 4the digit from right, that is 8. So now in a single pass, you can figure out such a position of 9(if any) and also the last digit. Then the required digits can be changed easily.

3) In this round, the interviewer opened a console app on his PC and asked me to code there. I believe he was actually taking note of the time I took to write the code and whether it compiled in the first time or not. I paid more attention to accuracy of code than to the time I took. The questions I was asked are:

Check if a number N is a power of another number X. Then we spoke of the case where X was 2. For this case, we discussed how this could be done by checking the bits.

Check if two binary trees are identical. I also had to initialise and run it with a test case. There was a discussion on line wise optimization after completing the code.

Rotate a matrix by a given distance. A similar answer where distance to rotate is 1 can be found at <http://www.geeksforgeeks.org/rotate-matrix-elements/>

Then there was a design discussion on designing a library's online portal. After I gave him a basic architecture, he asked how I would implement the search feature. I suggested doing that with the book's name, author, ISBN, etc. He asked me how to do it based on a book's content. I told him I'd store tags for each books that could be used while searching. He liked the idea, but prodded me about how I'd do a proper text search. I told him about using a hash table and blobs. Perhaps he was looking for tries, but since I was not much familiar with them, I avoided that. He seemed satisfied and ended the interview.

4) He asked me to introduce myself, talk about my projects and of the greatest technical challenge that I had faced. Then asked me to write code on paper for the LinkedIn feature where we are shown what is the connection depth of two people. The solution was a version of shortest path algorithm for a graph. He asked me to optimise my answer for  $O(1)$  extra space (besides the space of the graph structure).

The next scenario included a series of questions. I was to give the informal schema of Customer, Item, Order for an online retailer like Amazon. Apart from the foreign key relationships, he was interested in how I'd store the orders because each purchase order can have multiple items purchased. The answer was to have a relational table like ItemizedOrder which stored mappings of the order and item Ids. Then he asked me to write a query to get all customers who had not bought a certain item by a given date. Then he said that for any item like a book, the company will have to get their books from many book sellers who will have different schemas and ways of storing the books' information. He asked me to design a system that will allow handling such variation. I gave him a portal or a web service as an end point where the different vendors could upload their data. Then my web service would have a rule engine which would map different schemas, assign default values wherever possible for missing values like Subtitle, ignore missing values of unimportant fields like NoOfPages, else return error messages for items that had insufficient mandatory data, like Price. This rule engine would then store the processed input in our DB in our schema.

5) This was with a very senior guy, but was more of a formality. The interviewer told me I was selected in the first 10 minutes and then was just trying to analyze my work and preferences for a suitable team and set my expectations. He answered some questions I asked and ended the interview in half an hour.

In general, I was asked 2 common questions every time- Describe your previous work experience and why do you want to join Bing. I did not get the approach to most questions instantly, but I spoke of my thoughts aloud. They all guided me when I got stuck and prompted me towards optimizations possible. Twice, I was also given examples of scenarios which my code did not cover. Since I knew I was interviewing for Bing, I asked the interviewers relevant questions after each round. Each

interview was scheduled for 1 hour, though the third one got stretched to 1.5 hours and the last one was quite short. Except for the first interview, the outcome of the others is collective. So even if you don't do very well in one, if you can manage the others decently, you will be hired. All the best!

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Microsoft

### Microsoft Interview Experience | Set 90

I recently attended an interview at Microsoft. Following was my experience:

#### Round 1:

This was a written round. Everyone was given the following two questions:

1. Find all the nodes at a distance k from a given node
2. Given an array, arrange the elements such that the number formed by concatenating the elements is highest. E.g.: input = [9, 93, 24, 6], the output should be: [9,93,6,24]. This is because if you concatenate all the numbers, 993624 is the highest number that can be formed.

40 minutes was given for this round. However, if you request, they were giving extra time. After this round, lunch was served.

#### Round 2:

This was a face to face round. Almost everyone from first round was called in for the F2F interview. After a brief introduction, he asked me this question:

Given an array with huge data (say n, where n can be upto a million), the values in the array are in the range of 1-k where kRound 3:

I don't remember the question properly but it was something about arrays and swapping and finding the minimum cost possible.

#### Round 4:

<http://www.geeksforgeeks.org/longest-palindrome-substring-set-1/>

However, the interviewer wasn't interested in the code. He asked me to do a TDD for this problem. So he asked me to write test cases for this problem. He wanted to see if I can really analyze and find the various possible cases for this problem. After some struggle, I was able to find various different type of test cases. I gave a brute force solution.

#### Round 5:

<http://www.geeksforgeeks.org/maximum-difference-between-two-elements/>

However, I gave a different solution than the one mentioned in this page.

#### Round 6:

1. Write the implementation of String class. Implement any four methods of your choice.

2. Write a code for the tail method of linux where you have to read some x lines of huge files from the end without reading the entire file. I gave some solutions based on indexing. The interviewer was very friendly and helped a lot in arriving at the solution.

Since it was quite late by the time this interview was over, they arranged a cab for me to go back home.

Overall, the experience was very nice. The interviewers and the HR were very friendly.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 89 (For SDE-2)

First of all I thank GeeksForGeeks for giving right direction in Making my dream true.

Got short listed from a consultancy and They have shared a link of Microsoft where I have to submit the online test.

Online test has 2 questions need to be completed in 1hour

- 1) Did not remember
- 2) BST Tree Inorder is given need to print all possible BST trees from the above tree which have same elements.

Submitted psudo code and got short listed for interview.

10-30 AM interview started.

1. String is given need to print maximum length of string ( sub string) which is not palindrome

Solved o(n<sup>2</sup>) asked for optimization and code followed by test cases.

2. Discussion on abstraction and interfaces

11 – AM

1. Double linked list swap pair wise data
2. Double linked list swap pair wise links

3. Test cases ( i told list can have bad links)
4. verify for list is proper or not then loop detection
5. discussion on projects

2 PM

1. tool kit of nuts and bolts need to find the matching pairs of all.  
given O(n<sup>2</sup>) asked for optimization and code.

4-30 PM

1. discussion on projects
2. Compression algo for image data
3. Thread synchronization for producer many consumers (extension of producer consumer problem)
4. Find near to me restaurants approach ( told some approach using graphs which i also did not satisfy ).
5. Server is replaced with MS server in place of MAC server then how MAC client can use MS services design ( told adapter way).

5-30

Offer discussion .....

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Microsoft

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## Microsoft IDC Interview Experience | Set 88 (For SDE-2)

Total experience : 8 Years.

Interviewed for : SDE-2

Face to Face Round 1:

- 1) Tell us about your project and specific contributions.
- 2) How to find intersection of link list.
- 3) Length of the longest substring without repeating characters.

Face to Face Round 2:

- 1) Tell us about your project and specific contributions.
- 2) Remove characters from the first string which are present in the second string.

Face to Face Round 3:

- 1) Given a link list and input int K, reverse the link list in K size slots.
- 2) Print a binary tree in spiral order.
- 3) Find if a string is interleaved of two other strings. Str3 is said to be interleaving Str1 and Str2, if it contains all characters of Str1 and Str2 and order of all characters in individual strings is preserved.

Face to Face Round 4:

- 1) Explain one problem of the conducted interviews and explain how you solved it.
- 2) In a BST, two nodes are swapped. Find out these nodes and swap it.

A big Thanks to GeeksforGeeks for providing such a brilliant platform for interview preparation. Keep up the good work

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Microsoft

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## Microsoft IDC Interview Experience | Set 88 (For SDE-1)

Position : SDE BING TEAM

**1. Skype round :**

- i) Brief about agile software development process (as mentioned in my CV)
- ii) Detect whether the linked list is circular.
- iii) Check whether the number is a power of 2.
- iv) Check whether two trees are identical.
- v) Given an array which is first increasing and then decreasing, find the index where it changes from increasing to decreasing.

**2. F-F round 1**

- i) Find the LCA in a binary tree.

I gave the recursive solution as given in geeksforgeeks. Then he asked to give a solution without recursion. Then on asking for hints he said something related to heights and some modification is allowed in tree. So I did it using the parent pointer.

**3. F-F Round 2**

- i) Clone a linked list with a random pointer.
- ii) Given an array , find a subarray with the sum closest to zero (i gave O(nlogn) solution).

The interviewer was very co-operative. He gave a lot of hints to optimize the solution.

#### 4. F-F Round 3

- i) Given two sets of strings A and B. Find the (A-B) U (B-A) ( U = union ). The answer should be in lexicographical order and A's elements should appear before B's.

#### 5. F-F Round 4

i) He asked about my current project and since i am in android app development currently. So he asked questions like how many active users do u have.Whats the size of the app. Why such a big app?. How can u increase the usability?He wanted to check the ownership skills.

Don't ignore this round. Be prepared for such questions. Do ask for hints each time. The interviewer will guide you to the solution.

Thanks a lot geeks for geeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 87 (On-Campus)

15 MCQs on c/c++ output based, 1 java questions was also there.

#### Coding Round:

1. Convert a binary tree to its sum tree  
(<http://www.geeksforgeeks.org/convert-a-given-tree-to-sum-tree/>).
2. Count number of binary strings without consecutive 1's.  
(<http://www.geeksforgeeks.org/count-number-binary-strings-without-consecutive-1s/>).

#### Group fly round (for MSIDC):

1. Sort a string according to the order given by another string.

#### Group Fly round (for MSIT):

1. given a matrix with all cells black or white, write code to find the maximum sized sub-matrix with all border cells black (the interior cells need not be black).
2. Given an array of stock prices of different days, Maximize profit by buying and selling share at most twice.

Got selected for MSIT F2F interview:

#### F2F interview round 1:

Interview started with "Tell me about yourself". She went through my CV thoroughly and asked to explain one of the project. She asked my contribution, most challenging part, and few technical questions to this project.

Then She jumped to questions

- 1.explain types of database normalization (1NF, 2NF, 3NF, BCNF) with example.
- 2.Suppose you are given a database having a table with two columns, one is "name" and another is "id". name column is already filled and id column is empty. Write an sql query to populate the id column with unique ids. (she was interested in logic only not in sql syntax.)
- 3.Given a linked list and two integers x and y, traverse x nodes and delete next y nodes repeatedly until you reached to the end. and return resultant linked list.
4. Name few sorting algorithms with their time complexity and space complexity. Which is the best in terms of time complexity.
5. explain logic and write code for merge sort.
6. Check whether a binary tree is balanced or not. Discussed about self balancing binary trees (AVL tree).
7. there was one more easy coding question, sorry i forgot.
8. What is the difference between abstract class and interface. She was very nice and supportive. She was very quick as she has limited time of 1 hrs only.

#### F2F interview round 2:

It was more of HR round than technical round.

1. Tell me about yourself.
2. Do you have interest in sports? Which sport?
3. Usually What technical and non-technical things do you do in your free time?
4. Given a statement, write a program to check whether it is a palindrome or not.
5. Do you follow technology news? Which technology is trending in IT industries?

I told Machine Learning, then further he asked about machine learning, How much do I know ML, Whether I have done any ML project and then discussed my ML project. (It seems he was not judging me on ML things)

6. Given a linked list, check whether it has a loop or not, if yes find starting point of loop and length of loop.
7. I am done with interview, Do you have any question? I asked many question and discussed about work culture, promotions, whether I can switch to IDC or not etc. this discussion was too long (around 20 mins) and he was impressed by my questions.

He was very experienced guy, He was helping me while writing code and supporting me in all the discussions.

I would like to thank geeksforgeeks as I majority prepared from here only.

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## GATE CS Corner Company Wise Coding Practice

## Microsoft Interview Experience | Set 86 (On-Campus)

### Coding Round :

1. <http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>

2. Do not remember second question but it was on binary tree.

### Group-fly round :

Remove repeating characters from a given string in O(1) space and O(n) time , where n is the length of the given string.

### F2F Interview 1 :

The interviewer first discussed about my projects , specially my data mining project.

Then he asked me to write standard edit distance code and then to optimize it in terms of space, I did it in O(2\*n) instead of O(n\*m).

Second question was this : <http://www.geeksforgeeks.org/majority-element/>

### F2F Interview 2:

1. <http://www.geeksforgeeks.org/how-to-design-a-tiny-url-or-url-shortener/>

2. Question on linked list and involved swapping of nodes, do not remember the exact question.

### F2F Interview 3 :

1. <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

2. <http://www.geeksforgeeks.org/write-a-function-to-get-the-intersection-point-of-two-linked-lists/>

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## GATE CS Corner Company Wise Coding Practice

### Find multiplication of sums of data of leaves at same levels

Given a Binary Tree, return following value for it.

1) For every level, compute sum of all leaves if there are leaves at this level. Otherwise ignore it.

2) Return multiplication of all sums.

Examples:

**Input:** Root of below tree

```
2
 / \
7  5
 \ 
 9
```

**Output:** 63

First two levels doesn't have leaves. Second level has one leaf 7 and third level also has one leaf 9. Therefore result is  $7 * 9 = 63$

**Input:** Root of below tree

```
2
 / \
7  5
 / \ 
8 6  9
 /\ / \
1 11 4 10
```

**Output:** 208

First two levels don't have leaves. Third level has single leaf 8. Last level has four leaves 1, 11, 4 and 10. Therefore result is  $8 * (1 + 11 + 4 + 10)$

We strongly recommend you to minimize your browser and try this yourself first.

One **Simple Solution** is to recursively compute leaf sum for all level starting from top to bottom. Then multiply sums of levels which have leaves. Time complexity of this solution would be  $O(n^2)$ .

An **Efficient Solution** is to use Queue based level order traversal. While doing the traversal, process all different levels separately. For every processed level, check if it has leaves. If it has then compute sum of leaf nodes. Finally return product of all sums.

```

/* Iterative C++ program to find sum of data of all leaves
of a binary tree on same level and then multiply sums
obtained of all levels. */
#include <bits/stdc++.h>
using namespace std;

// A Binary Tree Node
struct Node
{
    int data;
    struct Node *left, *right;
};

// helper function to check if a Node is leaf of tree
bool isLeaf(Node *root)
{
    return (!root->left && !root->right);
}

/* Calculate sum of all leaf Nodes at each level and returns
multiplication of sums */
int sumAndMultiplyLevelData(Node *root)
{
    // Tree is empty
    if (!root)
        return 0;

    int mul = 1; /* To store result */

    // Create an empty queue for level order traversal
    queue<Node *> q;

    // Enqueue Root and initialize height
    q.push(root);

    // Do level order traversal of tree
    while (1)
    {
        // NodeCount (queue size) indicates number of Nodes
        // at current level.
        int NodeCount = q.size();

        // If there are no Nodes at current level, we are done
        if (NodeCount == 0)
            break;

        // Initialize leaf sum for current level
        int levelSum = 0;

        // A boolean variable to indicate if found a leaf
        // Node at current level or not
        bool leafFound = false;

        // Dequeue all Nodes of current level and Enqueue all
        // Nodes of next level
        while (NodeCount > 0)
        {
            // Process next Node of current level
            Node *Node = q.front();

            /* if Node is a leaf, update sum at the level */
            if (isLeaf(Node))
            {
                leafFound = true;
                levelSum += Node->data;
            }
            q.pop();
        }

        // Add children of Node
        if (Node->left != NULL)
            q.push(Node->left);
        if (Node->right != NULL)
            q.push(Node->right);
        NodeCount--;
    }

    // If we found at least one leaf, we multiply
    // result with level sum.
    if (leafFound)
        mul *= levelSum;
}

return mul; // Return result
}

// Utility function to create a new tree Node
Node* newNode(int data)

```

```

{
    Node *temp = new Node;
    temp->data = data;
    temp->left = temp->right = NULL;
    return temp;
}

// Driver program to test above functions
int main()
{
    Node *root = newNode(2);
    root->left = newNode(7);
    root->right = newNode(5);
    root->left->right = newNode(6);
    root->left->left = newNode(8);
    root->left->right->left = newNode(1);
    root->left->right->right = newNode(11);
    root->right->right = newNode(9);
    root->right->right->left = newNode(4);
    root->right->right->right = newNode(10);

    cout << "Final product value = "
        << sumAndMultiplyLevelData(root) << endl;

    return 0;
}

```

## Java

```

/* Iterative Java program to find sum of data of all leaves
of a binary tree on same level and then multiply sums
obtained of all levels. */

/* importing the necessary class */
import java.util.LinkedList;
import java.util.Queue;
import java.util.Stack;

/* Class containing left and right child of current
node and key value*/
class Node {

    int data;
    Node left, right;

    public Node(int item) {
        data = item;
        left = right = null;
    }
}

class BinaryTree {

    Node root;

    // helper function to check if a Node is leaf of tree
    boolean isLeaf(Node node)
    {
        return ((node.left == null) && (node.right == null));
    }

    /* Calculate sum of all leaf Nodes at each level and returns
    multiplication of sums */
    int sumAndMultiplyLevelData()
    {
        return sumAndMultiplyLevelData(root);
    }

    int sumAndMultiplyLevelData(Node node)
    {
        // Tree is empty
        if (node == null) {
            return 0;
        }

        int mul = 1; /* To store result */

        // Create an empty queue for level order traversal
        LinkedList<Node> q = new LinkedList<Node>();

        // Enqueue Root and initialize height
        q.add(node);

        // Do level order traversal of tree
        while (true) {

            // NodeCount (queue size) indicates number of Nodes

```

```

// at current level.
int NodeCount = q.size();

// If there are no Nodes at current level, we are done
if (NodeCount == 0) {
    break;
}

// Initialize leaf sum for current level
int levelSum = 0;

// A boolean variable to indicate if found a leaf
// Node at current level or not
boolean leafFound = false;

// Dequeue all Nodes of current level and Enqueue all
// Nodes of next level
while (NodeCount > 0) {
    Node node1;
    node1 = q.poll();

    /* if Node is a leaf, update sum at the level */
    if (isLeaf(node1)) {
        leafFound = true;
        levelSum += node1.data;
    }

    // Add children of Node
    if (node1.left != null) {
        q.add(node1.left);
    }
    if (node1.right != null) {
        q.add(node1.right);
    }
    NodeCount--;
}

// If we found at least one leaf, we multiply
// result with level sum.
if (leafFound) {
    mul *= levelSum;
}
}

return mul; // Return result
}

public static void main(String args[]) {

    /* creating a binary tree and entering
    the nodes */
    BinaryTree tree = new BinaryTree();
    tree.root = new Node(2);
    tree.root.left = new Node(7);
    tree.root.right = new Node(5);
    tree.root.left.left = new Node(8);
    tree.root.left.right = new Node(6);
    tree.root.left.right.left = new Node(1);
    tree.root.left.right.right = new Node(11);
    tree.root.right.right = new Node(9);
    tree.root.right.right.left = new Node(4);
    tree.root.right.right.right = new Node(10);
    System.out.println("The final product value : "
        + tree.sumAndMultiplyLevelData());
}
}

// This code is contributed by Mayank Jaiswal

```

Output:

Final product value = 208

This article is contributed by [Mohammed Raqeeb](#). Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

## GATE CS Corner Company Wise Coding Practice

Trees  
Microsoft

**Microsoft MSIT Interview Experience | Set 85 (On-Campus)**

Coding Round :

1. Binary tree was given. Return a tree such that each internal node stores sum of all its child nodes. Each leaf node stores zero.
2. One DP question : <http://www.geeksforgeeks.org/count-number-binary-strings-without-consecutive-1s/>

#### **GD Round for MSIDC :**

1. Reversal of Linked List in groups of K. <http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>
2. Peripheral Traversal of Binary tree. <http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>

#### **GD Round for MS-IT :**

1. Given numbers from 1 to 1000. Given a specific number, make guesses to reach to that specific number. In each guess, person will tell you specific number is less or more with the guess made. Find the minimum number of guesses.
2. Each day, Microsoft search engine bing posts some informative image. How will you ensure each day image is different from the beginning of posting? ( Note the word – informative). —> Do not distinguish on basis of color, texture, background etc. Think in terms of text. Even if orientation is different but text is same then image is same. Don't think for RGB value either.

#### **F2F Interview :**

1. How will you implement linked list with 1 million nodes? How will you access 999999 th node? Give some optimal design strategy and implementation.
2. A graph with 1 million nodes. How to handle? <http://www.graphviz.org/Documentation/GH10.pdf>
3. Design the technology architecture for bookmyshow application.
4. Explain your MTP Project.
5. Asked CSP projects. Thread Library, DOTA Game and Chord implementation.
6. Round Robin Scheduler Working.

This article is contributed by Surbhi Jain. 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.

## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Microsoft

## **Microsoft MSIT Interview Experience | Set 84 (On-Campus)**

### **Online test:**

Part 1: Written

Platform: Cocubes

15 MCQs 30 min

2 questions 1 hour

1) Longest Even Length Substring

Given a string of digits. Find the length of longest even length substring

such that the sum of left part = sum of right part. Return 0 if no such substring exists.e.g. given string 1523457. The longest even length substring will be 5234 so output= 4

2) Minimum difference of subarray

Given an array of length n. Divide the array between two subarrays such that diff between sum of each subarray should be minimum. for even n: subarray lengths should be n/2 exact for odd n: subarray lengths should be (n-1)/2 and (n+1)/2 e.g. given array 5,6,11,13,14,25 two subarrays: {5,6,25} and {11,13,14} diff between sums = 2 so output 2.

### **Part 2: Group Discussion(sort of Group fly)**

(Here we discussed code with MS officials for given question 45 min)

Given a timestamp in hh:mm:ss format find whether second hand lies in larger or smaller area formed by hour and minute hands.

### **Part 3: Interviews**

1. Simple questions on algorithms (20 min)
  - a. Swap 2 objects of different type without using third object
  - b. factorial of very large number (larger than big data)
  - c. Generate all permutations for a given string

2. Questions and logical puzzles, anagram finding, given a code correct it using just one operation from replace/delete/add a char.(20 min)

3. View about new technologies, what's your preference IDC or MSIT(15 min)

Overall interviewers were friendly and chill.

Thanks to GeeksforGeeks. It helped me a lot in my preparation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft IDC Interview Experience | Set 83 (On-Campus)

I recently got placed in Microsoft IDC .Here's my Interview Experience

The first two rounds were conducted by Cocubes.com in our campus. The other rounds were onsite. Microsoft was declared a dream company in our campus, students of streams CSE/ECE/MCA/MTech were eligible to sit. It had come for both Internship and Full time Positions.

#### Round 1 : Technical Aptitude

The first round consisted of 15 questions to be done in 30 mins.

The MCQs were based on C,C++,Java and some Operating System questions. Around 200+ from our college sat for this round.

#### Round 2 : Online Coding Round

After the first round around 100 (consisting of the internship students as well) students were shortlisted for the second round. This round had two coding questions to be done in 90 mins.

Everyone got different sets of questions. The questions I got were :

- Given two arrays where digits of one array represent a number, maximize the number by replacing it with elements of second array.

eg:

arr = {3,1,4,5,6}

rep = {1,9,5,2,3}

after replacement

arr = {9,5,4,5,6}

one digit of rep can be used to replace only once.

For this almost everyone who got this question used a brute force method. But I had used a different approach. I constructed a max heap of rep array. And ran a loop checking if the max element of rep was greater than the element in arr and then replaced it in arr and deleted the same from the maxheap.

- Given a matrix, where each cell represents a value of strength. The value could be positive negative or zero. At each cell the strength value is added. You have to reach from point (0,0) to point (m-1,n-1) if at any point the strength becomes zero or negative then you can't proceed further. Find the minimum strength required before starting to reach the end of the matrix.

eg . {{ 1,-3,0},

{-2,1,-1}} Ans: 2 ( (2+1+(-2)+1+(-1)=1 path taken )

I gave a DP solution but was unable to pass a few test cases in this question.

After this round around 15 students were shortlisted (including me 😊). After some days we got these results and then we received an invitation for On-site interview at MSIDC, Hyderabad

#### Round 3 : Written coding round

Around 30 students consisting of students from other colleges as well were called On-site. This was a written round. Everyone was given around 45 mins and 1 question.

- Given the root to a binary tree, a value n and k. Find the sum of nodes at distance k from node with value n. This is similar to this question on geeks -><http://www.geeksforgeeks.org/print-nodes-distance-k-given-node-binary-tree/>

I was able to do this quite quickly 😊 I even explained my answer to the HR and he asked me to write different types of test cases to exhaustively check if my code works on all of them.

After this round around 14 people were shortlisted.

#### Round 4 : Technical Interview

This was a personal interview round. The interviewer asked me about myself and the projects I have done so far. We briefly discussed those projects.

Then he gave me two questions to solve :

- Find an element in a rotated array <http://www.geeksforgeeks.org/search-an-element-in-a-sorted-and-pivoted-array/>
- Given two linked lists both represent a number. Create a linked list that contains its sum  
Same as -><http://www.geeksforgeeks.org/sum-of-two-linked-lists/>

These were fairly easy questions. I knew the solutions and explained it to the interviewer. He asked a few questions on them, seemed satisfied. Asked me if I had any questions for him. Well one thing I realized after giving interviews was when they ask the candidate for any questions then you should always ask something, shows that you are interested. So I asked him about the different technologies that a new SDE would work on and things like that. I had a pretty good discussion with him he told me many things from his end too.

I made it to the next round then 😊

#### Round 5: Technical Interview

This round was about Design questions . If you go through the previous interview sets , you will notice that Microsoft does ask Design questions to test the candidates ability to solve a real life problem. Everyone got different questions in their personal interview. The question I got was :

1. You have to design a Text Editor like notepad . You are concerned about the following functionalities – insert, delete, and search. You can assume the other functionalities of the text editor like save , display of text,etc are handled by some other developer. You just have to suggest what kind of data structures you would use to carry out the concerned functionalities efficiently  
– He told me to take my time and give the solution. I gave him a solution of considering the text as a linked list of words . Where each node in the linked list contained the word string and an index .And for every node in the linked list I will have Trie structure. I used trie for efficient search.What I suggested was that I use the trie whenever the user enters a word and insert it into the trie and the leaf of that word will contain the index of that word plus the pointer to that node in the linked list . If suppose the trie already has the word then i increase the word count in the leaf and the leaf will contain a vector that has the list of indexes where the word has occurred and the list of pointers where the word is present in the list.I wrote the code and explained how it can handle all corner cases . We discussed the the solution and he asked me certain questions on different test cases . My approach handled them well. He seemed satisfied . He added to the question that the search query could contain words or phrases . So my use of indexes could handle the phrase search . I also suggested that instead of Trie data structure we could use a Ternary Search Tree as that would be more space efficient.

I was a bit doubtful about this round but I made through ☺ After this round only few students made through to the final round .

#### Round 6: HR+Technical Interview

The interviewer was quite experienced and very pleasant. He asked me how my previous rounds went. He was going through my performance review from the previous rounds. He took a glance though my CV and asked me about the projects I did. He saw that I had interned at IITB so he asked me a lot on that project. He also asked me some basic HR questions like Why should Microsoft hire you ? Where do you see yourself in the next 5 years ?.He was very impressed with my academic record and my AIEEE rank. Asked me how I handled my 12th board exams and entrances. He made it very comfortable and was almost chatting and getting to know about me.

1. Then he asked me about the question given to me in the previous round i.e Text Editor . I gave him a brief explanation on my approach . He then gave me another question based on Text Editor. He asked me how could I retrieve K most Frequent words from the text efficiently. Thankfully I was just going through this question just before this round ☺ . I suggested the solution using Trie and Min Heap.  
Similar to -> <http://www.geeksforgeeks.org/find-the-k-most-frequent-words-from-a-file/>  
He asked me to write the code for the same. I wrote it down and explained it to him.
2. The next question he gave me was :- Given a binary search tree , print the path which has the sum equal to k and has minimum hops. i.e if there are multiple paths with the sum equal to k then print the path with minimum number of nodes.  
First I gave him the brute force approach . Similar to -><http://www.geeksforgeeks.org/root-to-leaf-path-sum-equal-to-a-given-number/>  
But I knew it wasn't using the fact that we have a Binary Search tree . So the interviewer gave me some hints – like what is main criteria of a BST . I immediately figured out that the minimum path will always be on the right side of the node because it has the larger value. I told him the solution he seemed satisfied..

He then asked if I has any questions for him . So I asked him about where I can improve myself , he said I didn't need any improvement I am doing very well and that I should just keep doing what I am doing ☺ That certainly made my day I asked a couple more questions about Microsoft and then left.

Finally after a week the results came I received the mail that I had been shortlisted for a Full Time Position ☺

#### Tips :

- Have a good grasp on Data Structures. Solve as many problems possible from Geeks4Geeks
- Be confident in the interview . Have a smiling face and be adaptable to the question . The interviewer can anytime change or twist the question just to confuse you.
- The interviewers are very helpful , if you feel stuck communicate with them ..explain your approach they will give you hints.
- When the interviewer gives the question listen to it carefully do not immediately rush to writing the code .. ask him about the different criteria and restrictions pertaining to the question.
- Check your code with all possible test cases and list them.
- Lastly , even if you aren't able to get the right solution then just explain your approach . Recruiters analyse how you tackle the problem not necessary that you have to have the accurate solution.

Thanks to geeksforgeeks it really helped me through my placement prep. The wide range of questions on Data Structures certainly helped a lot.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 82 (On-Campus)

Here, I would like to share my interview experience for Microsoft IDC Software Engineering profile. It was On-Campus.

#### Primary round:

There were two test rounds, one was MCQs (15 Qs) on C++ basics and the other was Coding (2 Qs). Test was conducted on cocubes platform.

First round was easy. It had Qs on C++ o/p, algos, classes, struct and union, DS and one was on Java. All were shortlisted for the coding round.

#### Coding round:

Q1) find the sum of all cousins of a given key in a binary tree.

Q2) Reverse a linked list in groups of size k.

Prepare linked list and trees Qs from geeksforgeeks, that would suffice to crack this round.

**GroupFly Round:**

120 students were shortlisted for this round. we were divided into groups of 10. Each group was given a coding Q and we had to solve it in 20 mins. They want you to discuss the approach with them and write proper code. List out all the boundary cases clearly. Keep clarifying yourself by asking any query regarding the Q given.

Questions:

- 1) Given a sorted array, with some unknown rotation, i.e, the smallest element is shifted circularly. Find the smallest element.
- 2) Swap two given elements in a singly linked list
- 3) Design an algorithm for storing Tiny urls mapped to large ones. You are given a pool of tiny urls and you are asked to maintain their record of map against the large urls. 3 functions to be implemented: ASSIGN: it has to assign a tiny url to the large one which is taken as an argument to the function. ACCESS: it has to return the corresponding large url for the tiny url passed as an argument. RECLAIM: It has to remove all the large urls which were not accessed since mentioned time(which is passed as an argument) from the map and make the corresponding tiny urls available. You have design a system to do this and all the operations should take O(1) time complexity.

**Technical Interviews:**

There were 3 rounds of technical interviews, one coding Q in each round.

Round 1 : Q) Given a sorted array, with some unknown rotation, i.e, the smallest element is shifted circularly. Find the smallest element.

Round 2 : Q) Write the code for 'strtok' function (it's a C function)

Round 3 :

Q1) It was based on my internship. He asked me to explain the work I was involved in.

Q2) Some random Qs on my internship topic.

Q3) He asked, how would I detect a cycle in a singly linked list, then to mathematically prove that algo.

Q4) Some random Q on math and programming.

Q5) How to evaluate an infix expression. Write the code.

It was great conversing with them. They were very friendly. They encourage you all time giving hints and appreciating your progress. They were very active and generous at the same time. They look for your approach more than the way you write the code.

**Tips:**

Speak out the way you are thinking and the way you solve it. They want your approach. Clearly understand the Q. Ask for any query you get in mind. In fact you keep clarifying yourself, they like that.

List out all the different boundary cases and handle them.

They will ask you to optimize the code, so gain experience by solving more and more Qs

There was nothing like HR round.

Just be confident in all the rounds. That will suffice.

Company is going to see how good your approach is. They wont check how much information you know, they look how well you are able to solve problems. Look for all the various cases possible and try to write error free code.

Just keep solving Qs from geeksforgeeks and learn the funda. Solve some competitive coding Qs from Hackerrank and other websites. That will suffice. Happy preparation!

Thank you

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 81 (For Internship)

**First round** was technical aptitude. Around 120 students sat for it. 15 MCQs were asked- Everyone had different sets. All sorts of questions were asked, I had each question on C, STL, sorting, Java, Computer Architecture and OS.

**Second round- Coding.**

Around 60 students were shortlisted and coding round was conducted the same day. Everyone had different questions. Two problems were given and I had-

1. Find sum of data of all leaves of a binary tree on same level and then multiply sums obtained of all levels.
2. Two linked lists are given each containing a positive number find the difference of the two number and store it in a linked list and return reference to the head of the resulting linked list.

Eg: LinkedList1: 6 -> 5 -> 3 -> 0

LinkedList2: 4 -> 5 -> 2 -> 0

Output -> 2 -> 0 -> 1 -> 0

People who solved both and some with one were shortlisted. Results were announced after a month.

25 people were shortlisted after second round and were called to Bangalore.

Many students from different colleges were present for process there.

### **Third round- Group fly.**

This was elimination round. Two questions were to be solved in one hour. A mentor was assigned to each group of 8-9 students. We had to discuss our approach and then code it and submit.

1. Remove duplicates from string in place in O(n).
2. Check whether given binary tree is balanced or not. Definition was no two leaves should have height difference of greater than one.

People who solved both were shortlisted.

### **Fourth round – Technical interview (45 min to 1 hour)**

Interviewer was responsive and very co-operative.

First 15 min discussion on my projects. Then he asked me a question on arrays.

Given three arrays(arr1, arr2, arr3) each containing distinct positive numbers find three numbers a,b,c each from arr1, arr2, arr3 respectively such that (abs(a-b) + abs(b-c) + abs(c-a)) is minimum. I gave an nlogn approach for it and then I was to write the code on paper.

Final round was HR

Apart from the HR questions I was asked about to explain Overflow and Underflow Arithmetic Exception and write code to detect it.

Overall experience was very good. The final results were declared 10 days after the interviews got over.

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Interview Experiences  
Microsoft

## **Microsoft IDC Interview Experience | Set 80 (For Internship)**

Recently Microsoft visited our campus for IDC internship program and following is my interview experience.

**Online MCQ Round:** It consist of 15 MCQ Questions on Cocubes.com. This was an easy round and consists of mainly output questions of c++/Java .  
Apart from this some questions on OOPs and Operating Systems.

### **Online Coding Round:**

Two coding problems in one hour,again on Cocobues.com

1. Given two arrays of numbers. The numbers are from 0-9 you have to maximize the first array by using the elements from the second array.

the elements can be used only once.

e.g. arr1[] = {5, 2, 3, 6, 7};  
arr2[] = {9, 2, 8, 4, 5};

You should output the modified arr1 as {9,8,5,6,7}

2. Given a matrix of characters and a word.

you have to count the number of occurrences of that word in that matrix. you can move to any of the eight valid directions from current position.

e.g. word="HELLO";  
matrix[5][5] = { ('H','E','L','L','O'),  
 ('E','H','E','A','B'),  
 ('L','L','O','C','D');  
output should be : 5

Now after a long one month break, they displayed the results.

I was lucky enough to get selected.

All other rounds were taken at Microsoft IDC hyderabad centre.

### **Elimination Round:**

One Coding question was given to all the students , You have to code and explain it.

You are given an string as input which represents a path. You have to normalize that path inplace(NO EXTRA SPACE).

e.g.  
input : "a\b\c\..\file.txt"  
output: "a\file.txt"

Hint: Double dot(..) means you have to skip the previous parent.

### **Interview Round I:**

Firstly,Tell me about yourself and some discussion on projects and what i have learnt till now.

Coding Question on pen & Paper: You have a Binary tree having numbers>=0 and a number N.

Print all downwards paths from any node having the sum of elements equal to N.

I gave a simple recursive algorithm then he ask me to optimize, then after around 10 min i gave him another solution a little bit optimized. He again ask me to optimize more. I tried but can't do more optimisation ,So he ask me write code and said the main purpose of the interview is to write the correct code.

### **Interview Round II:**

The interviewer asked me what i have done in technical till now, and saw my resume for a while, then gave me a question which i have to code and explain.

You have a cuboid (m\*n\*p) each block of the cuboid is having a metallic ball.

Now we are passing X-ray from front face and getting a bool matrix1 of m\*p the elements are set if there is a black spot.(as we are passing X-ray) and another matrix2 of n\*p by passing X-ray from right face.

Now you have to print the co-ordinate (i,j,k) where metallic balls are present.

Is it possible to get the accurate result from given data or you need more data. If you need more data then what data you need ?

I explained my approach to him , made a code and asked him to provide me more data ( The m\*n matrix ) to get the more accurate result.

A Big Thanks to GeeksForGeeks.

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.

## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

### Microsoft IDC Interview Experience | Set 79 (For Internship)

**First round** was technical aptitude. Total 65 students were eligible. 15 MCQs were asked-

Everyone had different sets. All sorts of questions were asked, I had each question on linked lists, binary tree, B tree, STL, sorting, Java and OS.

#### Second round- Coding.

Around 40 students were shortlisted and coding round was conducted the same day. Everyone had different questions. Two problems were given and I had-

1. Find max index difference j-i such that  $a[j] > a[i]$  and  $j > i$ .
2. Find sum of data of all leaves of a binary tree on same level and then multiply sums obtained of all levels.

People who solved both and some with one were shortlisted. Results were announced after 3 weeks.

14 people were shortlisted after second round and were called to Bangalore.

Many students from different colleges were present for process there.

#### Third round- Group fly.

This was elimination round. Two questions were to be solved in one hour. A mentor was assigned to each group of 8-9 students. We had to discuss our approach and then code it and submit.

1. Remove duplicates from string in place in  $O(n)$ .
2. Check whether given binary tree is balanced or not. Definition was no two leaves should have height difference of greater than one.

People who solved both or at least gave proper approach for both were shortlisted.

#### Fourth round – Technical interview (45 min to 1 hour)

Interviewer was polite and responsive.

First 15 min discussion on my database project, he asked me questions like what technologies I used for front end and back end. I explained all the functionalities.

Then he asked me a question on binary tree.

Connect nodes on same level in a binary tree. Initially I gave him level order approach where I used recursive function to access each level but as it was  $O(n^2)$  he told me to optimize the solution.

Then I gave him iterative approach of following-

<http://www.geeksforgeeks.org/connect-nodes-at-same-level-with-o1-extra-space/>

He said the code will be complex and there will be many cases, so he told me to think of another approach. I wasn't able to give another approach other than these.

**Final round was HR** but I wasn't called for it.

Overall experience was good and mentors, interviewers were very polite.

Thanks to geeksforgeeks team for putting such good content on website. I would advice to go through problems on website as it improves thinking and approach.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 78 (Telephonic for IT)

Following questions were asked in the second round of telephonic interview:

1. Asked about some questions related to Design patterns.

2. Find a loop in linked list

<http://www.geeksforgeeks.org/detect-and-remove-loop-in-a-linked-list/>

3. Length of the loop

Soln: Once the loop is detected, keep the slow pointer as it is, but move the fast pointer with a count variable until it reaches the slow pointer.

4. Variation of find a largest sum of contiguous array

<http://www.geeksforgeeks.org/largest-sum-contiguous-subarray/>

5. Given two nodes in a graph, check if they are connected or not. Pre processing can be done but the result should be computed real quick

Soln: Create a hash map with key as a single node and value as a list of all connected nodes

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# Microsoft Interview Experience | Set 77 (For IDC Internship)

Recently Microsoft visited our campus for IDC internship program and following is my interview experience.

**Online MCQ Round:** It consist of 15 MCQ Questions on Cocubes.com.This was an easy round and consists of mainly output questions of c++/Java .Apart from this some questions on Virtual functions and Operating Systems.

### Online Coding Round:

Two coding problems in one hour,again on Cocobues.com

- Save all leaf nodes of a Binary tree in a Doubly Linked List by using Right node as Next node and Left Node as Previous Node.

<http://www.geeksforgeeks.org/connect-leaves-doubly-linked-list/>

- Given an array,find the maximum  $j - i$  such that  $arr[j] > arr[i]$  .

<http://www.geeksforgeeks.org/given-an-array-arr-find-the-maximum-j-i-such-that-arrj-ari/>

It took me 40min to code both the Questions.

### Group Fly Round:

Since I was among top 4 student till second round therefore I was selected directly for Interviews. But yeah according to my friends this was a bit tough round.Only 3 students were shortlisted from the remaining students.

### Interview Round I:

Firstly,Tell me about yourself and some discussion on projects.

Coding Question on pen & Paper: Convert a String to Integer considering **each and every damn corner case**.

### Interview Round II:

Shortest Round among all,One Coding Question on pen & paper:

Remove **Alternate** Duplicate characters from a **char array** you have to do it **in Place**.Like keeping **only the odd occurrences of each character**.

Example:

Input: "you got beautiful eyes"

Output: "you gtbeaiful es"

Allowed Time Complexity was **O(n)** and Space Complexity was **O(1)**.It took 10min to come up with an algo.The interviewer was satisfied with my algo and said "no need to write the code".

Hint : Use two Pointer Method and Bool array of length 256.

A Big Thanks to GeeksForGeeks.Except the Last question all questions were from GeeksForGeeks

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## GATE CS Corner Company Wise Coding Practice

# Microsoft Interview Experience | Set 76 (On-Campus)

Recently Microsoft visited our campus for recruitment and following is my interview experience.

### MCQ Round-

15 MCQ questions from C , C++ , java (1 question) , aptitude , etc on cocubes.com. There was no negative marking. Very few students eliminated in this round.

### Coding Round –

#### 2 coding questions –

Q1.You are given a matrix of size M x N and only possible values in the matrix are

0 ? representing empty position

1 ? representing a fresh apple

2 ? representing a rotten apple

A rotten apple converts all the fresh apples to rotten ones which are adjacent to it in 1 unit of time. Given an input the matrix and you have to calculate the amount of time in which all the fresh apples become rotten. Also determine whether all fresh apples could be made rotten in finite time or not.(10 marks)

**Input**  
2 1 0 2 1  
1 0 1 2 1

1 0 0 2 1

**After** 1 time unit, the matrix will be transformed to

2 2 0 2 2

2 0 2 2 2

1 0 0 2 2

**After** 2 time units the matrix will look like

2 2 0 2 2

2 0 2 2 2

2 0 0 2 2

Hence output should be 2 time units. (Definition of adjacent only included the left , right, bottom and upper cell and NOT diagonal cell)

Q2.Find all nodes at k-distance from a given node in a binary tree – <http://www.geeksforgeeks.org/print-nodes-distance-k-leaf-node/>. (10 Marks)

Some students were short listed for Microsoft IT , some for Microsoft IDC and some for both.

Group fly round was conducted for some students and some students were directly selected for interviews.

#### **Group Fly Round –**

For Microsoft IDC – Remove all duplicates from the input string <http://www.geeksforgeeks.org/remove-all-duplicates-from-the-input-string/>

For Microsoft IT – Design name , role and permission system in which whenever user enters his role and name then permission granted to him (read ,write or execute) will be output.

#### **Interview 1 –**

1.Tell me about yourself.

2.In a file there are 1 million words . Find 10 most frequent words in that file. <http://www.geeksforgeeks.org/find-the-k-most-frequent-words-from-a-file/>

I gave the solution using trie and min heap.He asked me to write program assuming that insert and deletion of trie and heap is given.

Then he asked me about what should be test cases.

The following are the test cases –

a)if file contains a word which is in inverted commas like "abc def". Here "abc def" should be considered as a single word but my program was taking "abc def" as two different words – (i) "abc" (ii) "def".

b)if file contains characters like tab (\t) , \r etc. then my program would not work.

3.Some questions based on virtual memory concepts.

4.Write name and average case running time complexity of any 6 sorting algorithms.

5.When merge sort should be used ?

6.Any question about Microsoft ?

#### **Interview 2 –**

1.Find the first circular tour that visits all petrol pumps – <http://www.geeksforgeeks.org/find-a-tour-that-visits-all-stations/>.

First i gave a brute force solution. Start with Every petrol pump and check if circular tour is possible. This solution takes  $O(n^2)$  time complexity then he asked me for optimised solution.

I was unable to optimise but when he gave some hints then I gave  $O(n)$  solution. After that he asked about running time complexity of the problem and then he asked me to code.

2.What is the use of indexing in relational table ?

3.If join is applied on two tables – table1 and table2.Suppose table1 has more number of rows than table2 then table1 joins table2 takes more time to execute or table2 joins table1 takes more time to execute ? (Assume that there is no indexing in both the tables)

3.Some questions based on my projects.

4.In which technology do you have passion ?

5.Any question about Microsoft ?

#### **Interview 3 –**

1.Are you comfortable with linked list ?

I said yes then he asked two questions from linked list.

2.Clone a linked list with next and random pointer – <http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/>.

3.Serialise and Deserialise a linked list with next and random pointer.

Serialise and deserilise a linked list means to save a linked list in a file and then using that file make same linked list again.

First I gave  $O(n^2)$  running time solution then he asked for optimisation. Then I gave  $O(n)$  running time solution using hashing.

He was giving me hints whenever I got stuck.

#### **Interview 4 (HR) –**

1.Why Microsoft should hire you ?

2.What did you do in this summer ?

3.Some questions based on my project.

4.Construct a binary tree from given inorder and preorder traversals. <http://www.geeksforgeeks.org/construct-tree-from-given-inorder-and-preorder-traversal/>

5.Any question about Microsoft ?

In interviews they were giving sufficient time for thinking solution and they were helping whenever I got stuck.

My primary source for preparing for placement is GeeksForGeeks. Almost all the questions asked in all rounds are there in GeeksForGeeks. I thank a lot GeeksForGeeks for providing very nice materials for preparation for placements.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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## Microsoft Interview Question for Internship

### Round 1- Coding round

You are given a matrix  $n \times m$  filled with integers. There is a robot which has to travel from the cell  $(1,1)$  to cell  $(n,m)$  and the robot can move only one cell to the right or downwards. The robot requires strength to travel from one cell to another. He can only move forward if his strength is positive. When he moves to a cell, the cell value is added to his strength (value can be negative or positive). Calculate the minimum strength you have to give to the robot initially so that he can make it to the last cell.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

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## Microsoft Interview Experience | Set 75 (For SDE II)

I recently attended Microsoft Interview for their CRM team in Bangalore.

### F2F Round 1:

Design and Implement: Producers and Consumer Problem. Producers produce different kind of messages and Consumers register themselves for different kind of messages. Need to design and implement Producer, Consumer and a Delegator which is responsible for storing and delivering the messages to appropriate listeners.

Changed the question to handle millions of messages.

Changed the question to handle different priority messages.

Threading model for Producer, Listener and Delegator.

In the end he asked me to code 2 methods of Delegator.

1: which adds the message from Producer to its internal queue.

2: Delegate, which delivers the message to appropriate listener.

My Opinion: There is no right or wrong answer for design question, in fact the interviewer also told the same thing. Start with something simple, a minimalist design and improve/change as requirement changes.

### F2F Round 2:

1. A  $M \times N$  matrix containing integers (positive, negative and zero's). For every position containing 0, mark the corresponding row and column as 0.

Told him the queue approach. But he wanted with  $O(1)$  space complexity in  $O(n)$  time complexity.

2. Variation of <http://www.geeksforgeeks.org/find-the-k-most-frequent-words-from-a-file/>

### F2F Round 3:

1. Implement  $\text{Power}(x,y)$  without loop. Interviewer wanted all test cases covered like  $\text{Power}(x,0)$  and most optimized solution.

2. Rotate  $M \times N$  matrix by 90 degrees. This is where my luck ran out, The interviewer gave me hint, but still couldn't come up with solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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## Microsoft Interview Experience | Set 74 (For Software Engineer in IT Team)

Have been interviewed for Microsoft India, Hyderabad location for their IT team for Software Engineer role.

Following questions were asked in the first round telephonic interview

1. How is C++ better than C?

2. When do you use overloaded functions and when do you use overridden functions?

3. I have a list of customer objects which in turn can contain a list of Order objects which in turn can contain a list of Item objects. Need a Reporting module that will be total amount of purchase done by each customer and total amount of purchase done by all the customers. What modifications has to be done in the classes?

Ans: Gave few approaches but he was not satisfied.

4. There are three different types of users – employee, admin and manager. Each user should have different permissions. How will you achieve this?

Ans: Users will be the base class. Employee, admin and manager will be the derived classes. I was not sure of how to do this in the interview. But, thinking now. We can have overridden functions in each class of admin/employee/manager such that if the user does not have permission the function in that particular class can just return error without performing any action. If the user has permission, the actions can be defined in that function.

5. Given a linked list, reverse the nodes from  $(n-x)$ th node. Given only x.

Ans: Have two pointers. One pointer will be at the head node, increment the second pointer until it reaches  $x$ th node. Now increment both the pointers until the second pointer reaches end of the linked list. Now reverse the linked list from the first pointer location onwards

6. In class car, accelerate() is a method that increases the velocity variable each time the method is called. The requirement is to alert the user when the velocity reaches its maximum limit.

Ans: I told that we can change the accelerate() method to return a bool var of True whenever the limit is reached. He asked for other ways. I told the user can keep polling every time if the maximum limit has reached or not. He is not satisfied.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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### Microsoft Interview experience | Set 73 (On-Campus for IT SDE Intern)

MSIT visited our campus. 5 days before the visit, there was an online assessment which included two processes both hosted by cocubes:

**1. MCQ round:** It had 15 questions from c,c++ and java to be done in 30 minutes.

Mcq were easy but long so time consuming. There was no negative marking. I solved around 8-9.

After half an hour results were announced. 54 students got selected out of 110 almost.

**2. Coding round:** 54 students wrote online coding questions. Everybody had different questions, some had same. two questions to be solved in 60 minutes.

Compiler: you cannot use standard template library. You can only write functions. So if you need push or pop functions you have to write it from scratch. They gave you prototype of function. And you write its body.

**1st question:** Given two linked lists represent two no. Subtract the second one from first one. No memory should be allocated. You can alter the given linked lists. Head node of answer linked list needed to return.

<http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>

this question's approach can be useful to solve this question.

**2nd question:** Sum of the boundary nodes. It was solved by using boundary traversal approach. <http://www.geeksforgeeks.org/boundary-traversal-of-binary-tree/>

Microsoft team came with the result. They selected almost 25 for group fly and 6 (who performed well in coding round) for direct technical interviews.

**Group fly:**

I was among the direct ones. So I don't know the question.

**Technical interview:**

Interviewer was amazing and supportive. My interview is of 80-85 minutes.

He asked me about coding round questions. Asked how many I solved. Which approach I used. How could I make it better.

Then he asked me to find no of palindrome in the a paragraph. I did it. He helped me while writing the code. He asked some questions on hash map, sql and arrays. Then he started discussing my projects and interview ended up in the discussion.

**HR:**

Normal hr round. Interviewer was serious but not demoralizing. Asked to implement library management system. Discussed my projects. one Idea to innovate at Microsoft. This went well.

I really want to thank geeksforgeeks for its amazing collection.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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### Microsoft Interview Experience | Set 72 (For Software Engineer)

Online Round on Hackerrank – 1 Hr:

1. Maximum product sub-array.

<http://www.geeksforgeeks.org/maximum-product-subarray/>

2. Building bridges across cities. Find the maximum number of bridges that can be built.

**Round 1:**

1. Find the median of two sorted arrays.

<http://www.geeksforgeeks.org/median-of-two-sorted-arrays/>

2. Store a mirrored matrix (  $\text{Mat}[i][j] == \text{Mat}[j][i]$  ) efficiently.

**Round 2:**

1. Stream of urls coming, find out top trending topics

General discussion around designing such a system in a distributed setup.

2. Discussion on designing a spam email detection system.

**Round 3:**

1. Rotate a given array.

<http://www.geeksforgeeks.org/array-rotation/>

2. Count frequencies of elements in an array.

<http://www.geeksforgeeks.org/count-frequencies-elements-array-o1-extra-space-time/>

**Round 4:**

1. Connect nodes at the same level in a binary tree.

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

2. Design a LRU cache

<http://www.geeksforgeeks.org/implement-lru-cache/>

3. Find a given word in a board of characters

<http://www.geeksforgeeks.org/boggle-find-possible-words-board-characters/>

Would like to thank geeksforgeeks for the big collection of relevant 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 71 (Off-Campus)

**Written test:**

They conducted written test in HackerRank and an hour duration. They asked me to implement the functions for the following two problems.

- 1) Maximum product Sum of an Array.

<http://www.geeksforgeeks.org/maximum-product-subarray/>

- 2) Building bridges problem.

<http://www.geeksforgeeks.org/dynamic-programming-set-14-variations-of-lis/>

**Technical Interview 1:**

He is very friendly and given hints to me while solving problems.

- 1) First he asked me about an overview of my current project then most challenging thing faced in the project. After my response, he asked me what you learnt from that challenging thing.

- 2) Given an array of integers of the size of n, it contains zeros in random positions, we need to move all zeros to end of the array in a single scan without extra space.

<http://www.geeksforgeeks.org/move-zeroes-end-array/>

- 3) Merging point of two linked lists.

<http://www.geeksforgeeks.org/merge-two-sorted-linked-lists/>

- 4) questions related to programming languages

- a) about inheritance
- b) about classes and interfaces
- c) abstract classes and virtual functions, ...

- 5) He given a situation and asked me to design required classes and functions which are useful to program that situation.

- 6) The last question is given a number we need to find the next nearest number in  $2^n$ .

input: 127 output: 128

input: 129 output: 256

**Technical Interview 2:**

He asked me very simple questions, but he wants to cover each and every corner case.

- 1) Reverse group of elements in a linked list

<http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>

- 2) perform push,pop and min operations of stack in O(1) time.

<http://www.geeksforgeeks.org/design-and-implement-special-stack-data-structure/>

**Some suggestions:**

- 1) Practice on paper, don't practice on the computer.

- 2) While practicing, we should try do the question our own then see the answer, don't go directly to the answer.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

# Microsoft Interview Experience | Set 70 (On-Campus for IDC and IT)

Microsoft recently visited campus to hire interns for IDC and IT profiles.

I'd like to share my experiences.

1. **Online MCQ Round** – about 15 questions and 30 minutes – MCQ questions on cocubes.com  
Problems were mostly output type questions in C and Java with a few questions on Combinatorics.

2. **Online Coding Round** – Two coding questions on cocubes, one hour provided.

First question was given a binary tree, write a function that returns a linked list of the leaves of the tree such that

- a) Nodes in the linked list are in the order of left-most leaf to right-most, i.e, head is the left-most leaf
- b) Using constant ( O(1) ) memory – storing the pointers etc not allowed

Second question was, given an array and a window size that is sliding along the array, find the sum of the count of unique elements in each window.

For example, if the array were 1 2 1 3 3 and window size was three

First window - 1 2 1 - only two unique = 1

Second window- 2 1 3 - all unique = 3

Third window - 1 3 3 - only one unique = 1

Total = 1+3+1 = 5

Which was to be returned.

Few people solved it in O(n) but most solved it in O(nk) where n is the size of the array and k is window size.

3. **Group Fly Round** – Two problems were given, to be solved in about twenty minutes (maximum)

The problems were :

- a) Given a sorted array that has been rotated, find the index upto which array is sorted.

For ex : 3 4 5 6 1 2, the answer would be 3, because index of element 6 is 3.

- b) Given an array of numbers, find the largest product of three numbers in the array

We were expected to code our solution, write the approach, time complexity and test cases.

For the first problem, they expected a O(log n) solution, where n is the size of the array.

For the latter, they primarily wanted to check if the applicant accounted for negative numbers in the array and that the product could either be of three positive numbers or two negative and one positive number.

4. **F2F interview I** – Few theory based questions like abstraction in C++, volatile keyword.

Was given a problem – “Given an array of numbers, write a function that returns a balanced binary tree”. He also asked me to modify it to return a binary tree that is as close to symmetric as possible.

5. **F2F interview II** – Was first given a simple pattern printing problem – for example, if 16 is given, to print :

16 11 6 1 -4 1 6 11 16

If input was 10

10 5 0 5 10

The challenge was to not declare any variables or use any loops. Gave a simple recursive function that used stack implicitly to print the pattern. He was satisfied.

Second problem was, given two sorted arrays, to merge them in linear time and without using extra space, i.e, given an array with enough extra space to hold a second array and a second array, both of them sorted, to merge second into first and return it in O(m+n) time and O(1) space complexity, where m is size of first and n is size of second array.

6. **F2F interview III** – This was partly a HR interview too, where we discussed Microsoft and its services/ work culture / competition.

The only problem was given a dictionary of all words, to print all sets of anagrams together, in time linear to the number of words in the dictionary.

The interviews were really thought provoking and the interviewers were helpful and friendly. It felt like solving problems as a team and not at all like a test. The interviewers were quite receptive to our questions and patient.

About 70 people wrote the online MCQ round and about 30 made it to coding round. Some were called for interview directly and some had to go through group fly. Most of the candidates selected were those who went through group fly.

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## GATE CS Corner Company Wise Coding Practice

Position : SDE BING TEAM

**1. Online round :**

This was for screening and had 2 questions:

- i) max sum product of an array -> (take care of negative no.)
- ii) Bridge building problem across cities.

**2. F-F round 1**

- i) interviewer asked me why microsoft and why bing.
- ii) reverse linked list in size of k
- iii) design question on array of finding an element in an infinite array
- iv) search element in a pivot and sorted array.

**3. F-F Round 2**

- i) same question why microsoft and some project of current company
- ii) if 2 diagonally opposite coordinates are given of a rectangle, tell where they overlap or not.
- iii) find longest substring without repeated character

**4. F-F Round 3**

- i) why bing ? what do you know about bing?
- ii) design how will you implement the most viewed bar in bing search, different approaches
- iii) how to merge 2 unsorted arrays .(gave 3 solutions with complexity )

**5. F-F Round 4 (AA round :- as appropriate )**

- i) discussion started with my college and studies and grades.
- ii) moved on to how bing can scale up to google ? can it defeat
- iii) what's the probability that it can defeat google.
- iv) What are new features that can be implemented
- v) views on bing fighting google.

Thanks a lot geeks for geeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 68 (For SDE)

Hi, Following is my interview experience for SDE position in Bing Team.

**- Online Round :**

**Total questions 2.**

1. The question was big, like a story but it ultimately boils down to Longest Common Subsequence.
2. Don't remember the question but it was a mix of level order traversal + searching.

**- Onsite : Round 1 : Duration around 1 hour**

1. Given a binary tree, connect all node in the same level. Node structure is : left, right, data, next. Each level next should point to the next right node in the level.  
For last node in each level, next should be NULL
  - Then, the question was extended : Toggle the linking every K level. Means, you will be given a tree root node and a number K. For first K level, you should link to next right node. Next K you should link to next left and so on.
2. Given a city containing n people, a mayor candidate is one who does not like anybody but everybody else likes him. You are given a function Likes(x,y), where x and y are people in the city.
  - Likes(x,y) = 1 if x likes y, 0 otherwise.
  - Question was to find the mayor candidate. O(n) solution was required.
3. Some discussion on app based taxi booking services, overall idea about how they are implemented, how it can be improved. Just general idea.

**- Onsite : Round 2 :**

1. Discussion about MTech project, previous work, my contribution etc.
2. What could you have done better in the last round?
3. How can you transfer a binary tree from one machine to another. How will you dump it efficiently in a file. How you will encode and decode it. Long discussion of different approaches.
4. Designing a parking lot system, how will you design the databases etc.
5. Reverse every alternate quarter of a linked list. For example, if the list has 12 nodes, then 1-2-3, 7-8-9 should be reversed, rest remains same. Code with all edge cases checked required. Test cases for the same.

**- Onsite : Round 3:**

1. Discussion about previous work. Challenges faced.
2. Given a 2 D array of size mxn (say) and a location (i,j), write a function TraverseSpiral(arr,m,n, i, j) which will traverse the array spirally starting from location and

moving clockwise.

Working code with edge cases checked required.

Test cases for the same

3. Stream of words are coming : ate, geek, tea, for, sam, eat. Build a data structure to store these such that, if a query was made to search a word: sat tea, it should return all the anagrams : tea, ate, eat present in the store. Long discussion on possible approaches.

#### - Onsite Round 4: With Bing team GM

1. Long discussion about dissertation, previous work. With stress given to contribution and challenges faced and how did I decided to resolve them
2. Why do I want to leave present company?
3. Some discussion about UI, what are the things to keep in mind while designing a mobile APP like amazon or flipkart. Which is better among them. What would you like to do to make them more user friendly.
4. Some discussion about multi thread system and synchronisation among them. Various approaches and their trade-off discussed.
5. High level discussion on how India Railway reservation system works catering to millions of request at a time.
6. Any questions from my side – I asked various aspects of work being done in Bing team. I emphasised on scenarios where a bing search gives more relevant results than a google search.

Overall, it was a great experience. Great food and snacks throughout the day. The interviewers were friendly, giving hints and all. I would also like to thank geeksforgeeks for being there always. I have been greatly benefited hence I am taking time in sharing a detailed and thorough description of the process from my perspective.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 67 (On-Campus for Internship)

Microsoft had come to my campus for recruitment for both IT and IDC. Few selected students were given a preference between them. If they didn't qualify in one, they could go to the Other. I had chosen Microsoft IDC.

### First Round:

It was conducted in cocubes.com. comprise of c,c++ and one java and one aptitude question.

around 200 people were shortlisted for second round.

### Second Round:

Two questions were asked.

1) Given two arrays were digits of one array represent a number,maxmize the number by replacing it with elements of second array.

eg:

arr={3,1,4,5,6}

rep={1,9,5,2,3}

after replacement

arr={9,4,4,5,6}

one digit of rep can be used to replace only once.

2)convert the leaves of a binary tree to a linklist using its right pointer.(in place)

I had solved both and was selected to the next round along with 29 others

### Round three

Find all substrings of a given string.

space can also be part of the substring

I had topped this round giving the most efficient solution.

### Round four: (Face to face)

All contestant were asked the same question.

1)<http://www.geeksforgeeks.org/search-in-row-wise-and-column-wise-sorted-matrix/>

i gave the answer but was asked to justify my approach and was also asked to code in another approach. There were several questions asked to know the various approaches it can be done in.

2)find sum pair in a sorted array.

Again, i was asked questions regarding my approach

### Round 5

Three of us were taken to a room. we were asked to code a DFA which checks the correctness of grammar of a sentence in C. The mentor was very helpful and friendly.

### Round 6

HR round. Normal HR question like why should Microsoft hire you? etc.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

### Microsoft IDC Interview Experience | Set 66 (On-Campus for Internship)

There were 4 rounds in all

#### First Round

There were total 15 MCQ questions based on c, c++ pointers java output and one was on resource allocation graph. This round was on cocubes

#### Second Round

Around 60 people were selected and there were two coding questions

1. In a given array find i & j such that  $arr[j] > arr[i]$  and  $j-i$  is maximum
2. In a binary tree find product of all sum of values in a leaf node at same level

This round was again on cocubes

#### Third Round

Around 35 people were selected two questions were asked

1. In a BST two node values are swapped . Restore original BST
2. Given a sorted array find pairs such that their sum is closest to the given value

This one was on pen paper

#### Fourth Round

Around 20 people were selected for it

There was a single question it was expected to write code on a paper

Given a number find next bigger number by permuting its digits

After i solved this interviewer asked me to modify my algorithm for negative numbers

#### Final Round

There were 15 people

Interviewer questioned every one personally

Here are the few questions

1. Given a stream of running characters you have to identify anagrams and store only unique strings in a file
2. Given inorder and preorder traversals construct BT
3. Link-list is given it contains red, blue and green balls only sort it in place

Then some general questions were asked. Interviewer asked us to ask him something about microsoft and what will be work etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 65 (On-Campus for Internship IT and IDC)

Microsoft visited our campus for hiring FTE's and Interns. I had opted for both Microsoft IT and IDC. The first couple of rounds were online rounds and were hosted on Cocubes.com

#### Round 1

It comprised of 15 MCQ Questions and time allotted was 30 mins. Every student had a unique set of questions which comprised of C,C++ (I/O), Data Structures, Java, and Aptitude. The questions required a decent amount of thinking.

#### Round 2 (Online Coding)

1. You are given a matrix of dimensions  $m \times n$  where each cell in the matrix can have values 0,1 or 2 which has the following meaning :

0:empty cell

1:cells have fresh oranges

2:cells have rotten oranges

So we have to determine what is the minimum time required so that all the oranges will be rotten. A rotten orange at index  $[i,j]$  can rot other fresh orange at indexes  $[i+1,j]$  , $[i,j+1]$  , $[i-1,j]$  , $[i,j-1]$ . If it is impossible to rot every orange then simply return -1.

This was to be done without allocating any extra space.

2. Connect all leaf nodes of a binary tree to make a LL. (Without allocating any extra space for the linked list).

**Now, around 30 students were shortlisted for Microsoft IT and around 40 for IDC. There were some people who got short listed for both. I was lucky enough to sit for both of them.**

**From here I will write the processes for IDC and IT separately.**

#### FOR IT

##### Round 3(Group Fly Round)

Some people who had a high score in the 1st and 2nd rounds did not have to appear this round. They were promoted for the next rounds.

There were two questions.

1. Given a string (Assume that its case insensitive and has no spaces), find the length of the largest palindromic substring.

While the brute force solution would have  $O(n^2)$  complexity, with some thinking you can arrive at a  $O(n^2)$  solution.

2. Given a string , return the length of the longest substring which comprises of consecutive characters.

Ex: aboxy

Output:

3

abc

Discuss your approach with your mentors and be very clear about it. Write comments on the paper code.

#### Round 4 (Technical PI)

The interviewer was nice and made me feel extremely confident. He went through my resume and asked me a few basic questions on data structures that we use. Also know the efficiency of using each data structure and there pros and cons.

He first asked me to write a code to implement the "Evaluate Function" of Microsoft Excel. I gave him the solution where we convert the expression from infix to postfix and then evaluate the postfix expression. However, I was aware that this solution would not work for 2 digit number (or results). So I suggested an improvement by taking input as a string and then converting the string into an integer. The interviewer was satisfied with the logic.

He then asked me if I knew anything about encryption. Though I didn't have a very clear idea but I told him about some ciphers that can be used.

I had only one project on my resume. We had a 15 minute discussion of the challenges faced in making it and how it could be further improved.

The interview lasted for around 40-45 mins.

#### Round 5 (As Appropriate AA)

Now people who did relatively well in the previous technical round qualified for this.

The interviewer was again very warm. Though my CGPA was high, it kept decreasing every semester. He asked me the reason for this.

Then we discussed about my experience and work at one of the earlier places that I had interned. And he asked a few other questions like "Why Microsoft? " and "What I can do to improve Microsoft?".

Just be honest and confident about what you speak. And this round should go smooth.

#### FOR IDC

It followed a very similar structure like the IT interviews. The interviews here focused more on coding and databases. There were two Technical PI rounds instead of one after the group fly round.

The question tested the fundamentals and data structures.

There was a question on implementing a data structure to store a word along with all of its acronyms from a dictionary such that we can search it efficiently.

Thanks to GeeksforGeeks for building such a repository. I have learned a lot from this forum in the last one year. Awesome platform. And I would urge others who gain from this platform to contribute their experiences as well.

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

## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 64 (For SDE-2)

First Round (F2F) 1 hour:

Write code for below 2 qns , not exact but concepts are 99% same.

<http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/>

<http://www.geeksforgeeks.org/find-number-of-islands/>

Second Round (F2F) 1.5+ hour(Design round):

Asked me to design a URL shortening site like bitly. After few discussions i gave a soln like below method

<http://www.geeksforgeeks.org/how-to-design-a-tiny-url-or-url-shortener/>

Then there was lots of related questions of hashing , what to do to make it scalable, Design the server side.

But i didn't had any WEB experience so i could not give proper answers for them how ever i tried answering all questions and told them that these are my ideas how ever i don't ave any web experience so answers may be wrong .

Third Round (F2F) 1.5 hour+(Design round):

Started with what are the things you will consider for scheduling a meeting with say 5 -6 persons .

What are the things you will consider .

Prioritize each of them . Then for each person you have these inputs .

based on that find out best possible time slots for scheduling a meeting .

Also give priority to each of the slots .

Then questions on that .

other questions of why you want to join how u will cope up with the works which are different than the work you are doing .

Fourth Round (F2F) Hiring Manager – 15-20 mins:

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Questions on why you want to join how you will work then below question .

<http://www.geeksforgeeks.org/largest-sum-contiguous-subarray/>

I had justify lot of questions on why i want to change the domain after spending considerable amount of time etc,..

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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### Microsoft Interview Experience | Set 63 (For Internship)

This is my first time writing an article so here goes. Microsoft came to our campus yesterday. I sat for both the IDC and IT process.

#### Round 1:

It was an MCQ round, 15-20 questions. Mostly recursive questions, some aptitude and I/O.

#### Round 2:

Online coding i got two questions.

1. Window of k size in arr of size n, find all distinct element counts in those windows.
2. Connect all leaf nodes of a binary tree to make a LL. ( Don't allocate any memory just set the right child pointer as next node)

#### Round 3:

Group Fly round.

We got two questions:

1. Length of longest palindromic substring in a string. I got an  $O(n^2)$  solution. Mentor asked me to optimize i tried but i couldn't.
2. Merge two sorted arrays. Optimized from  $O(n)$  extra space to  $O(1)$  to no extra space.

Write all your approaches on the sheet even the pseudo code towards the end. Write comments.

Discuss with mentor. He should know who you are. Indent and write neatly.

#### Round 4:

Technical Interview.

OS questions.

1. Insert in a BST.
2. Find element in BST closest to k.

Some threading and java questions.

Be confident. Interviewer wasn't responsive.

#### Round 5:

Technical Interview.

Basic DS questions, asked me what has been taught what has not been taught, what you know and what not. I told him i have done heaps also so he asked me basics of heap.

Next question proper code he wanted for finding 2nd largest element in array was helpful and wanted me to check edge cases and fix. I missed one and i thought i wouldn't get through.

They understand your code easily so don't think they will miss anything.

PLEASE INDENT. I wasn't doing it initially so he was confused.

Asked about OOP and basics and stuff. I answered explained everything with examples. Run time polymorphism, Inheritance, encapsulation and stuff.

#### Round 6:

HR Interview.

Best round ever. The person was really very nice and frank. Loved every bit of interaction. Gave puzzles like hour minute angle difference, some tricky ones like how many points lie west of north pole (Answer is none) since there is nothing there.

Asked me to implement a scalable device which can incorporate additional shapes later on. The device would output a shape on a matrix if input is shape name. He pushed me towards a hash table approach with  $O(1)$  lookup and the table containing the coordinates for matrix traversal.

Ultimately he offered me an internship in MS IDC.

I was offered an internship along with 4 others.

I sat through the MS IT procedure before IDC, the interviewer wasn't very nice and made me feel demotivated. When i found an error in the solution he was trying to give me he was impressed. So be on your toes. Try and solve both questions in 2nd round as i was offered a bypass in IT. I skipped round 3 with 7 others.

I want to thanks Geeksforgeeks for everything. Every minute of my last few weeks was just GFG. It was an amazing feeling to get an internship.

Thanks a lot GFG! Amazing platform. Amazing articles.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

# Microsoft Interview Experience | Set 62 (On-Campus for IDC)

Microsoft visited our Campus recently for IDC as well as IT Profiles.

### Round 1 (MCQ):

It was an Online MCQ Round. There were 15 Questions in all. Time Duration was 30 Minutes. The Questions were mainly focused on C, C++ and JAVA. Only 1 Aptitude Question was there. There were different sets for different students.

Around 60-65 students were shortlisted.

### Round 2 (Online Coding):

Round 2 was held on the same day. It was Online Coding Round. There were 2 Problems.

1. Given a Binary Tree. Create a Linked List of all the Leaf Nodes of the Tree using the Right Pointer of the Tree Node as the Next Pointer of the Linked List Node. Return the Head Pointer of the Linked List. We were not supposed to use any extra memory.
2. Given an array of Numbers and an integer K. Find the total number of Distinct Elements in the contiguous sub-arrays of size K each.

13 were shortlisted after this Round for the Interviews. While some 25-26 were shortlisted for an additional GROUP FLY Round. I was selected directly for the Interviews.

### Round 3 (Group Fly Round):

I was selected directly for the Interviews from Round 2.

### Round 4 (Technical Interview 1):

The Interviewer was quite friendly. He tried to make the environment comfortable for me. This round went on for around 1 hour and 40 minutes.

1. Tell me something about yourself.
2. Given a Binary Tree. Find the maximum width of the Tree. I told him that I will use Level Order Traversal approach, keeping the track of the level. He asked me to think of another approach. So I told him that I will store the Tree Data in an Array and the Left View of the Tree in another Array. After this, I will count the number of members between the two consecutive elements of the Left View Array. Then he moved on to the next question.

### Round 5 (Technical Interview 2):

I was called for the Second Interview after half an hour. The Interviewer was quite friendly again.

1. She asked me to explain my Project. We had a long discussion on the Project.
2. Given an n-digit Number and a number k. You have to remove 'k' digits from the Number and give the shortest number from the remaining 'n-k' digits such that the sequence of digits remains same. For example, if the number is 637824 and k = 3. So you have to remove 3 digits from the given number. The number formed from the remaining digits should be the smallest possible and the sequence of digits must not be changed. So the output should be 324. I gave her an approach. But it failed. Then I used Dynamic Programming for this (Longest Bitonic Subsequence Concept). This Interview went on for 2 Hours and 15 Minutes approx.

### Round 6 (HR Interview 1):

I was called within 2 minutes of my last interview for this Round. He asked me in which Programming Language I am comfortable. I said C. So he asked me a very basic question on Preprocessors. I told him the answer. But he told me that it is wrong. Basically, he was trying to check my confidence. But I remained with my answer and explained him how I got it. He smiled.

Then he asked me a question to check my Problem Solving ability. Given a soft copy of a Dictionary. You have to print all the unique subsets of the Anagrams together. Unique means that {eat, tea, ate} should appear only once. I gave him many approaches but he wanted the approach from a layman point of view. We discussed on this single question for 50-55 minutes. Then he gave me the statement 'I am not very happy with your Problem Solving Ability'. But that was just to make me feel nervous.

Then he asked me the 3 Switch 3 Bulb Puzzle. I answered it. Then he asked me the Preferred Profile – IT or IDC. We had a discussion on this.

PS: Be honest with the Interviewer. Be open and ask questions.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

# Microsoft Interview Experience | Set 61 (On-Campus for IDC)

Microsoft visited our campus recently.

### **Round 1: (MCQ) 30min.**

It was an online round with 15 MCQ and time given was 30 min. The round was hosted on cocubes.com Questions were mainly from C,C++,Java,OS.

Around 60 people were shortlisted in this round.

### **Round 2 : (Coding) 60 min**

This round was also hosted on cocubes.com and had two programming questions.

- Given an array of size n and an integer k we need to return the sum of count of all distinct numbers in a window of size k. The window slides forward.

e.g. arr[] = {1,2,1,3,4,2,3};

Let k = 4.

The first window is {1,2,1,3}, count of distinct numbers is 2....(1 is repeated)

The second window is {2,1,3,4} count of distinct numbers is 4

The third window is {1,3,4,2} count of distinct numbers is 4

The fourth window is {3,4,2,3} count of distinct numbers is 2

Hence sum is  $2+4+4+2 = 12$ .

It was also given that the array elements are between 0 to 100.

- Given a binary tree we need to make linked list out of the leaf nodes. Constraints were that it was supposed to be done using O(1) extra space. Also we can use node->right pointer to connect the linked list.

Around 30 people were shortlisted from this round.

### **Group Fly Round:**

- Given a linked list, Reverse it in k-chunks.

<http://www.geeksforgeeks.org/reverse-a-list-in-groups-of-given-size/>

Around 12 students were shortlisted in this round.

### **Personal Interview Round 1: (45 min)**

- Given an infinite stream of binary digits (0,1) and an input number n, determine if at any point the number is divisible by n.

I found the question actually tough... I first solved for some specific cases like n = 2 and n = 3. Then by discussions with interviewers I was guided towards DFA Based Division.

<http://www.geeksforgeeks.org/dfa-based-division/>

Complete code was required in this round. To solve this one it took nearly 30 min with discussion.

- Assume you are manufacturer of a pen, what all parameters will you check to test a pen.

- Continuing above how will you test the address bar in a Browser.

Both these questions were open ended. He just wanted to see how many cases I can think of.

### **Personal Interview Round 2: (60 min)**

- Print a matrix spirally.

<http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>.

He then added further constraints such that if I want to print the matrix in a spiral way in clockwise and anti-clockwise sense. Also he added the constraint that he can start at any corner of the matrix. Detailed discussion on my approach was done. He was actually happy with the way I approached the solution.

### **Personal Interview Round 3: (60 min)**

- Detailed discussion on my Machine Learning Project which I had done in my internship.

- Given an integer write a function to convert it into a string.

- Given a string replace all spaces with '%20'

Took some time to solve this one but managed to solve it completely. He wanted me to check all the base cases.

### **HR Round :**

- Normal HR questions.

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## **GATE CS Corner Company Wise Coding Practice**

# Microsoft Interview Experience | Set 60 (On-Campus for Internship)

Microsoft came to our campus. Branches eligible was CS and IT. There were a total of 4 rounds.

## Round 1: MCQ round

In this round there were a total of 15 MCQ's and the time allotted was 30 mins. The questions were mainly from C/C++/Java output finding, pointers and references and basic puzzles.

I was able to solve 12 + mcq's. I managed to qualify this round.

## Round 2: ONLINE CODING ROUND

In this round 2 coding questions were given to us which need to be solved in 1hr time.

1st question:

You are given a matrix of dimensions  $m \times n$  where each cell in the matrix can have values 0, 1 or 2 which has the following meaning :

0:empty cell

1:cells have fresh oranges

2:cells have rotten oranges

So we have to determine what is the minimum time required so that all the oranges will be rotten. A rotten orange at index  $[i, j]$  can rot other fresh orange at indexes  $[i+1, j]$ ,  $[i, j+1]$ ,  $[i-1, j]$ ,  $[i, j-1]$ . If it is impossible to rot every orange then simply return -1;

2nd question:

You are provided with a binary tree and given two integers  $n$  and  $k$ . You have to determine sum of data of all the nodes which are at a distance of  $k$  from the node which has data  $n$ .

I managed to solve question no. 2 completely . Both using BFS. Here is my way of how I did it:-

1. Use BFS directly to traverse the array once and can obtain the solution in  $O(n^2)$  only.
2. Form a graph out of the tree with the found node as the source point and then do BFS Sum to find the required answer.

## Round 3: Face To Face Interview Round(150 mins)

1. A brief discussion on my projects.(About 2048 game in JAVA and some other projects I did.)

2. To tell something about me and elaborate my hobbies .

3. List of stations and distances between them are given and find all pairs shortest distance.(Floyd warshall algorithm in  $O(V^3)$ .)

4. Given 1 billion numbers.Remove duplicates in  $O(n)$  and the range of numbers are till  $10^5$ . (I used  $A[abs(A[i])]$  method to change sign and remove. It impressed the interviewer a lot.)

5. Implement Dictionary(I asked about the basic layout and was told that lot of words have been already entered each having its definition,synonyms and antonyms).(I started from vector < vector< string > , then HashMap, then Set <string,pair > and then RB Tree approach too.)

6.I was asked to write the pseudo code for each of the above data structures and their complexities of search,insertion and updation.

-I gave all the answers in this round .

## Round 4: Technical Round(90 mins)

1.I was asked to throw some light on some trending technologies.(I explained about Cloud,Big Data etc.) It took 30 mins and he looked impressed.

2. Next I was asked that if I were placed at IDC or IT then which one I will prefer and why. It was interactive session and finally I opted for MSIT mentioning him the reasons and he gave his final feedback on me.

-I gave all the answers in this round .

Hope my experience helps everyone.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

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# Microsoft Interview Experience | Set 59 (On-Campus)

Microsoft came to our campus. Branches eligible was CS and IT. There were a total of 5 rounds (and 1 additional group fly round).

## Round 1: MCQ round

In this round there were a total of 15 MCQ's and the time allotted was 30 mins. The questions were mainly from C/C++/Java output finding, pointers and references and basic puzzles.

I was able to solve 8-9 mcq's. Luckily I managed to qualify this round .

## Round 2: ONLINE CODING ROUND

In this round 2 coding questions were given to us which need to be solved in 1hr time.

1st question:

You are given a matrix of dimensions  $m \times n$  where each cell in the matrix can have values 0, 1 or 2 which has the following meaning :

0:empty cell

1:cells have fresh oranges

2:cells have rotten oranges

so we have to determine what is the minimum time required so that all the oranges will be rotten. A rotten orange at index  $[i, j]$  can rot other fresh orange at indexes  $[i+1, j]$

,[i,j+1] ,[i-1,j] ,[i,j-1] .If it is impossible to rot every orange then simply return -1;

2nd question:

You are provided with a binary tree and given two integers n and k. You have to determine sum of data of all the nodes which are at a distance of k from the node which has data n.

I managed to solve question no. 2 completely and in question no. 1 segmentation fault came.

#### **GROUP FLY ROUND(ADDITIONAL) :**

The question given to each and every candidate was to design the user interface of Indian Railways website .

#### **Round 3: Technical round**

1. A brief discussion on my project.
2. How will you test a parachute ?
3. Real life situation -suppose you have developed a software and you have delivered it to some of your client .If your client is facing some problem with the software then how will you solve the issue.Discussion on it.
4. Given 1 billion numbers.Find the median of these numbers -i gave min & max heap soln , $O(n)$  median finding algorithm soln. Then he asked me to explain the median finding algo to a layman .I gave sorting soln.
5. One simple SQL query- given a table containing employee id,manager id,city and employee name.The manager himself is an employee who has an entry in the table. You have to print the details of the employee whose managers city is same as his city .
6. Questions related to DBMS-Normalisation,Denormalisation,Indexing structures etc.
7. Difference between object based and object oriented programming language.
8. Some other problems which i dont remember.

#### **Round 4: Technical Round**

1. Explain polymorphism to a layman-I explained with example of the word-bat
2. Under what circumstances we go for array and when we go for linked list.
3. Practical use of stack data structure.
4. Implement Push and pop functions in stack using linked list.
5. Given a number n you have to print all squares of number from 1 to n.  
Ex-say n=5  
output: 1 4 9 16 25  
first I gave  $O(N^2)$  soln then He asked me to give  $O(n)$  soln-I did it .
6. Given a string .Find the maximum palindrome substring in the given string. I told him I have 3 solns for it -dp soln,find longest palindrome at every index soln,using suffix tree.He asked me to explain dp soln and to tell him best and worst case for it ?
7. Questions on why I used free() to free a memory allocated via malloc- questions related to garbage collection, single and double pointer,pointer as reference and pointer by value etc.
8. Then he asked a riddle-given three opaque containers and you have 3 labels on them.1 has label "mangoes" 2nd has label "Apple" and 3rd has label "Mango+Apple". You are told that every label is wrong. You can open any container from top and can see content inside it by not every item-means if you open container having apple+mango in actual you may see only apple or mango or both.So which box you will open to correct all the labels.You can open only 1 container from the top and see its content.
- 9.Discussion related to my project-I have made a rail reservation system using HTML+php+CSS .So he asked what is in your project so that visitors will visit your site instead of Indian Railways site.Discussion related to it.  
-I gave all the answers in this round :).

#### **Round 5: Technical Round**

1. Detailed discussion on my project.
2. Suppose you receive 1 million reservation requests at the same time and you have only 50 seats remaining to be allotted .how will you handle such situation. Long discussion on it. I gave him lots of solutions for it but he discarded all of them as there was some faults in every soln of mine. Finally I gave a soln using shared variable which stores no of seats available and the server spawns separate threads for separate requests. Then using a semaphore variable so that only 1 thread can access the shared variable at a time.He was convinced with the solution.
3. Given a number as input .Write a function which prints the number in string format .Ex-1234 will be written as "one thousand two hundred thirty four". I gave a hardcoded solution. He asked me if I can reduce the program length to 1/3rd. I told him that I can use a function to reduce the solution length. He didn't try to find bug in my solution. So he was ok with the solution of mine.
4. A lot more questions which i don't remember.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Microsoft

## **Microsoft Interview Experience | Set 58 (For Software Engineer)**

Microsoft Interview for Software Engineer Hyderabad.

Round 1: (1 hr)

- Given 3 sorted arrays. Find the common element of all the arrays in O(N) time and no extra space. If there is none, return false.
- Double linked list: 1 goes to the next node and 1 to the random node. Copy this list. Extra space can be used.

Round 2: (45 mins)

- Power of a number ( $x^{**n}$ ) in O(log N) time
- Given an array which has a duplicate except for 2 elements. Find them. We always have 2 such element.

Round 3: They said me a bye

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 57 (For SDE)

Round 1 (45 mins)

- There was a detailed discussion on the project i did at Microsoft and also over the two projects mentioned in my resume.
- There is a Bing log file containing the domain names. Design a cache memory system for faster dns look ups.(i suggested a Trie and a min heap based solution). I was asked to make it space efficient. (I replaced trie with map)
- There is a turn based 2 player game in which there are 9 pins and each player is allowed to pick either 1, 2 or 3 pins only. The last player to pick the pin is the loser. Design winning strategy for such a game.
- Generalize the above solution for n pins.

Round 2 (45 mins)

- There is a large file with system memory limitations. How will you store it (i suggested Distributed system) and how will u work on it.
- Suppose the large file contains name, address, Dob, pan no etc as attributes. Design class interface for such a system.The question was re framed again with more conditions which i am unable to recall now.
- There was a detailed discussion over how the stl map data structure is implemented.

3) Discussion over hashing and collision resolution techniques.

Round 3(40 mins)

Discussion over my project followed by these questions:

- Write the code to delete nodes in a binary tree which don't lie in any path from root to leaf with sum $\geq k$ .
- There is a rotated and pivoted array. Write the code to determine how many times the array is rotated. (i did it in O(log n)).

All thanks to geeks4geeks for helping me prepare for technical interviews.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 56 (For SDE 2)

First Round (F2F) 1 hour:

- Given an image with a lot of pixels, find all the pairs of pixels that are strongly connected.
- Given an N-ary tree with thousands of nodes, pair the leaf nodes which do NOT SHARE the common path. i.e. Two Leaves can be Paired only if they do NOT have a common edge that was used in a previous pairing.

For example,

```
A
 / \ \
B C D
 / / \ \
E F G H
```

Leaf nodes: E, F, G, H & D

Possible Pairs in O/Ps:

- a) (E-F), (G-H) or
- b) (E-G), (F-H) or
- c) (E-H), (F-G) or
- d) (E-D), (F-G) or
- e) (E-D), (G-H) or
- f) (E-D), (F-H) or
- g) (D-H), (F-G) or
- h) (D-G), (F-H) or

i) (D-F), (G-H)

Note: If we pair(join) say, (E-F) then we can NOT pair any of the (D-G) or (D-H) as they SHARE the COMMON path from A to C.

i.e. E-B-A-C-F  $\rightarrow$  (E-F) pair  
D-A-C-G  $\rightarrow$  (D-G) pair  
D-A-C-H  $\rightarrow$  (D-H) pair

So the above case is NOT possible

I tried using a couple of solutions.

Later on used Mathematical Induction (upon his hint)

Basically, a pairing for  $n = 2$  leaf nodes is true

Assume a pairing exists for  $n = 2k$  leaf nodes ( $k > 0$ )

Now you need to prove a pairing exists for  $n = 2k+2$  leaf nodes

So basically you just have to see the cases where you can insert the new nodes differently

I will probably try to contribute with an article on this.

Code was asked for both the questions.

Second Round (F2F) 45 mins – 1 hr:

1. Given a tree, and a pointer to some node in the tree, print the left most element in the same level as that node
2. Given a C-string, convert it into its ascii string. Ex: "CAR"  $\rightarrow$  "676582" (C-67, A-65, R-82)  
Conditions are that you have to write it in C and you have to do it in place.
3. Lots of questions on programs, Inter process communication, pthreads, java garbage collector etc that went for around 20 mins

Third Round (F2F) 1 hr :

1. Reverse k-alternate nodes in a Linked List
2. Given two strings s1 and s2, find if there exists a substring in s1 which contains an anagram of s2 (in O(n))
3. Given an input of the calendar objects of 10,000 microsoft employees, input is a time interval T and an employee[] array, find the first interval where all the employees in the employee[] array are free for a minimum time interval T (i.e schedule the meeting)

I did this question using B+ trees and a Hash, I was told that max flow algorithms can be used.

Fourth Round (F2F) Hiring Manager – 1 hr:

1. Project/previous work
2. Design whatsapp's back end systems: (we should be able to handle 1 million requests a second and transmit data with least latency)  
I had used a lot of distributed systems concepts like message queues, sharding, CDNs, monitoring, InnoDB/MongoDB etc

Preparing questions on Scalability and Distributed Systems is highly recommended.

This site helped me a ton and I hope others will find their dream jobs too !

Thanks geeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 55 (For Software Engineer 2)

### Skype round 1: (10 min)

Print a tree in zigzag order. For Example for the given input tree:-

```
1
2 3
4 5 6 7
```

The output would be:-

```
1
3 2
4 5 6 7
```

Code for the logic in any language that you are comfortable in.

### Skype Round 2: (10 min)

Find if two given strings are anagrams of each other or not.

Anagrams example: LISTEN and SILENT.

Code for the same. Test cases for the code. (Positive and negative)

They called me to Hyderabad for an F2F immediately after Skpe rounds, (I managed to postpone it to the next week).

## Face2Face Round 1: (45 min)

### Question 1:

Given a character array which each position is filled with either a single digit numbers or a comma,

Array of 22 characters:-

1	3	5	6	,	4	9	7	3	,	2	3	,	7	7	,	2	2	,	9	9	,	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Write a code to reply true if we find a set of three set of numbers separated by a comma such that

X , Y, Z and Z = X + Y

In the array above  $77+22 = 99$  so return true.Code for the same with negative test cases.

### Question 2:

If in a given Doubly Circular Linked List a couple of next pointers are corrupted, give the logic to rectify them all.

## Face2Face Round 2: (1 hour)

Given a number in an int variable, write a code print its value in words, covering all possible corner cases.

Ex → 34567 = thirty four thousand five hundred and sixty seven.

Negative test cases for the same.

## Face2Face Round 3: (1 hour 15 min)

### Question 1:

Given a scheduler arrangement with some jobs having unique job ids and every job id has a number of tasks with unique task ids for that job.

Example:-

```
Job id : 500 Task id : 700
Task id : 300
Task id : 350
Job id : 600 Task id : 400
Task id : 350
Task id : 600
Job id : 1000 Task id : 800
Task id : 100
Job id : 200 Task id : 650
```

Write a Code for listing the job ids + task id combination in round robin fashion.

Example:-

```
Job id : 500 Task id : 700
Job id : 600 Task id : 400
Job id : 1000 Task id : 800
Job id : 200 Task id : 650
Job id : 500 Task id : 300
Job id : 600 Task id : 350
Job id : 1000 Task id : 100
Job id : 500 Task id : 350
Job id : 600 Task id : 600
```

Choose any data structure of the input (array of structures or linked lists or queue).

Design Test cases for the same.

### Question 2:

Given a BST, create a Doubly Linked List from the same in place.

Tree node -> left pointer = DLL node -> previous pointer

Tree node -> right pointer = DLL node -> next pointer

## Face2Face Round 4: (with the Director) (1 hour approx)

He asked typical HR questions like

Why Microsoft?

Where do you yourself 10n years from now? Blah blah.

### Question 1:

Given a mess of 3 balls (colored red blue and white) write an algorithm + program with the most efficient way to sort them color wise. (Dutch National Flag Problem)

### Question 2:

Given a string print the string with alternate occurrences of any character dropped.

```
Example: input string → It is a long day Dear.
Output string → tisalondgyDea.
```

Modification:- Consider alphabets with both cases as same occurrence.

```
Output string → Itsalongdy ea.
```

Position was software Engineer 2. MSFT does not have SDE and SDET anymore, All roles shall be SE from now on.

Thank you geeks for geeks. This site is a Marvel for job aspirants.

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### Microsoft Interview Experience | Set 54 (For SDE)

#### Round 1 (45 mins):

Tell me about yourself.

1. Given an array of strings with **R**, **G** & **B** as characters. **Sort** the array such that all **R** comes first, followed by **Gs** & followed by **Bs**. Do it in **O(n)** time complexity.

#### (Paper Code)

For eg. array is:

I/P: **G G R B R B B G R B R**

O/P: **R R R R G G G B B B B**

**Hint:** Same problem as sorting strings of 0s, 1s & 2s.

Done using the same logic as that of sorting 0s, 1s & 2s in no time. Interviewer was happy. \*:) happy

2. Can you do the same above program using **Singly Linked List (SLL)** & **Doubly Linked List (DLL)** in **O(n)** time complexity.

Done it using DLL comfortably.

But using SLL I got stuck as we've to keep track of PREV pointer every time. He wanted it to be done in a SINGLE PASS if possible. Was not able to do this for SLL.

#### Round 2 (1.30 hrs):

Tell me about the projects you've worked on.

1. **Matrix Multiplication** of 2 matrices. Both of the matrices are **Distributed** across a cluster of nodes. And matrices are of huge size (**BigData**). How can you multiply these matrices efficiently. He wanted to know the approach only but not the actual code.

(He asked me this Distributed problem esp. as I've worked on **Apache Spark & Hadoop Distributed architecture** in my project. So he was very keen to check my knowledge in the Distributed & BigData domain.)

**Hint:** Think in terms of **MapReduce** jobs.

**My approach:** As we know that in matrix multiplication, ith row is multiplied with jth column, (i+1)th row is multiplied with (j+1)th column, & so on till (n-1)th row with (m-1)th column.

**Map** each ith row to jth column, (i+1)th row to (j+1)th column & so on till (n-1)th row to (m-1)th column.

The idea is to make **Keys as ROW index & Values as Column index**.

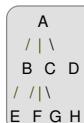
While doing the **Reduce** operation, Multiply the respective Rows & Columns using above Mapped Rows & Columns. B'coz generally in the Reduce operation of MapReduce jobs, Spark/Hadoop brings all of the mapped data into one Server to do the computation & stores the result. So in the Reduce operation, Spark/Hadoop will bring only the mapped Row & Column while doing the actual multiplication. We need NOT to bring all Rows & Columns data at once.

This was my approach. One can think of the other approach also & share their better approach too.

Laterally he asked me about MapReduce jobs in further details & asked me about Hadoop & Distributed architecture (NameNode, DataNode, etc.). Some questions on Scalability.

2. Given an **N-ary tree** with **thousands of nodes** in it. **Pair** (Join) the **Leaf nodes** which do **NOT SHARE** the common path. i.e. Two Leaves can be Paired only if they do NOT have **Intersecting path**.

For example,



**Leaf nodes:** E, F, G, H & D

**Possible Pairs in O/Ps:**

- a) (E-F), (G-H) or
- b) (E-G), (F-H) or
- c) (E-H), (F-G) or
- d) (E-D), (F-G) or
- e) (E-D), (G-H) or
- f) (E-D), (F-H) or
- g) (D-H), (F-G) or
- h) (D-G), (F-H) or
- i) (D-F), (G-H)

**Note:** If we pair(join) say, (E-F) then we can NOT pair any of the (D-G) or (D-H) as they SHARE the COMMON path from A to C.

i.e. E-B-A-C-F —> (E-F) pair

D-A-C-G —> (D-G) pair

D-A-C-H —> (D-H) pair

So the above case is **NOT** possible.

Also if there are **EVEN** number of Childs, then exactly n/2 pairs are possible. In case of **ODD** number of Childs, 1 of the Childs will be left **Unpaired**.

I've told him using **BFS** as it traverses each Edge exactly **ONCE**. The idea was while doing BFS traversal, Pair Childs of a Visiting node if both of their Childs are Leaf nodes.

If the Visiting node has only **ONE** Child (Left Child or Right Child only) then store this Child in the **TEMPORARY** array (Array of Pointers to the Childs).

Once the BFS traversal ends, Pair the remaining Childs in the **TEMPORARY** array one by one.

Again he was NOT satisfied as BFS works **LEVEL-WISE**. So he told me what if some of the nodes have **SKEWED** sub-tree with thousands of nodes.

I got stuck.

He told me to apply **Mathematical Induction**.

If we can prove for the Base Case that at least **2K** Childs can be Paired. Then we pair & prove it for **2K+2, 2k+4, , , , , 2K+n** Childs too.

I was Blank in MI concepts.

Was **NOT** able to solve this problem.

He was so impressed \*) happy with my 1st problem's approach using MapReduce. He was a little bit satisfied with the 2nd problem's approach. So I've been forwarded to 3rd round.

**Lunch time.** Sooooooo Good. Food was so good. Really liked it.

### Round 3 (50 mins):

He had quickly looked at my CV. Then he asked me to tell something about the projects that I've worked on & working on. As I've worked mostly on **Machine Learning** & **NLP** domain, he asked me few questions about **NLP**. How will you Scale your current project.

- Given a sentence, Reverse it **Word-by-Word**.

For example,

**I/P:** "Microsoft Azure is one of the best Cloud solutions"

**O/P:** "solutions Cloud best the of one is Azure Microsoft"

So easy. Given on GFG.

Done it in no time.

He asked me do it in a **SINGLE PASS**. As the solution requires **2 PASSES** of the sentence. (1st for reversing each individual word & 2nd for reversing WHOLE sentence).

Got stuck. Taken a long time to think about this. Couldn't able to do this. Finally he asked me another question.

- Detect a **Loop** in a **Singly Linked List**. \*) happy

Given the GFG approach. He was Happy.

- Remove** the Loop in above SLL.

Again given the same GFG solution.

I've been told to wait for the 4th & Final round.

### Round 4 (Design Round):

What do you know about **Cloud Computing**.

Do you know anything about **Microsoft Azure**.

Design a **WindowsBox** just like **DropBox** Cloud storage.

Provide all the services **IaaS, PaaS & SaaS** using **Service-Oriented Architecture (SOA)**.

Have given very Low-level design. NOT up to his expectations. As I've NOT worked on Cloud Technology earlier.

NOT able to perform well in this round.

#### Advise:

Prepare for the **Design** questions & **Scalability**.

One can go through this link: <https://www.quora.com/How-should-I-prepare-system-design-questions-for-Google-Facebook-Interview>

Watch out this video. Its very good.

They look for the basics of **Data Structures & Algorithms**. (esp. Linked Lists & Tree)

Lastly, GeeksForGeeks is the best source for all. GFG really helped me a lot in the preparation.

Thanks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 53

### Round 0 -

Second max element in BST

Sort an array of integers such that –

- All odd numbers are in left side and sorted in increasing order.
- all even numbers are sorted in decreasing order and start where odd numbers end.

Eg –

I/P – 2, 3, 4, 5, 8 , 10, 12, 11

O/P – 3, 5, 11, 12, 10, 8, 4, 2

I used quick sort partition logic to separate odd and even numbers and then ran quick sort on both halves.

#### Round 1 –

Assume an RAM of size 1024 bytes. There are multiple processes running on the system. Your application will get this information –

(Thread Id, Memory Block, time, R/W) – which essentially tells that the thread T was using memory block M at time t and operation could be read or write.

Memory conflict is defined as –

- Let x be standard unit of time measurement.
- Multiple read operations at the same location are not cause of conflict.
- One write operation between  $x+5$  to  $x-5$  to location M, will be cause of conflict for a thread accessing location M at time x.
- Example – If thread T1 accessed memory location M at time  $x+1$  and if a thread T2 accesses location M before time  $x+6$  then T1 and T2 are candidate of conflict given one of them do write operation.

You are given with the list of threads accessing memory locations, you have to find conflicts.

Example –

- (1, 512, 1, R)
- (2, 432, 2, W)
- (3, 512, 3, R)
- (4, 932, 4, R)
- (5, 512, 5, W)
- (6, 932, 6, R)
- (7, 835, 7, R)
- (8, 432, 8, R)

O/P –

Thread 1 & 3 conflicts with thread 5

All other operations are safe.

#### Round 2 –

<http://www.geeksforgeeks.org/turn-an-image-by-90-degree/>

Level order traversal ->

Using queue

Using recursion

#### Round 3 –

<http://stackoverflow.com/questions/746082/how-to-find-list-of-possible-words-from-a-letter-matrix-boggle-solver>

> My solution was mutation of this – <http://www.geeksforgeeks.org/mobile-numeric-keypad-problem/>

#### Round 4 –

3D boggle solver and 3D cross word solver.

Design data structure to store and give a solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 52 (Fresher)

### Round 1 (Microsoft College Code Competition)

There were 6 problems to be solved in 1h30, if I recall correctly. My team solved 3 of them and ended in 2nd place.

80 people from my university participated in the contest. Microsoft selected around 6 for the final interview round.

### Round 2 (Final interview, on-site)

3 interviews of 45min each, with 15min of interval in between. In these breaks, we talked to the recruiter. If you do okay in one of the interviews, but not great, you get one extra interview.

1) Run-length string encoding.

Link: <http://www.geeksforgeeks.org/run-length-encoding/>

However, there were additional restrictions:

- (a) resulting string shall be written to the input string.
- (b) maximum extra memory allowed is (length of string – 1) bytes.
- (c) if the resulting string will be longer than the input string, the algorithm can abort and leave the string dirty.

Behavioral: I was asked about my background.

2) Lowest common ancestor and Reverse words in string

Links: <http://www.geeksforgeeks.org/lowest-common-ancestor-binary-tree-set-1/>  
<http://www.geeksforgeeks.org/reverse-words-in-a-given-string/>

Behavioral: talk about the most interesting project, and what I learned from it.

3) Given a list of events with start time and end time, find the events which have conflict with any other.

How would I decide which feature should be implemented next in an operating system.

Behavioral: talk about my favorite project and one instance where I had to convince other people,

**Additional comments:**

1. Overall experience was pretty nice. Microsoft paid for all expenses for us to visit their office. The recruiter looked after us as well, really no complaints.

2. Two of the interviewers were very down to earth, despite all their experience and high positions. Conversation with them flowed naturally, and I had a great time.

3. One of them (from question #1), however, had a very bad attitude toward the candidates. He didn't study the problem well enough to assess solutions that weren't similar to his, and made disrespectful comments about our ideas to solve the problem in our own way. This is not just my opinion, as I also asked other candidates.

I perfect'd interview 2, did good in interview 3, but was not good enough in interview 1 (for the reasons already stated). I was not given an offer then.

What I can say is: no matter how well you prepare, you still rely on the interviewers. Study hard and hope to get interviewers that are nice and don't want to lower you.

Good luck to you all.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

# Microsoft Interview Experience | Set 51 (For SDE Intern)

Recently Microsoft visited our campus for SDE intern. The process took over 4 months.

### Round 1 (Online MCQ's)

Time-30 mins

This round consisted of 25 questions on C,C++,Aptitude(Probability) and OS.

60 students out of 150 were shortlisted for the next round.

### Round 2 ( Online Coding Round)

Time-90mins

1) Write a function to check whether the string is valid or not.(Check Balanced Parenthesis{},[],{}).

/\*header Stack.h was added in C++/\*

<http://www.geeksforgeeks.org/archives/6547>

2) Write a recursive function to form a list containing intersection of two given linked list without creating new nodes.

<http://www.geeksforgeeks.org/intersection-of-two-sorted-linked-lists/>

<http://www.geeksforgeeks.org/union-and-intersection-of-two-linked-lists/>

Students who solved both the questions were selected and some who solved one question were selected too.

37 students were shorlisted for the next round.

### Round 3 (Telephonic interview)

Time-27 Min

-Firstly , the interviewer introduced himself. Then asked me to do the same.He asked to me bring a pen and a paper.

-He asked me to briefly describe everything I had written in my resume.

-Questions on my project

-Random Funtion

-Questions on Sql and Oracle

-What difficulties I faced during my project

-Asked me to whether I would like to answer Question on DS or puzzles.I said both.

-DS

-Height of tree in O(n).

- Find the minimum level where leaf node is found.

-When would height of tree and minimum level leaf node be equal.

-What is a height balanced tree.

-Puzzle

-Given a tray of red and blue balls.Separate red on left and blue on right with minimum swaps.

-Solve the same with Red, blue and green balls.(traversing only once!)

Only 9 were shortlisted for the further interviews. I was lucky enough to be one of them.

We were called to Microsoft India Development Center, Hyderabad. There were total 23 students from IIT indore, IIT hyderabad,

IIT hyderabad and some other institutes.

There were 3 f2f interviews.

### Round 4 (Technical) (30 mins)

1)Resume discussion.

2)Write an algorithm to merge two sorted linked list in place.I wrote an algorithm then he asked me to

-do it without using double pointer.

-without a dummy node

-asked me how would i test my solution.

-all possible test cases and how would my code respond to them.

<http://www.geeksforgeeks.org/merge-two-sorted-linked-lists/>

General discussion about project.

\*Simplest round!\*

Soon after the fourth round some of us were called for the next round.

#### Round 5 (Technical) (35 mins)

1)Nodes at K distance from the root.He asked me to write the test cases. I wrote around 15.He was satisfied.

2) What is deadlock?

Conditions of deadlock.

Write a code to show deadlock.

Explain Bankers Algorithm.

3)Given a column number, find its corresponding Excel column name.

<http://www.geeksforgeeks.org/find-excel-column-name-given-number/>

He told me That i have good coding skills.

#### Round 6 (Was supposed to be HR but Technical!! ) (30 mins)

He asked me how my previous interviews went.

Asked me terms like

-Garbage collector

-Unicode

-Ascii etc.. (around 10!)

1)Given n (no. of elements of array){1,2,3,4,5,6,7,8} , K (no of elements in one row or column as specified)(eg. 3)

and A boolean variable Col & Row. When Col =True We have to print elements of array like-

1 4 7

2 5 8

3 6

And when row= True

1 2 3

4 5 6

7 8

2)Assume a computer screen.All the pixels are colored black. Given (x1,y1) and (x2,y2) you have to color the line joining these

two points Black.

(Hint:The line is not always going to be a diagonal straight line. Sometimes we may have to go vertically up and then sideways)

The interviewer was helpful and patient.

The experience was Grand! The people were so down to earth ! Every interview felt like a simple peer to peer conversation.

All i would suggest is Geeks For Geeks And u need Nothing to do ☺

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft interview Experience | Set 50

R1 Telephonic

1) Given a large int array, sort it. The ints are in the range 1-10.

2) In a 2-D array of 0's and 1's find the row with max 1's, given that the array is sorted row wise.

R2 F2F

1) Find the maximum contiguous sum in an array. Had to write test cases as well.

2) don't remember

R3 F2F

1) On a screen, there are multiple rectangles drawn, when a user clicks on any point, find the smallest rectangle enclosing this point.

2) Design poke feature in Facebook

R4 F2F

1) Implement file read operation asynchronously.

2) there are N large log files in sorted by timestamp. Merge them.

3) there are N large files containing operations sorted based on name to be done on an address book.

Address book is stored as name value pair in another file which is sorted based on name. Apply these operations and store in a new address file.

Had to write code and test cases for this.

R5 F2F (Hiring Manager)

1) some discussion on foreground and background thread.

2) What is common in 2 threads of the same process and what is the difference.

3) how would you communicate between 2 processes.

4) can we create connection between 2 processes similar to tcp connection.

- 5) difference between tcp and udp.
  - 6) are packets lost in tcp if network is never lost.
  - 7) create a macro for reversing an int in terms of byte e.g. an int has 4 bytes numbered 1234 the macro should return 4321.
  - 8) in a 2-D array of chars, if a user selects any 4 boxes, check if these are continuous or not. continuous boxes are those which lie in 3x3 sub array surrounding the box.
  - 9) design auto complete feature.
- Some other OS questions on threads only.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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### Microsoft interview Experience | Set 49 (For Internship)

Recently Microsoft visited our campus for SDE intern. The process took over 4 months.

#### Round 1 (Online MCQ's)

time- 30 minutes.

This was conducted on CoCubes.com ,there were around 25 questions of varying level of difficulty. Topics: C , C++ , Aptitude.

Around 60 students out of 150 were shortlisted for the next round.

#### Round 2 ( Online Coding Round)

time – 90 minutes

This was conducted on the same day. There were two questions of data structure.

- 1) Write a function to check whether the parenthesis ( “( )”, “[ ]” , “[ ]” ) in a given string are balanced or not.

<http://www.geeksforgeeks.org/archives/6547>

- 2) Write a recursive function to make a list from two given Linked lists, that contain intersection of the elements present in the given lists inplace.

37 students were shortlisted for the next round.

#### Round 3 (Telephonic interview)

time- 33 minutes

1. I was asked to introduce myself.

2. Then there were couple of questions on the project i was working on. As my project was in java as the front end and oracle as the back end, i was asked few questions on multithreading and sql.

3. I was then asked to explain the logic and the code to traverse a binary tree level by level but in spiral form.

<http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

4. Logic and the code for the lowest common ancestor in a binary search tree.

<http://www.geeksforgeeks.org/lowest-common-ancestor-in-a-binary-search-tree/>

5. Complexity of both the above codes and why such complexities.

6. i was asked questions on OS-

-Differentiate between mutex and semaphore variables?

- What does a thread and a process share in common?

- What is a deadlock ?

7. There were few questions on C++.

- Polymorphism and runtime polymorphism.

- What is a virtual destructor?

I was asked if i had any queries and i asked about the work that interns will get to do in microsoft and the interview ended.

Only 9 were shortlisted for the further interviews. I was lucky enough to be one of them.

We were called to Microsoft India Development Center, Hyderabad.

#### Round 4 (Technical)

Time- 35 mins

The interview started with my introduction. Then there was a long discussion on my project. He told me the flaws in my project and asked me to tell how would i deal with them.

- 1) Given two arrays of integers( in random order), how would u determine the rank of an element.

For ex: let the two arrays be

46 32 16 73 57 2 and

86 7 98 3 75

rank (46) = 6

rank (86) = 10

rank (2) = 1

i don't remember the exact question but it was similar to this. Fairly simple. I suggested some approaches and i was expected to come out with the best approach. then i was asked to code my solution and design the test cases for the same.

- 2) I was asked about my favorite subject.

3) Write and explain the code to connect nodes at same level in a binary tree.

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

Soon after the fourth round some of us were called for the next round.

#### **Round 5 (Technical) (30 mins)**

1) Given a Y-linked list. Find the node at the intersection point.

2) Given a string containing lower case letters and upper case characters. Find the number of occurrences of each character.

The question was further modified to include the special characters as well. I was asked to design the test cases for the same.

3) Remove duplicate characters from a given string keeping only the first occurrences (i.e. order should not change). For ex- if the input is 'bananas' the output will be 'bans'.

<http://www.geeksforgeeks.org/remove-all-duplicates-from-the-input-string/> (second method).

5 of us were called for the next round.

#### **Round 6 (HR) (30 mins)**

There were questions like-

1) Brief me about your academic history.

2) The project you are currently working on and why did you choose this?

3) What improvements can you do in your project? Are you working under a professor or just out of interest?

4) How would your peers describe you?

5) How would your professors describe you and what are your weaknesses according to them?

6) How are you trying to improve?

7) What keeps you motivated?

8) What are your Short term and Long term goals?

9) Why Microsoft?

There were few other questions which I can't recall now :p

It was the last round. It went pretty well.

The experience was awesome and I found that the people over there are very humble and I really liked their helping attitude.

#### **Some interview tips-**

Stay calm, CONFIDENT and keep yourself motivated.

Be honest.

Try to keep your approach clean and don't mess up things in your's as well as interviewer's mind.

Don't think about the results, just enjoy the interview process with a free mind ☺

Focus on building your concepts strong.

A big thanks to GeeksforGeeks for providing such a brilliant platform for interview preparation. Keep up the good work

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Microsoft

## **Microsoft interview Experience | Set 48 (For 1.5 Years Experienced)**

Here goes my experience.

#### **Skype Round:**

1) Level order traversal of a binary tree. Extend or modify the code to zig zag traversal.

<http://www.geeksforgeeks.org/level-order-tree-traversal/>

<http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

#### **Face to Face Round 1 :**

1) Questions about my previous work.

2) Sort an array of 0's, 1's, 2's.

<http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/>

#### **Face to Face Round 2 :**

1) Print last n lines of a file

<http://www.geeksforgeeks.org/print-last-10-lines-of-a-given-file/>

2) Right and Top view of a binary tree

<http://www.geeksforgeeks.org/print-right-view-binary-tree-2/>

<http://www.geeksforgeeks.org/print-nodes-top-view-binary-tree/>

#### **Face to Face Round 3 (Hiring Manager) :**

1) Questions about my previous company work and why would I want to shift.

2) Given a matrix which is spirally sorted. Remove an element and insert another element without messing up with the sorted order. More importance was given to coding

#### Face to Face Round 4 ( Bar Raiser ) :

1) Given an array filled up with 1 to n^2 in randomized order. Fill it in a square matrix of size n.

2) Give test cases for atoi function.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Microsoft

## Microsoft IDC interview Experience | Set 47 (For 1.7 Years Experienced)

For Microsoft Bangalore CRM team.

Experience: 1.7 years.

### Round 1:(Written test)

Question 1 : Given a binary search tree . Print its level order traversal in reverse order level wise .eg if level order is 1234567 then required output was 1327654

Question 2: Given a binary search tree , Print its zig zag traversal .

Complete syntactically correct code was required with all corner cases covered .

### Round-2(Technical)

He asked me to Introduce myself and then started asking me about my project

1. Print the given matrix in spiral order .

<http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>

Code should be syntactically correct with all corner cases handled in a single attempt.

2.Count all possible decodings of a given digit sequence .

<http://www.geeksforgeeks.org/count-possible-decodings-given-digit-sequence/>

Initially I started off with a recursive solution and came up with Dynamic programming solution afterwards. Full working code was required without any corner case missing.

He asked to list down all the possible test cases for the given scenario . He was very particular about the Test cases .

### Round-3(Technical)

He asked me to introduce myself.

1.He asked me about the current project which i m working on.. and a few questions on the technologies which were used in the project.He was very particular about my project discussion.

2. Given a linked list consisting of String in each Node . Given just a pointer to the head Node , I was required to find whether the resultant String formed by combining all the Nodes of the linked list is a palindrome or not .

eg – Consider this linked List structure

"aba" -> "cd" -> "efe" -> "d" -> "caba"

Hence this structure is palindrome . Was required to check for palindrome online as Linked List length could be infinite at any point of time .

I was required to discuss and write full code on the whiteboard starting from Node structure to the end logic .

After that i was required to list down Test Cases for the same .

### Round-4:(Technical)

He asked me to walk him through my resume.

1. Why Microsoft?

2. Why do u want to leave your current company?

3. Deep discussion on the current project which I'm working on.

4. Write code for the crossword puzzle game .I said I have not played it earlier .

He then asked me to discuss and write code for Sudoku game in whiteboard. I wrote it using Backtracking

<http://www.geeksforgeeks.org/backtracking-set-7-sudoku/>

5. Suggest some improvement which u can carry out in Microsoft Office .

### Round-5 (HR)

1.Discussion on current compensation etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 46 (Onsite)

I had my onsite rounds with Microsoft.

There were 4 interviews.

**Round 1.** Given a circular buffer, write Get( ) and Post( ) methods . Get(n) should return the n characters in the string, if 'n' elements are not present, it should throw an exception. Put( string s) should put each of the characters of string s into the buffer without overwriting anything which hasn't been read by Get()

**Round 2** Longest common substring from 2 given strings. As I couldn't give optimal solutions, asked me to write a strcmp(str1, str2) method

**Round 3** Write a secure and safe strcpy( ) method . Asked me some theoretical questions about indexing and triggers for sql

**Round 4** Write a program which generates XLS column numbers given the column number in decimal.

e.g.

**Input Output**  
1 A  
2 B  
26 Z  
27 AA  
52 AZ  
53 BA  
...

Good Luck to future interviewers

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 45

**Round 1:**

Written coding test:

Given a number in a linked list find the next greater permutation.

**Round 2:**

F2F 1:

With senior developer:

1. given an array. write a function to find if the array satisfies the condition min^2

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft IDC Interview Experience| Set 44

I recently got an internship offer from Microsoft IDC and would like to share my interview experience. It's a little long because I'm sharing my experience, not just the questions.

**First round (Online):** This was common for both Microsoft IT and IDC. There were 2 coding questions (1 hour) and 20 MCQs (30 minutes). MCQs were mostly based on data structures, C/C++ and a few on OS. In the coding questions we were given the main function, we just had to fill in the code for the functions.

Coding Question 1: Find the point of intersection of two linked lists. (Bonus points for checking if the given linked lists are circular)

Coding Question 2: Given a matrix which consists of 1's and 0's, a pool is defined as a collection of 0's completely surrounded by 1's. Example,

```
1 1 1 1 1 0 0 0 0 1 1 1  
1 1 1 0 0 1 1 0 0 1 1 1 1  
1 1 0 0 0 1 1 1 1 1 1 1 1  
1 1 1 1 1 1 1 1 1 0 0 0 0
```

This matrix contains only one pool since only one group of 0's is completely surrounded with 1's

Find the number of pools in a given matrix

I solved both the questions but could not pass all the test cases for the second question. But I solved the bonus problem in the first question and my overall score became high. So if you get any bonus questions, do not ignore them. They may help you score really well.

**Second Round (Telephonic):** The interviewer started with talking about Indore (my hometown), my weaknesses, my hobbies etc. So basically he was trying to calm me down (Tough I wasn't panicking. I've no idea why he thought I was :-P). Then he began with the questions.

Question 1: Suppose you are the in-charge of a project in which you need to develop an online railway ticket reservation system. What are the things that you would consider while planning out the project and why?

I was excited since I had prepared this answer already. Basically it's the kind of question where they wish to check the scale at which you think and how much you keep yourself updated with the latest technology. Firstly I talked about how our requirements would help in determining which technology to use. I told him about my projects in php & ASP.NET and then compared the two in terms of cost, scalability, support, ease of use etc. Then I told him a little bit about UI/UX and then finally about the factors that could cause our website to crash. We talked about database backup, restore etc. in short. There is no perfect answer to this question, you just need to show them that you think about the "Big Picture" while designing the system. When he was fully convinced, we moved on to the next problem

Question 2: You are given a pointer to a node in a linked list (Not the pointer to the Linked List!). How will you delete this node?

Frankly, I never heard this question before. It came to me as a big surprise that this question was quite common but I missed it during my preparation! I got nervous at this point. But I remembered that I should let the interviewer know what's going on in my mind, so I kept talking. But after 5 minutes he moved on to the next question and told that we would come back to this question again.

Question 3: You are a project manager & you have 100 hours to complete a project. How much time will you give to planning, coding and testing?

At this point I regretted sleeping during the Software Engineering Lectures. I thought making wild guesses would give a very bad impression. So instead of giving him numbers I told him that according to my experience coding would take maximum time, followed by planning and then testing. He laughed at my answer (Oh yeah... they do that - -). But maybe he thought of me as a kid who hardly has any experience and was kind enough to tell me that it's not how projects in industry work. They give maximum time to planning because if the planning is done properly then coding hardly takes any time! (I know most of you are with me on this :-P)

But while he was telling me all this, I got the time to think about the second question. But the problem was that my answer wouldn't work when the node was the last node in the list. And this is exactly what I told him before answering the question. Surprisingly my answer was correct. He asked me what I will do in case the node was at the end? I said I had no idea. Then he told me about "dummy node" but he told me that he was satisfied with my answer.

So my interview took more than 45 minutes (unlike my friends' which went for 20-30 minutes! :-O). I thought I messed up a lot & won't be selected for the next round. But I was (I guess others messed up more than I did ;-))

**Round 3 (Face-to-face in Microsoft IDC, Hyderabad Campus):** So the campus is huge, great interior, facilities etc. Within half an hour, I was called for my first round.

**F2F 1:** The interviewer himself came in the waiting area and took me to the interview room. Well it was a big hall with 8 interviewers sitting far away from each other. They all had their laptops, pens and few blank sheets with them.

Interviewer: Why don't you tell me something about yourself?

I gave him a brief introduction about myself (laid special emphasis on the fact that I am a Microsoft Student Associate ;-))

Interviewer: Okay so let's jump on to the questions... You are given a string that consists of Rs, Gs and Bs. You need to sort the string so that all the Rs come towards the front, Gs in the middle and Bs towards the end.

Approach 1: Brute force i.e. simple selection sort

Approach 2: Use 3 counters r, g, b and count the number of Rs, Gs and Bs in the first parse and put those many Rs, Gs and Bs in the second parse. (he smiled and said it's a good solution but he wants a different answer)

Approach 3: In the first parse, bring all the Rs towards the front. The remaining string would have only Gs and Bs. Similarly, in the second parse, collect all the Bs at the end (he said I can do better)

Approach 4: It took me a little time to think about this but he gave me hints and I finally came up with an algorithm. He asked me to code it and started doing his own work. I walked him through the code (and tried highlighting how I took care of the invalid inputs, corner cases etc. :-P)

Interviewer: Well... that's all from my side. Do you want to ask me any questions?

Well I didn't mind a bit of chit chat ☺ So I started asking him about the most challenging project he did in MS and about the development strategy that they follow for development of cross platform apps. He was nice and told me everything with a lot of interest.

**F2F 2:** 2 of my friends were rejected in the first round itself, while the rest 3 of us went to the next round. This interviewer looked very serious.

Interviewer: Tell me something about yourself...

With his expressions he didn't seem to be interested in my answer at all and quickly gave me a question.

Interviewer: Okay so you are given a string that consists of vowels, consonants and other chars. You need to sort the string so that all the vowels come towards the front, consonants in the middle and other chars towards the end.

I couldn't be more happier at that moment ☺ I didn't tell him that I had been asked this question in the previous interview & told him my approach (Approach 4 from last interview). But he understood that I knew the answer and so he changed the question ☺

Interviewer: You are given a matrix that consists of chars and you need to search for a string in that matrix. Now the string can be formed by going into any direction from a particular matrix position. So the only constraint is that the cells' corners must touch.

This was an easy problem and I told him my method

Interviewer: Now I'm putting one more constraint over this. You can not traverse an element more than once.

This was again easy. I just used a dummy character (\*) in place of the chars that had already been visited and restored the char back after the recursive step. He got a

little confused by this dummy char concept but then I explained him why it would work and he was satisfied with my answer. He asked me to code it then. I made a few mistakes which I corrected later but overall this round was good

**F2F 3:** This was the final round & was supposed to be an HR round. But since they had to finish off the interviews they sent me to a technical person! (I peeked into his laptop and saw that he had the feedback of my previous rounds and also the questions which were asked to me!)

Interviewer: Tell me something about yourself

I again gave the same answer (ofcourse with emphasis on MSA thing :-P)

Interviewer: What could you have done better in any of your previous interviews?

I told him about a small bug in my code. I forgot to increment a variable and the interviewer ignored it.

Interviewer: So I see you have worked on Hadoop. Can you tell me what you did in your project?

I was expecting this question and gave him a good explanation on this. My project was on network intrusion detection systems using big data.

Interviewer: Since you've worked on IPs, let me give you a small problem. Convert the following number into IPv4 format.

It was fairly easy and I wrote the code. I made a few mistakes in my code (I was really nervous this time) but corrected them later

Interviewer: Okay so tell me something about garbage collection...

Told the definition

Interviewer: In which language do we have garbage collection?

I told C++ (yes... that's what you do when you are under so much of pressure -\_-) He gave me a strange look and then I realized what I told him! But I guess he understood that I was panicking

Interviewer: Okay... what are unicode strings?

I never expected this question in an interview and I gave a very bad definition. He didn't look impressed at all.

Interviewer: Umm... let me give you a coding problem. You are given a canvas and you have to draw a line from point A to B. How would you go about doing this problem?

Phew... this question would save me (atleast that's what I thought). But I didn't consider the corner cases. He gave me a hint and luckily I could solve the problem successfully.

Interviewer: That's it from my side. Do you have any questions for me?

Yes ofcourse! I asked him about the most challenging project that he did but he seemed to be a bit confused about what to answer. So I explained him my question again and gave him a few examples of what other interviewers answered (It felt awesome at that moment because he was in the same position as I was 10 minutes back then :-P)

The experience was good because they focused only on technical stuff & the questions were also good. I really liked the helping attitude of people there.

I would like to thank geeksforgeeks for helping me out in the preparation for this interview. I think you guys are doing a great job helping out students ☺

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

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## Microsoft Interview Experience | Set 43

For Microsoft Bangalore CRM team.

Experience: 1.8 years.

### Round 1:(Written test)

1. Given a sentence say, "these are twelve pens and thirty two sheets" convert this sentence to "these are 12 pens and 32 sheets". We were asked to do it inline. The interviewer called each one of us and asked us to explain the approach.we were asked to minimize the space and time complexity.

### Round-2(Technical)

He asked me to Introduce myself and then started asking me what do I know about CRM.(Go through the website before attending the interview)

1. Given a client and a server and each of them has a queue in it. Client has to copy the contents of the queue to the server once the internet connection is up. The amount of data which it can copy at one go is fixed(Say 5 units). Design an approach for this. Let's say input queue is partitioned as 2MB,4MB,10MB,6MB and the fixed size of the window is 5MB. The output queue also has the same partitions as the input queue. (He was basically testing how i can use operating systems concepts, designing approach and data structures together).

2.Deep discussion on the current project which i'm working on currently.

3.Permutation of string with test cases.

### Round-3(Technical)

He asked me to introduce myself.

1.He asked me about the current project which im working on.. and a few questions on the technologies which were used in the project.

2. Given N prisoners who are standing in a line and M hatred relationships among them say,P1 hates P2, P3 hates P1, P3 hates P5 etc.. If any of the hate relation contains invalid cases like P1 hates P3 and P3 hates P1 then return false. Output the final order in which the prisoner should stand in the line so that they don't hurt

each other. say, if P1 hates P3, P3 should stand behind P1 so that P1 cannot hurt him. He asked me to code for the same.

3.Given a root, particular node and distance in a binary tree... say (struct node \*root, struct node \*n,int k) print all nodes which are at a distance of 'k' from node 'n'. He asked me to write the code.

#### Round-4:(Technical)

He asked me to walk him through my resume.

1. Why Microsoft?
2. Why do u want to leave your current company?
3. Deep discussion on the current project which I'm working on.
4. Given a binary tree how to construct the mirror tree out of it. I gave a recursive solution. He asked me to write the code for it. He asked me to write the same without using recursion and test cases for the program.

#### Round-5 (HR)

1.Discussion on current compensation etc.

Overall, it was really a good experience. GeeksForGeeks, you guys have made our lives so easy! Thanks a lot. ☺

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview Experience | Set 42 (For SDE1)

I received interview call from Microsoft (Bangalore) for CRM team, SDE1 position for 1.5 year experience.

#### Round 1: 1 hour

It was a GD like interview, with multiple people in same room given same question and interviewer was discussing individually with every person.

Given 2 arrays of integers, sort the first array based on order of 2nd array.

<http://www.geeksforgeeks.org/sort-array-according-order-defined-another-array/>

I started with brute force approach, then optimized to binary search and then hashmap

#### Round 2: 1 hour

Same as previous round, one interviewer, multiple candidates same question individual discussion.

If you have a stream of incoming characters, reverse and print the string as soon as input is finished. Write a code for same

#### Round 3: F2F 1 hour

One-on-one

Flatten a multi-level linked list

<http://www.geeksforgeeks.org/flatten-a-linked-list-with-next-and-child-pointers/>

Took a while to solve this one.

First I used a stack and then formed an algo without stack and without recursion.

#### Round 4: F2F 1.5 hour

A printed sheet of a c-program was given, had to find syntactical and logical error in program.

Connect all nodes of a binary tree which are at same level.

You can not store level information

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

<I used a variation of level order traversal>

#### Round 5: Hiring Manager <1 hour

Detailed discussion on current work, was grilled a lot

Reasons to leave current company

Reasons to join Microsoft

and other such questions

#### Tips:

Keep thinking loud and discussing your thought process with interviewer. They will keep giving hints for you to reach solution.

Find a solution, any solution, and keep optimizing it.

Hope this helps.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences

## Microsoft Interview Experience | Set 41 (On-Campus)

### MCQ Round:

15 MCQS were asked on c,c++, OS.

### Coding Round:

- 1) Given a linked list of co-ordinates where adjacent points either form a vertical line or a horizontal line. Delete points from the linked list which are in the middle of the line

**Eg:**

```
(0,10) -> (1,10) -> (5,10) -> (10,10)
      |
(10,5) -> (20,5) -> (40,5)
```

should be changed to

```
(0,10) -> (10,10)
      |
(10,5) ->(40,5)
```

- 2) Given a sorted array, convert it into bst

### Group Fly Round:

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

The code should be written on paper and should be error free. No extra space should be used.

### Interview 1:

- 1) Given a linkedlist of moves of 2 players in tic-tac-toe game . Find who has won the game.

### Interview 2:

- 1) Given a pile of 9 objects. 2 players take turns to pick 1 , 2 or 3 objects . The last one to pick is the looser. What is the winning strategy? winning strategy for 9 coins

- 2) Asked to how to design a cache for dns records. I have told different approaches like First-in-First-Out, less frequently used, least recently used... He asked me to tell the strategy and code it. I told LRU and implemented this.

<http://www.geeksforgeeks.org/implement-lru-cache/>

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## GATE CS Corner Company Wise Coding Practice

## Microsoft Interview Experience | Set 40 (Off-Campus)

I got mail one day that I have an Interview scheduled on next day in Bangalore.

### Round 1 onsite:

I think this round was just to check whether I take care of all boundary cases for problems and also my speed? Problems were quite easy then what I expected but they made it very lengthy to check my speed

General questions 1 :Tell me about yourself?

Q1: Tell me about your work in your current Organization ?

Q1: You have given an array of 0's and 1's. Write the code to swap only two elements in the array so the number formed by this array keeping all the elements in same order should be largest one.

I/P: 11000101 O/P: 11100100

Now he modified the question: Let's say instead of array, a number is given. Swap two bits of this number find out the maximum number formed after swapping these two bits

Again he modified that Lets the array elements are decimal numbers (Not 0s and 1s). Swap two elements and find out maximum no formed. Write the code.

Again he modified the same questions that lets say a number is given, swap two digits of the number and find the maximum number formed by it.

He was just checking my coding speed and making sure whether I check all boundary cases.

Q2: Pairwise swap elements of a given linked list (of course by changing links). After looking at my code he said that I have made a segmentation fault but I try to convince him that I wrote the code correctly and he was convinced.

After this round HR got a mixed feedback so he decided to go ahead with my next round.

### Round 2:

This round was basically focusing on my problem solving abilities. Coding was not tough but thinking and approach was critical.

Q1: A directed graph was given. I had to make a function which takes a value of node as input and print all the nodes which had incident edge on the input node and also print all nodes to which input node has a direct edge. He kept ignoring the solutions I told because he wanted it to solve in a particular way.

Q2 : Find the largest rectangular area in a Histogram. I read this question long before but couldn't remember it but fortunately I was able to solve it with few difficulties.

**Round 3:**

Q1: basics of computer science: Multithreading, long discussion on dynamic memory allocations, memory leak, some OS fundamentals. Some compiler design questions where he helped me and finally we reached to the solution.

Q2: You have a stream with millions of words in it. Find most frequent 10 words in that stream at every instance

Q3: How will you store a very big number if it can't be stored in any data type?

**Round 4:**

This was a designed round and interviewer was principal development manager.

Again round started with 'tell me about yourself and the work in the current Organization'.

Question 1: He opened the site msn.com and asked me to design a part of 'stockscreener' hierarchy using my OOPs and MVC understanding. And asked me write a class which will show the user that if stock market is open or closed. If it is closed then I have to print when the market is going to open in future. To find the future date he gave me a list of Holidays, Half days and obviously market will be closed on Weekends. So store this information in a proper Data structure and use it in finding future date.

This question took around 35-40 minutes of time

Q2: For a Sudoku game, I had to design a screen using OOPs and MVC understanding. Where a column can be empty where you can put a editable number in future or an editable number which you can change as per your requirement or a fixed number(inserted by system only and user can't change them). This question was an easy one so hardly took 15 minutes.

Q3: Simplest of all, for a given BST I had to print all the numbers in ascending order which lies in a given range in best possible optimum way.

**Round 5:**

This was the last round and the interviewer was 'Partner Development Manager'. I knew he has veto power and today he is the one who will decide my fate, so I was more nervous and conscious but he made me so comfortable and welcomed. For first 10 minutes or so we were just chatting about our views on movies and asked me who do I think most underrated actor in Bollywood? I said Jimmy Shergill and he said he also thinks the same.

Asked about my college life and achievements? What is the biggest achievement so far? Why do I have less percentage in 10th class? Why are you changing the company?

Then he moved to puzzles.

Q1: There are N people in a room and one of them is a celebrity. In the room everyone knows the celebrity and celebrity doesn't know anyone in the room. You have 1 question 'do you know him?' and you can ask this question N times to anyone in the room. The person to whom you are asking question will reply 'Yes, I know this guy' or 'No, I don't know this guy'. By asking the same question N times to whoever you want to ask you have to figure out who is celebrity in the room. If A knows B doesn't mean B knows A.

After that He asked my 2-3 more puzzles which I knew already and I told him so he asked the solution and moved on.

Q2: A Matrix of 1s and 0s is given, all zeros are water and 1s are land, first find out the number of ponds in the array (Reverse of islands problem). If one change can convert 1s in to zero then find out minimum number of changes that we need to make so that there will be only one pond in matrix.

In the end, he asked me whether I am preparing for other interviews or higher study so I knew all the puzzles. I said No but I like puzzles and I am good in them.

This was all. A big thanks to GEEKSFORGEEKS, you guys made our life so easy. You are Google for me as far as an interview preparation is concerned.?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview Experience | Set 39 (On-Campus)

?I like to thank geeksforgeeks.org for my ?entire journey in placement.

**Round->1 (multiple choice questions)**

1. Intersection of two linked list.
2. There is a 2 d array. 0 signifies water and 1 signifies land. an island is connected 0s(in all 8 direction) and no 0 should be on the outer edge of two array. You have to count the number of such possible arrays.

You have to solve both coding question to enter in 2nd round

In round 2 interviewer were very cool and supporting. try to shake hand while entering and ask every detail of problem.

**Round 2:**

1. Explain yourself.
  2. A backtrack problem on sudoku.
- write full code on paper in any language. write failure case of your code.
3. Discussion on projects.

I had done a project on big data on frequent itemset. They were really interested in each and every detail of big data paradigm.

4. Your strength and weakness and extra curricular interests,

**Round 3:**

1. There is a 3 million character string. You have to print the count of occurrence of each node.

do not jump on to the question. wait for him to complete. I gave count sort of  $O(n)$  solution but he was focusing on more optimized one.

2. again he jump to my big data project. he gave me a real life scenario and asked to design it.  
you are giving the information of about 10,000 sites about their users and the product they had bought. you are a consultant. give a big data solution to find out the places where users had bought the jewellery in large amount. also give the name and details of users who had bought jewellery in large amount.

he was quite impressed by my design. we discuss the design for about 30 minutes. then instantaneously they told me that i am selected for 3rd round.

#### Round 4: (HR round)

HR was very cool

1. tell me about yourself.
  2. why Microsoft.
  3. tell any 4 of your favorite products of Microsoft
  4. tell 2 good and 2 bad points of Microsoft.
  5. Why you opted for your college.
- he was trying to check my planning skills to compare 2 entities.
6. Why computer science.
  7. Tell any 1 social problem that bothers you the most.
  8. Suggest 3 solutions to above problem as a technical guy.
  9. what is big data
  10. what will you do if your colleague is not working
  11. what if you are not agreed with your senior

My tips is to stay cool and enjoy the interview. carefully tell your weakness. Don't worry to ask questions from interviewer. Take proper use of the time. Big data helps me a lot in every round. focus on designing problems along with data structure.

geeksforgeeks.org alone is sufficient.

Best of luck to all guys who are preparing.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 38 (For Internship)

I completed my internship at MS-IDC this summer. Here is my interview experience.

#### Round 1(Online MCQ):

Varying level of difficulty. 15 MCQs. Topics: C/C++, data structures, DBMS, OS, Networking

#### Round 2(Coding test-online):

Two coding questions were given. Fairly simple. One was to print nth element from last in a linked list. Other was to convert a number to base 4 number

#### Round 3(Telephonic Round):

He asked me about myself, and a couple of questions from ethical hacking(I had written about it in my CV). Then he asked me to develop an online chess game. The entire class definition, data structures to be used and graphics implementation etc were discussed.

The interviews were held in a college in Delhi.

#### Round 4:

Firstly he asked me about myself, then my projects. Then he asked me to write a code to remove comments from a C file. Then he asked me the approach to detect a loop in a linked list. Then he asked me to design a system that would add two polynomials.

#### Round 5:

He gave me a very tough question of graphs. It was similar to a traveling salesman problem but had two paths, one path or no path to every other city. One possible way of reaching the other city was via plane and the other was a taxi. The salesman had a fixed number of coupons for both taxi and plane. He had to save maximum coupons at the end. Then, test cases for this problem. I wasn't the only interviewee in this round. I had another person sitting next to me. He was rejected while I made it through.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft IDC Interview Experience | Set 37B

Microsoft conducted their first round of shortlisting for placements and internship. The online coding round was organized by CoCubes like last year.

The test was for 1.5 hrs and had 2 coding questions. Allowed programming languages were C, C++ and Java.

The questions were as follows:

- 1) Given the head of two linked lists , find the merging point of both the linked lists. In case the linked lists do not merge then return NULL.

2) Given a 2d array of 0s and 1s where 0s represent water and 1s represent land. A connected patch of 0s count as one single water body and if a water body is covered by 1s all around it then it forms one pool. Write a function to return the total number of pools in the 2D matrix. In case a water body is present on the boundary of the array immediately return -1.

Sample test cases :-

**Input :**

11111  
10101  
10111  
11111  
11111

**Output :** 2

**Input :**

11110  
11111  
11011  
11011

**Output :** -1

**Input :**

11111  
10111  
10011  
11011  
11111

**Output :** 1

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### Microsoft Interview | Set 37 (For SDE-1)

**Skype round:**

1) Print the last n lines of a file (Hint : treat it like a linked list)

2) Length encoding –

Input: aaabbc Output: a3b2c1

**F2F round 1:**

1) Given a few points in first quadrant – (x1,y1) ....(xn,yn) and given another set of points (a1,b1....an,bn), determine whether all the points (a1,b1...an,bn) have already occurred in (x1,y1)....xn,yn)

2) Given a graph where every two nodes are either friends or enemies with each other. Find a way to go from one node to the other.

Restrictions:

1) You can also travel from one node to next if they are friends with each other

2) You have some "magic potions". You can convert an enemy path to a friend path with a magic potion.

Find the path with min number of magic potions required.

**F2F round 2:**

1) Discuss one good, one bad feature of facebook. How you will redesign it to improve it?

2) Implement auto complete.

3) Given numbers a1...an find the minimum index, whose element occurs twice in the array. Do it in one pass of the array ( or less than O(n) if possible?)

e.g 3 2 4 4 2

Output : 1 (is the lowest Index) since, '2' repeats twice.

Follow up:

Return the element that repeats at the earliest in the array. Output: 4

**F2F round 3:**

With GM. General discussions about projects/work culture/goals.

I got a call after two days that I've been selected. Many thanks to geeksforgeeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

# Microsoft Research India Interview | Set 36 (On-Campus for Internship)

Recently Microsoft research india invited application for internship.They shortlisted based on CV (projects related to your topic of interest and CGPA).

After shortlisting I had one telephonic interview of about 40 minutes:

Main focus was on the project I did. I had to explain every thing I did in my project its basic utility and model.Interviewer asked me key challenges faced, key aspects used and many other things related to my project.

Then he asked me one data structures question:

Given n numbers you need to find min and max.How many comparisons are required.. optimize the approach

( <http://www.geeksforgeeks.org/maximum-and-minimum-in-an-array/> )

Then he was satisfied with the answers, he asked few more questions based on my project. I pushed some codes of project on github and provided link of the same in my cv so he asked about who came up with the design and how did you do this and that..

Finally the interviewer offered me internship offer at MSR India.

Special tips:

Be confident during whole interview.

Have positive attitude and talk with the interviewer while solving any question.

I want to thank geeksforgeeks for providing such a useful bank of questions.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

# Microsoft IDC Interview | Set 35 (On-Campus for Internship)

**Online test:** This test was organized by cocubes.com, and had to be completed within an hour.

There were two coding questions:

1. There is a linked list whose node is defined as follows

```
struct node
{
    int x,y;
    node* next;
};
```

We had to implement a function which takes the head of linked list, and if any three consecutive points lie on same horizontal or vertical line, we had to remove the middle node. The linked list will either be empty or will contain atleast two nodes. The function prototype was:

```
void remove(node* head)
{
```

Example:

**Input:** (1,2)->(2,3)->(2,4),(2,5)->(3,4)  
**Output:** (1->2)->(2,3)->(2,5)->(3,4)

2. Given a sorted array, convert it into a height balanced binary search tree. A height balanced tree is one in which for every node, the height difference of left and right subtree is at most 1. Node of binary tree was:

```
struct node
{
    int data;
    node* left;
    node* right;
};
```

Function to be implemented was:

```
node* binary_tree(int* ar, int len)
{
```

### Interview:

There were 3 rounds of interview, and we had write code on paper.

### Round 1:

There were two questions:

1. Given a string, remove all continuous occurrences of 'a' and any occurrence of 'b'.

Example: Input: "aacbccdbssab", then output: "accdsssa"

2. What data structure should be used if we have to implement insert and delete functions in a text editor? The functions should be as fast as possible.

### Round 2:

Question 1: Given a string and two positions in that string, shuffle the string, that is, move the given substring to the front. Example:

Input: abcde~~fgh~~, 4,6

Output: defabcgh

This has to be done inplace with O(n) time complexity.

Question 2: How to implement dictionary data structure in C++? What kind of hash functions shall we use? How to manage collisions?

Question 3: How would you implement vector data structure in C++ on your own? What would be the accessing time complexity? How can you make it O(1)? How to resize the structure?

**Round 3:**

Question 1: Given a k-ary tree, how to print the elements layer wise?

Question 2: Given a singly linked list and a number 'n', write code to reverse every 'n' elements of the linked list. Example:

Input: 1->2->3->4->5->6, n=3

Output: 3->2->1->6->5->4

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

## Microsoft Interview | Set 34 (On-Campus)

### 1st Round (Online)

15mcq 30mins – Most from C/C++. Few from OS

### 2nd Round: Coding Online (1 hour)

1st quest: <http://www.geeksforgeeks.org/intersection-of-two-sorted-linked-lists/>

2nd quest: <http://www.geeksforgeeks.org/check-for-balanced-parentheses-in-an-expression/>

*13<sup>th</sup> august:*

**Top 20 students were selected for the next round. 8 had direct interviews while the rest 12 of us had another elimination round. The selection was done using the total score of both the online rounds**

### Elimination Round: Pen and Paper (20 mins)

Write the code implementing a queue using stacks.

### Interview 1: Technical (1 hour 15 mins)

The interviews were on in parallel and when I went for my 1<sup>st</sup> interviews some were already rejected while some even had their 2<sup>nd</sup> and 3<sup>rd</sup> interview rounds.

Asked about myself and my history followed by technical questions.

1. Suppose you have an array of elements which has duplicates except 1 number, ex. 1,2,3,4,3,2,1. You need write a pseudo code to find the unique number. Here ans – 4. Also asked the complexity of my code which was O (n).
2. Tell the pseudo code to reverse a linked list.

I started to make the logic for O (n) but he said it might not be possible to do it in 1 iteration so not an issue. But I gave him the logic of O (n) and 1 iteration.

3. You have a matrix a[m] [n]. Transpose it into a matrix b[n] [m] in minimum iterations. I could think of m\*n/4 at most.
4. Questions on OOPS
5. Difference between OOPS and C
6. Difference between abstract classes and interface. Gave cases for me to tell the error or right ans in abstract classes.
7. DBMS: 5th largest salary of employees from a given table. I answered using rownum and then limit but he wanted a general ans. So all I could tell was using nested query.
8. Puzzles:

– There are 25 horses. Only 5 can run together at most. You have no timer. Min no. of runs reqd. to find the fastest horse.

– There are 4 people who want to cross a bridge. Minimum time they take to cross a bridge is 1, 2, 7 and 11 respectively. There is only 1 torch and at most 2 people can cross a bridge at a time. But no one can cross the bridge without torch (Someone has to come back to give the torch). Find minimum time in which all 4 cross the bridge.

2<sup>nd</sup> puzzle I 1<sup>st</sup> answered 22 but then corrected myself and answered 18 (1 and 2 cross. 1 comes back. 7 and 11 cross. 2 comes back. 1 and 2 cross – total time 2 + 1 + 11 + 2 + 2 = 18).

I was informed 5 minutes after my interview to be ready for the 2<sup>nd</sup> Round.

### Interview 2: Technical (20 mins)

Was asked about self, my project on cloud computing and questions related to it.

1 technical question.

Write a code to delete x elements after 1st n elements.

I wrote the code but missed the case where  $n = 0$ . So as he was checking the code I told him the case I had missed. He was confused if the code would work if there were less than  $n + x$  elements but I showed him that it would.

Was a short interview compared to others and was scared of being rejected but finally was called for the hr interview in sometime.

### Interview 3: HR (20 mins)

He first told me about the code I had written in the elimination round that it was the best code he got in the day. Following it were typical hr questions.

Tell about myself, my strengths and weaknesses. Why do I want to join Microsoft?

Why should Microsoft hire me?

About my college project and my summer internship project.

What would you like to improve in yourself 3 years from now (other than knowledge)?

Finally after the whole day of interview I was selected with 1 more guy from our college. Thanks to [geeksforgeeks.org](#) and [geeksquiz.com](#) for helping me prepare and crack the interview.

#### Important Points:

1. Always show a lot of energy in the interview.
2. Microsoft gives great importance to values and ethics so stick to them in your questions.
3. Speak out whatever approach you think in the interview. The interviewers do not want to sit idle. They love to understand how you think.
4. Do try showing company's goals as yours.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

### [TopTalent.in] Exclusive Rapid Fire Interview with Gritika Who Got a job offer from Microsoft



For Gritika, and for many others like her, Microsoft is a dream company. As she recalls 'I sat for Microsoft as a part of my campus recruitment.

Microsoft has always been my dream company. After getting placed, I didn't sit for any other company.' Being relieved at the thought sign off a recruitment season at a high, her biggest moment to savor was seeing a smile on her parents' face.

We at [TopTalent.in](#) spoke to Gritika from Jadavpur University about her experience of a Microsoft interview and what others can learn from her experience. You can also [download](#) her resume to see her detailed profile.

My toughest interview was the third round of my Microsoft interview, after which I was asked to leave. But, seems like I was destined to get the job and was called back  Even the HR round was quite grilling, the interviewer was very friendly still the answers he expected had to be prompt and precise.

**Your Preparation Strategy:** I worked on data structures. I feel if you have a sound knowledge of the various data structures, it helps in optimal problem solving. But practicing codes is also very important, as it enables us to identify all possible bugs and test cases.

**Resources:** Geeks for Geeks, I owe my success to that site. My college seniors were also very helpful. They guided me, which enabled me to only study the relevant topics from the pool of available topics.

**Your Skills:** Writing codes efficiently (on paper as well), this helps in the PI rounds as we can develop linear program writing skills. Identifying test cases, as we know Microsoft puts great emphasis on test cases.

**Advice:** Have a mind of your own. Don't just mug up efficient solutions to problems, try to come up with your own solutions. This is what makes you stand out from the others when you are confronted with an unknown/unexpected problem.

**Resume:** Keep it precise (within 2 pages). Highlight your skills and achievements. Doing project work is certainly helpful as it demonstrates that you are capable of developing something useful from just a list of requirements.

In case you missed, you can also [download](#) her resume to see her detailed profile.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

# Microsoft Interview | Set 33 (On-Campus for Internship)

Recently Microsoft IDC had visited our Campus for Internship. There were 6 rounds in total for me.

## Objective Round :-

The objective round was taken in Cocubes.com, there were 15 questions (1 question was repeated in my set). There was a question about "Rectangular Collisions in an array" which I had no idea about.

## Coding Round :-

There were two coding questions :-

1) Find an element in a sorted array which has been rotated circularly at only one location in O(logn) time.

(Refer <http://www.geeksforgeeks.org/search-an-element-in-a-sorted-and-pivoted-array/>)

2) Find the inorder successor of a node in a Binary Search Tree.

(Parent pointers were present in the BST). (Refer Method 1 of <http://www.geeksforgeeks.org/inorder-successor-in-binary-search-tree/>)

## Group Interview Round :-

First 10 minutes, he asked about what we expect to be the next big thing in technology. Then he gave two questions :-

1) Given a string, you have to check if it is a valid number or not.(The number can be signed, floating point/integer). If it is a number return true else return false.

The constraints were :-

i) No decision statements allowed (No if-else,no switch-case).

ii) No ternary conditional operators allowed (? : not allowed).

iii) No looping statements allowed (No for/while/do-while).

(My solution was a recursive implementation returning a bool having only one return statement using relational operators and two global variables, one for checking if it is the first occurrence of a '.' and other for checking if the sign '+/-' occurs in 1st location or not).

2) Bing wants to improve the experience of users by giving reward points to users. Devise an algorithm to assign reward points to different users.

## Personal Interview Round I :-

1) You are given a string containing only '(' and ')', check if the string is well formed,i.e. check if the parenthesis is well matched.

(Either have a count of '(' or use a stack for pushing '(' and popping when ')' is encountered).

2) There is a Bot Class with the following prototype :-

```
class Bot {  
// private data members  
public :  
    bool moveleft(); // The bot moves one block left and returns true.  
    bool moveright(); // The bot moves one block right and returns true.  
    bool movebottom(); // The bot moves one block down and returns true.  
    bool movetop(); // The bot moves one block up and returns true.  
    bool hasGold(); // returns true if the current position of bot has gold.  
};
```

You are given a bot and the dimension of a maze having walls and some blocks having gold, check if the bot can reach a block containing gold.

(Use dfs graph traversal using the recursive implementation and return true if the current position has gold and return false only if you cannot move any further).

## Personal Interview Round II :-

1) You are given the roots of two binary trees, check if the trees are isomorphic or not.(Initially he framed the question for a tree (not a binary tree) and gave me two random nodes instead of the roots).

(Refer <http://www.geeksforgeeks.org/tree-isomorphism-problem/>)

2) You are given an array of n X m dimension. You start from (0,0)th location. You can move from (i,j) to any of (i + 1,j),(i,j + 1),(i + 1,j + 1)th locations. Find the total number of paths starting from (0,0)th to (i,j)th position.

(For all i and j, dp[i][0] = dp[0][j] = 1, dp[i][j] = dp[i - 1][j] + dp[i][j - 1] + dp[i - 1][j - 1]).

## Personal Interview Round III :-

1) Given a dictionary, group the anagrams together.

(Sort each string in dictionary, as anagrams will have same representation after sorting, use a hash map to store the groups of anagrams).

2) He asked questions related to my project.

Thank You geeksforgeeks.org.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Microsoft

# Microsoft Interview | Set 32 (On-Campus for Internship)

Recently Microsoft conducted an on-campus interview at my college. It consisted of 5 rounds which were all on-campus. They were as follows:

## Round 1(online)(30 minutes):

Consisted of 15 mcqs mostly related to c/c++ and probability. It was fairly easy and very few people were eliminated.

## **Round 2(online)(1 hour):**

We had to write two programs in this round.

1.A sorted list of strings interspersed with NULL in random indices is given. Return the position of a given search string. Return -1 if string not present.

ex:"a", "b", "", "c", "".... find "b" . o/p: 4

Just a simple linear search will suffice.

2. Given an array of integers where all the elements occur odd number of times except 3 elements which occur even number of times, find the 3 elements.

A brute force solution is fine. You may also use a hashmap.

The above two rounds were hosted by cocubes.com.

## **Round 3(Group fly round)(30 minutes) :**

Groups of 5 were made amongst the remaining candidates. Each group was assigned an interviewer and we were given a problem to solve.

Write a program to rotate a square matrix 90 degrees clockwise using constant space.

## **Round 4(F2F)(90 minutes):**

The interviewer asked a lot of questions about my projects. Spent about 30 minutes on questions related to NLP and machine learning. Asked me about SVMs, neural nets, back propagation etc.

Then he moved on to programming questions. I was asked to program a regular expression(regex) matcher. Given a pattern string and an input string return true if the two match. The regex special characters like \* and ? had to be taken into consideration. Basically if there is a '?' in the pattern string any character in the input string can take its place. Same goes for '\*' but in this case any number of characters can replace it in the input string.

**Example:** a\*b matches acdb  
 a?b matches acb  
 a\*b does **not** match bca  
 a?b does **not** match acdb

The rest of the interview involved making modifications to this program. For example, modify the program so that it returns true on a partial match, i.e. even if the pattern is present inside the input string.

## **Round 5(F2F):**

This round started with questions like why do you want to work for microsoft? Tell something about yourself etc.

Then came the final round of technical questions.

I was asked to write 2 programs and answer some theoretical questions.

- Given a MxN matrix of 0s and 1s convert all rows and columns to 0 which have at least one 0 in them. You can use O(m) space.
- Given a matrix of characters and an input string, return true if the string is present in the matrix.

```
input string = ABCDE
Matrix = A T G
         B E H
         C D V
```

Output: string is present.

## **Some final questions:**

- Some questions about b trees. Don't remember the exact questions.
- Describe an algorithm to balance a binary search tree.
- Describe another algorithm for the same.

This was the final round.

I would like to thank the geeksforgeeks team for providing us with such a fantastic platform.

Hope this helps at least some of you.

Thank you.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Microsoft

## **Microsoft Interview | Set 31 (On-Campus)**

Recently Microsoft came to visit our campus for offering SDE positions. Here is my interview experience.

**Online Rounds:** These were organized by CoCubes.

Round 1 – There were 15 simple MCQ's. Most of them are from GeeksQuiz. Most of the students cleared this round.

Round 2 – There were 2 coding questions

- Given a sorted list of strings that may contain NULL in random indices , return the position of a given search string. Return -1 if string not present.

ex:"at", "bat", "", "car", "", "", "dog" ... find "car" . o/p: 4

I initially tried a modified binary search, but something went wrong, So did a simple linear search. My bad ☺

- Given an array of integers where all the elements occur odd number of times except 3 elements which occur even number of times, find the 3 elements.

They shortlisted 39 students for a Group Fly Round.

**Group Fly Round:** Students were divided into groups of 3 or 4 and were assigned a mentor. Everyone was asked the same question and was expected to write a clear and neat C/C++ code with comments wherever possible.

The question was that an 1-D array contained N\*N elements. Assuming that the N\*N elements form a matrix, you have to rotate the matrix in-place.

A group of 16 students were selected from this round for Personal Interviews.

#### F2F : Round 1 – 30 mins tops

What is your favourite subject ?

– OOP

What are the basic aspect of OOP ?

– Polymorphism, Encapsulation, blah blah

Explain Polymorphism to a layman

– More blah blah

How and when is it implemented ?

– Run time and Compile time, via Overloading and Over-riding

He asked me to write sample code for each, which i did.

Given a linked list which has got a loop, how do u detect the loop. ?

– Floyd's cycle detection algorithm

He asked me to code it. He was happy; I had put checks for all corner cases.

Count the number of full nodes in a binary tree. Full nodes are those which have both non-null left and right children.

– I gave a pretty easy recursive solution. He asked me to do it iteratively using a different traversal. So i did a level order traversal.

He asked me to give all kinds of corner cases. He was happy.

Have you implemented thread library ??

– Yes in Java and C++

Difference between thread and a process ??

– Blah Blah.

#### F2F : Round 2 – 45 mins

The interviewer was very serious and directly went into coding questions

Given an array containing elements where all elements have even occurrences except two elements, find those elements.

– I gave him the xor approach where you have to find the rightmost set bit and then divide into two groups. He was waiting for that and went directly to bit representation, i.e. Little Endian and Small Endian.

Followup : Check if the given machine architecture is Little or Small Endian.

Given two Strings, find the minimum length window in the first string containing all the elements of the second string.

-Did it pretty quickly. He kept tweaking the questions and asked me to make necessary changes in the code. Finally he asked me to give some good test cases.

#### F2F : Round 3 – 45 mins

This was my final round with the AA Manager.

He first asked me about my dismal CGPA :3

Then we discussed a little about my projects.

He asked me about semaphores and we had a little discussion about the types of semaphores. Then he asked me to write the Signal() and Wait() functions. Finally he asked me to implement mutual exclusion in critical section. I gave the Peterson's algorithm. He moved on

Given an array of elements arrange the elements such that the odd elements are in the odd position and even elements are in the even position.

– I gave him a two pass approach where i segregate first and then separate accordingly. But he asked the one pass solution. This was when my luck ran out. I know its pretty easy, but messed it up. And the guy was also adamant because even after 15 minutes of trial and error, he asked me to go on.

Though I didn't get the job, it was a wonderful experience to be interviewed by such experienced people from the industry.

A few points that i thought would be worth mentioning –

\* Think out load, let the interviewer know that you have actual depth in the matter

\* Always ask questions about a problem if you are not sure

\* Always think about the corner cases and uncommon test cases before you start writing your code

Also, a big thanks to the entire GFG team for their constant efforts Keep Coding, Keep Rocking.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview | Set 30 (On-Campus)

### Online Round:

15 MCQ's and 2 coding questions organized by CoCubes.

Coding questions –

- Given a list of strings separated by space, return the position of the required string. Return -1 if string not present.

ex:"at", "bat", "", "car", "", "", "dog" ... find "car" . o/p: 4

2. Given a list of numbers find the numbers occurring even no. of times.

#### Group Fly Round:

Rotate a 2-d Matrix clockwise by 90 degree (inplace)

#### Round 1:

What do you understand by polymorphism? What are constructors? When are copy Constructors used? What are virtual Destructors? Why do you need them?

Detect whether a linked list has a loop. Find the length of the loop.

Print the values of the Full Nodes in a Binary tree. (A node is said to be full if it has both right and left children).

#### Round 2:

Tell me something about yourself.

What does the word 'System' mean in System.out.println in Java?

Given 2 sorted arrays, find the median element. (without extra space)

Search for an element in an array. (He just wanted n comparison i.e. I was using a for loop which has a comparison and another comparison within the for loop to find the element., he counted them as 2 comparisons. Hence 2n comparison.)

First Normal Form. If a schema has a date attribute is the schema in 1NF.

#### Round 3:

Tell me something about your project.

Find the index of the element which is greater than the given number(the number may or may not be present in the array). The array is sorted , contains duplicates .

Delete n elements after m elements in a linked list, continue till the end of the list.

#### Round 4:(HR round)

Why do you want to work for Microsoft?

He gave a list of functions that can be used in a file. Find the last n lines in the file using those functions only. (Have you heard this question before? Have your friends discussed it with you? If you were in place of your friends would you tell them about your questions?)

Given a 2-d Matrix sorted row wise and column wise . Find the k-th smallest element.(Not the min heap method, he needed a more optimized method. He guided me through the question.)

Note: The panellist were quite experienced they will understand whether you know the question or not. So just own up. Test Cases are very important.

Microsoft has an amazing set of panellist. They are only interested in the basics. They won't ask very difficult questions, because they want to understand whether you can come up with a solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft

## Microsoft Interview | Set 29 (On-Campus for Internship)

Recently we had microsoft interview for internship in our campus.

#### Online Test

It was the technical + few aptitude test. There were around 4-5 set of mcq for all students at Cocubes.com. i was lucky to have a easy one.

Then i was selected for 2nd round .

#### Round 2 : (online judge)

Around 200 people were selected for 2nd round. This round contained 2 question.

1) Given a linked list which contains series of numbers seperated by "0". Add them and store in the linked list in-place.

for eg : i/p linked list is 1->2->3->0->5->4->0->3->2->  
o/p Linked list is 6->9->5

2) Given a binary tree and value V. delete all the leaf nodes whose values are equal to V. It must handle all cases for example if u delete both leaf from a node Say B. Then the node B also becomes the leaf node.

This round was pretty easy one . first one can be done in O(n) and 2nd one can be done by postorder traversal.

I was confident that i will be selected for next round. after one week results was announced and 24 students were selected for next round.

#### Round 3: (group interviews Written test)

This round for the only 17 students and first seven were allowed to enter directly 4th round. i was one among the seven. The ranking was based on the scores of first two round. so each and every round matters in microsoft.

2 question were asked for this interview.

1) Delete alternate nodes in a doubly linked list.

2) Convert a string into a string without duplicates without changing the order of characters IN PLACE. EG: Input: Bananas Output: Bans.

Many of them were easily eliminated from this round. Neatness and indentation also matters.

#### **Round 4: (technical round )**

This round was the toughest round of all. The interviewer seems to be little strict. He called me and one more boy inside for interview.

I thought he will select one among us for next round. but actually they don't compare in these ways. first question they asked me was

1) given a 2d character array and you're allowed to move down, left, diagonal down and form a string and check whether that string is present in the dictionary or not.  
ans. I gave him backtracking approach and he saw that and he asked whether I can improve it little more. I gave binary search solution for searching in the dictionary and he told me that I can use prefix checks also. then I made use of it. Then he moved to second question.

2) given a chess board nXn size and knight and you start from position (a,b) and have to reach (C,d) in minimum number of steps and there can be wall in some squares boxes also which blocks knight.

I was really nervous and in tension I gave him DFS solution. he kept on asking me that can I improve it or not and finally I told I can apply Dijkstra algorithm. but I didn't mention the word BFS. I came out and I thought I won't be selected for next round.

Meanwhile the questions asked to my friend were

1) topological sort

2) box stacking dynamic programming problem .

#### **Round 5 (personal interview) :**

They called my name and I went inside. I have my resume to him and he went through it and then he was impressed by my Groupon internship during 2nd year. then he asked me Why Microsoft? and then we talked for a while about games programming (Xbox) and he asked about cloud computing. Then he saw in my resume that I was mentor in Data Structures for Weak students so he asked my question in Linked list.

1) Given a singly linked lists of 2n size. First n and second n are sorted. Sort the entire linked list. he asked for all possible solutions. I told him solutions for

1) swapping by node

2) swapping by data

3) merge sort method

4) hashing (counting sort method)

It was not too hard one .

#### **Round 6 (final round)**

I think it was stress interview. The interview called me inside with one of my friends. he asked us about previous two rounds. Then he gave me 2 questions

1) Design LRU cache. (I read this just a day before)

2) Find and replace in a string.

Finally I was selected for Microsoft internship. The people from Microsoft were also very good and friendly. I read few websites before interviews and GeeksforGeeks is one of the best among them. It's really good to prepare for interviews from GeeksforGeeks and each and every round matters in Microsoft.

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Interview Experiences  
Microsoft

## **Microsoft Interview | Set 28 (On-Campus)**

**Microsoft Interview Experience(On Campus)**

#### **1st Round :**

Online test was taken in the morning by Cocube with 15 MCQ. Time was given for this 30min.

I had some problem (can't write here) so I did in 10 min and rush back to room. (I think you understand why I came back to room.)

After 2 hours result announced and I was in the shortlisted of 78 students.

#### **2nd round begin : (time 70min.)**

Again an online coding round began with 2 questions given.

Q.1: An array of strings is given in sorted order but it can have any number of null strings in between. One another string you have to search in that array of strings. If string found then return the index of that, otherwise return -1.

Q.2: An integer array is given which consists of integer numbers. But in that array 3 unique numbers are there whose number of occurrences is even.

Print those three numbers and the sequence in which they appear in the array.

I did both of the questions. One I did myself and another one with the help of my friend.

Result declared after two days on Friday. My name was also there with 28 students.

#### **Round 3 Begin: (Group Fly Round):**

They assembled us in a room and gave the same problem to everyone and asked to write the algorithm for that.

Question: word reversing of the string.

Eg. "Microsoft visited your campus".

Expected Output: "campus your visited Microsoft".

Question was pretty simple; everyone knows how to do it.

I don't know on which basis the selected only 12 out of 28 students, and I was one of them who were selected.

#### **Round 4 (F2F) : (Time 1hr.)**

It was technical round.

Firstly he went through my resume and asked about my project (Done in C++) which I mentioned in my resume.

They asked which OOPS concept you used in your project. I told and explained everything whatever I had used...

Then he asked me by which OOPS concept you can improve your project... I told about STL and explained how I'll do.

Then he came to data structure and ask very few simple questions....

Q.1 : an array of 1...N no is given to you, but one no is missing, how will you find that.

I think everyone knows how to do it..

Q.2 : A string is given to you, and you have to find out first non-repeating char.

I had done before this question from geeksforgeek. So no problem at all.

Then some optimization discussion on different assumption's like...if you string consisting Bytecode char and all.

After one hour they announced the result of Round 4, I was the one of 7 students out of 12.

#### **Round 5 (F2F) : (Time 1hr.)**

It was another technical Round.

Firstly he gave me his intro then I.....

Then he gave me my page on which I had written algorithm in Group Fly Round. And asked me to code it.

I did and explained.

Then he asked me.... For implementing a dictionary which data structure you will use..???

I answered I'll use Trie .

He spelled 'T' 'R' 'E' 'E'...

Then I said no sir 'T' 'R' 'I' 'E'...

I explained with structure of trie how it is useful, beneficial and efficient.

He told me to implement it in Tree.

I did that...By BST

Then he made a loop in my BST by connecting two child node. And asked me to remove it..

I loop is not possible in a BST.

He asked me to proof it...and I proved.

Then he came to Puzzles.....

He gave a puzzle of "8 coins and a balance scale"

I knew it because I had done already.

But don't know why I couldn't solve there.

He gave me some hint after some time he told me the ans and how to do...

It can be done by using balance scale two time.

Mine answer was 3.

.....

.....

After some time result came out....

5 students were selected out of 7 for final HR round...But this time I was in those 2 who went out..

.....Thanks a lot to GeeksforGeeks for helping me.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Microsoft

## **[TopTalent.in] Exclusive Interview with Prashanth from IIT Madras who landed a job at Microsoft, Redmond**

Armed with a dual degree from IIT, Madras, and a very strong resume, Prashanth Srikanthan was destined to land a lucrative offer from one of the big recruiters. So when Microsoft came calling he converted his potential into a Rs 60 Lakh package as a Software Engineer. TopTalent.in brings you his opinions and advice about dealing with interviews.



**TopTalent:** How does it feel to be selected by Microsoft?

**Prashanth:** It felt good to be recognized for the effort put in. It was definitely a proud moment to be hired by a company with such a rich history. After a few years of lacklustre activity in the spectrum of consumer products, I believe Microsoft is finding its way again, so this is an exciting time to join the organization.

**TopTalent:** Which companies did you get an offer from apart from Microsoft, Redmond?

**Prashanth:** I received an offer only from Microsoft Redmond. I was interviewed by Google MTV (Mountain View), Epic Systems Wisconsin and Oracle California besides Microsoft Redmond. My interviews with Oracle were left incomplete due to lack of time. Although I had excellent interviews with Epic Systems, I asked the HR to not extend an offer to me as I was uncomfortable with the fact that they had an office only in the US, and therefore being unlucky in the H1B-visa lottery would make

the job offer worthless for at least a year.

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

**Prashanth:** I think toughness of an interview is subjective to a certain extent. Having said that, the toughest interview for me was undoubtedly the final interview for Google MTV. They asked me a challenging set of questions, mostly open-ended. Overall, I would say Google had the toughest interviews.

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

**Prashanth:** Preparation aimed specifically towards interviews was done in the 3-4 months leading up to the placement season. Apart from the resources I consulted, I also asked a couple of friends to suggest problems to think about during my free time. Whenever I encountered an algorithmic problem, I would try my best to solve it without consulting the web or a friend. Then I would code it up, since fast coding is often a great advantage during placement interviews.

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

**Prashanth:** I read a few chapters from "Cracking the Coding Interview" by Gayle Laakmann McDowell, which I would suggest as a first resource for anyone appearing for a coding interview. Besides the book, I used to look up online resources like GeeksforGeeks and Leetcode from time to time. The tutorials at topcoder are also a fine resource. For a couple of years, I had been solving problems from codechef, codeforces and topcoder sporadically out of interest which helped me break into the mindset of an algorithmic problem solver.

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

**Prashanth:** The obvious answer is, first and foremost, algorithmic problem solving skills. Additionally, I was working, at that time, on two significant, interesting projects which I was very enthusiastic about, and spoke enthusiastically about them to my interviewers which I believe was a non-trivial factor in creating a favorable impression.

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

**Prashanth:** For the interview questions, practice a lot of problems and don't feel lazy to practice writing code. In my case, the interviewers (from Microsoft and Google) were very interested to hear about the research work that I had carried out and was planning to pursue in my final semester. I would advise students to take an initiative to undertake projects that interest them, because it will give you an edge in the interviews.

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

**Prashanth:** I spent a considerable amount of time preparing my resume. My rule of thumb was to not exceed 2 pages. It is always a good idea to scrutinize your resume from the perspective of an interviewer and ask yourself how you can make it better, more concise, more appealing. Never claim to know something you don't. Do not be afraid to deviate from a fixed resume template (that your institute might suggest, for example) if you feel a different arrangement represents your case better. Advertise your achievements and projects well, and be thoroughly prepared to answer questions on every point mentioned in your resume.

**TopTalent:** Please add other details that you want our readers to know.

**Prashanth:** I want to emphasize a couple of points. First, always remember that the company you are interviewing for wants to hire you as much as you want a job offer from them. Remembering this simple fact helps in maintaining confidence and avoiding panic during the interviews. Second, never try to deceive the interviewer. Try to be as honest as possible and if you do not know something, admitting it is far better than any alternative.

You can [login and download](#) Prashanth's resume from TopTalent.in.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Microsoft  
Microsoft Interview

## Microsoft Interview | Set 27

Round 1: (1 h)

=====

Q1. Design a Garbage collector like java. How would you detect depended reference loop?

Hist : Class design, Cycle detection algorithms for disjoint graph( List of connected graph)

Q2. Find an element in a sorted rotated array in O(logn ) complexity.

Round 2:(1.h 15min)

=====

Q1. Given a sorted array having duplicate elements,how would you find first index of a given element in O(logn).

Write code for it. Change the condition to find out last index of that elements.

[ Hint Binary search]

Q2. You have a dictionary of words. Given a word, print all anagram are in dictionary . State the data structure to be used to solve this problem.

Q3. Design a Chip-Encryption system. Which will do following operation:

1. Take a word from user
2. Encrypt the word by some Private or public key cryptography or any other algo.
3. Transmit the encrypted word by TCP or UDp or SSL.

Design the class diagram using OOD. Which design pattern you are using to achieve this.

Round 3:(1.h 15min)

=====

Q1. In a plane n points (X and Y) is given. How will you find out maximum co-liner points. Extend this algorithms. it for point(x,y,z) in 3D plane.

Q2. Reverse a 32-bit integers. write code for it.

Q3. What the different issue in multi-threading ? What is the difference between mutex and semaphore.

Q4. You have a file with million words in it. Find most frequent 10 word in that file. Note that you can store all word in memory.

(Note : Min-Heap + List )

Round 4 :

Skipped ...

Round 5( 2h 30 min)

=====

Q1. You are given a Text, where all space, full stop and all punctuation mark is removed. You want to reconstruct the text by putting spaces between words.

A dict is given and following API is also given.

- a) Decide if the text can be converted a sentence with valid words or NOT.
- b) Find how many way you can do the reconstruction of the text.
- c) Find what is the minimum number of space can be used for this reconstruction.
- d) For case (c) find out the indexes where you suppose to put a space.
- e) Now recover the text to sentence in place .

Subsequent Question:

1. Why Greedy technique will not work for this?
2. yes ! Backtracking will work, what is the problem of using backtracking ?
3. Illustrate and explain how the solution is contracted from the Dynamic table ?
4. Write the correct working code for (c),(d),(e).

Q2. Given a BST, find out the minimum length form root to leaf with sum S. Note that:

- a) Path from root to leaf node.
- b) Sum of node of the path is S.
- c) if multiple such path exist, print minimum length path.
- d) What is advantage of BST rather than BT used for this algorithm, how it improve the performance. in BST, is it required to explore both side ?
- e) Write working codes for it.

Status: Selected ! (The interview call was for SDE-I, but they offer me for SDE -II(L61) position)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Microsoft

## Microsoft Interview | Set 26

### Round 1:

Questions about previous work, design patterns used in the previous work.

**Given two integers represented in Linked list format and now add these two lists and put it in the third list, at any point of time a node can have only one digit in it.**

With the discussions it came like by considering the carry forwards and all similar to some of two integers represented in a linked list fashion. Interview asked to tell the approach first then for coding

```
// Approach 1
// 1 2 3
// 1 2 8 9
// 1 4 1 2
```

Version 1:

```
private static void Add(Node head1, Node head2)
{
    int res = 0;
    if (head1 != null)
    {
        count++;
        Add(head1.Next, head2.Next);
        count--;
        res = head1.Data + head2.Data + carryFwd;
        carryFwd = res / 10;
        Node newNode = null;
        newNode = new Node() { Data = res % 10 };
        if (head3 == null)
        {
            head3 = newNode;
        }
        else
        {
            newNode.Next = head3;
            head3 = newNode;
        }
    }
}
```

```

// happy with this logic where the list will go in
// reverse direction something like Insert at the head
// position every time a new node occurs to be created
}

```

Version 2: asked me to take an example and prove the solution is correct

One of my test case failed if the last digits also give the carry forward

```

static int[] aa = new int[3];
static int carryFwd = 0;
static Node head3 = null;
static int count;
private static void Add(Node head1, Node head2)
{
    int res = 0;
    if (head1 != null)
    {
        count++;
        Add(head1.Next, head2.Next);
        count--;
        res = head1.Data + head2.Data + carryFwd;
        carryFwd = res / 10;
        Node newNode = null;
        if (count == 0)
        {
            newNode = new Node() { Data = res };
        }
        else
        {
            newNode = new Node() { Data = res % 10 };
        }
        if (head3 == null)
        {
            head3 = newNode;
        }
        else
        {
            newNode.Next = head3;
            head3 = newNode;
        }
    }
}

```

Version 3:

This will save last digits sum in a single node this is not what I have expected when the sum is of two digits, so please fix the code

```

private static void Add(Node head1, Node head2)
{
    int res = 0;
    if (head1 != null)
    {
        count++;
        Add(head1.Next, head2.Next);
        count--;
        res = head1.Data + head2.Data + carryFwd;
        carryFwd = res / 10;
        Node newNode = null;
        newNode = new Node() { Data = res % 10 };
        if (head3 == null)
        {
            head3 = newNode;
        }
        else
        {
            newNode.Next = head3;
            head3 = newNode;
        }
        if(carryFwd ==1)
        {
            newNode = new Node() { Data = carrFwd };
            newNode.Next = head3;
            head3 = newNode;
        }
    }
}

```

Version 4:

Can u optimize more here...? What is the maximum when you add two digits...? What are the possible values for the carryforward...? Back to back questions

So the final version of mine is removed the count variable and moved the last condition of carryforward to outside of function. He created more fun here that why he is digging so deeper.

```

public class Node
{
    public int Data { get; set; }
    public Node Next { get; set; }
}

```

Now write the test cases for this problem.

Around 15 test cases means test inputs. I had written by looking at my solution.

The question here is do u write the test cases for your solution or for the problem, consider this is not your code you have been given a problem and write the test cases.

Then I added some of the test cases by ignoring my assumption of equal length of list.

Asked to some more to write was happy when I had written a test with linked list size of 10000000 as my solution is recursive I may get the stack overflow exception.

With this answer he banged me with lot of questions.

**Interviewer:** Then why do you choose recursion I need an alternate approach not happy with one alternate

```
// Approach 2
/*
 * Reverse list 1:
 * Reverse list 2:
 * Add the lists with remainder and dividends
 * Reverse list 3:
 */

// Approach 3
/*
 * make the linked list to array and use the indices to
 * traverse and do the addition
 * No program is asked for it
 */

// Approach 4
/*
 * mConvert the entire linked list to an integer and then
 * add both the integers and then prepare a linked list
 * with the result
 * but the issue if the result is out of integer boundary
 */
```

When I told approach 4 he asked me

**Interviewer:** "Are you thinking that why this guy is saving integer in linked list and then asking me for addition of such lists...?"

**Me:** Yes

**Interviewer:** then answer yourself what is causing me to do this way, lets exchange the roles

**Me:** told some scenarios like

1. want to have index based integers and growing dynamically (so arrays won't be friendly)
2. If I want to have a counter which value is more than the range of integer then I can go with this or some other data structure.

**Interviewer:** Now lets go back to the question again and then fix your code by ignoring your assumption of equal length of lists

**Me:** the above approaches 3 and 4 can solve

Interviewer: but these are alternate approaches to solve any means of fixing the same solution instead of going with the alternate?

**Me:** May be I'll pad the smaller list with the zeros and then use my algo extra overhead initially but it works.

**Interviewer:** Ok Back to your solution Recursion why did you jump and started with the recursion when u have these many alternates...?

**Me:** I usually think of recursion when someone ask a question in linked list which will solve sometimes easily as it is unidirectional.

**Interviewer:** can u elaborate more how recursion will ease the developer logic

**Me:** It uses internally tree through which I can perform operations in reverse direction in a linked list

Viji: What tree does it maintain?

**Me:** Name is some RecursionTree but its not actually a tree

**Interviewer:** Then what is that

**Me:** some data structure

**Interviewer:** offcourse what is that data strucrue

**Me:** I hope its stack as it is working LIFO fashion so I can do the reverse operation easily. That's why one of my test case checks for Stack overflow exception as I used recursion when I have huge data.

**Interviewer:** What is LIFO

**Me:** explained about the LIFO and compared with the FIFO.

**Interviewer:** Any questions to me ...?

**Me:** If it is not confidential and obvious tell me what is the core logic or algos used in Bing, as my manager told this is for bing team

**Interviewer:** ok if you want to write an algo for a search whats ur approach

**Me:** I'll go with some Heuristics based search, like Best-First search kind of A\* algorithm or TSP (Travelling sales person) problem solution.

Interviewer: if that is the case anyone can write a search engine we also use some heuristics but never be like straight A\* algo

And some discussion on Google Vs Bing and then That's all from my side and you may be part of Bing relevance team once we talk with other guy.

**Round 2: lasts for 1:30 min**

**Interviewer:** will start directly with the question without wasting time.

Given an array of +ves and -ves find a sub array which maximum is max among all the sub arrays of any length in the given array.

Tell the approach first and then write the code

**Me:** After some time told the approach with O(n) complexity then he asked me to write the code

```
int len = sizeof(arr)/sizeof(arr[0]);
int currMax = a[0], finalMax = arr[0];
for (int i=1;i<len;i++) {
    currMax += a[i];
    if(currMax > finalMax)
        finalMax = currMax;
    if(currMax<0)
```

```
currMax =0;  
}
```

**Interviewer:** Take some numbers and prove that your solution is correct

**Me:** Shown with the example I need to traverse for the entire list till I get the answer.

**Interviewer:** Does it fail in any scenario?

**Me:** no never

**Interviewer:** It will fail if all the numbers in the array are -ve

**Me:** but initially the question was the array is mix of +ve and -ve

**Interviewer:** Ok then let me change the question and consider it has all -ves then does your code fail if so where?

**Me:** yes it will with condition of currMax

**Interviewer:** then fix

**Me:** took lot of time to fix and then asked me to prove the correctness

I couldn't prove my solution as I lost somewhere while I was tracing with the big list but the solution was correct, So

Interviewer: he asked me to change the initialization and fix that is the hint

**Me:** I couldn't fix as I was stick to my solution, but I gave an alternate approach like

I'll multiple all -ve numbers with -1 and make the list is full of +ves and then find the minimum of sub array instead of max once I got I'll make it is a -ve number before return or print

**Interviewer:** very keen on what is the return value of the function which I wrote; and he told you are going to the alternate solution instead of fixing the existing solution

**Interviewer:** ok lets go to another question given a tree find the ancestor

**Me:** meaning parent, grand parent, or grand grand parent

Interviewer: does it matter for you? And what is your approach for say grand parent

**Me:** I said may be I'll go with stack and based on your option I'll peek the node from stack

**Interviewer:** Ok we will go to some other question instead of this.

**Interviewer:** I'll draw a tree on a paper and give that to you take your own time and remember the tree in a data structure and once you say yes I'll wipe out or take my paper back then consider the data structure is input to your algorithm and then construct my tree back

**Me:** I couldn't understand the problem asked too many questions what he really want like I'll construct the tree by using your tree and then call the same function to recreate

**Interviewer:** how do you create what is your input what is the data structure is that

**Me:** I said Node blah blah ... asked too many questions then I understand what he wants

So my approach was I'll represent your tree in two arrays one will be Inorder and other will be pre/post here I'll go with Pre and once I have these two arrays I can go with the construction algo by giving these as inputs.

**Interviewer:** tell me the approach how do you construct if you these two arrays

**Me:** I told combining these two how we can go and construct like from inorder we can get the root element and find that root in the second array and then split the array which is same as left and right of the root and proceed further; this I need to do it manually for the given tree to prove my solution; and he asked couple of questions after splitting where the sub arrays will go and how do you remember that what is left n right; manually I explained all these with the example and I said don't know what condition need to check when I write this as a program

**Interviewer:** happy with the approach and asked what In/Pre/Post orders why did you choose only these two

**Me:** I need Inorder and you can tell me which one do you want me to take either pre or post

Interviewer: its up to you, your algorithm or data structure and write the program

**Me:** I was not able to put my logic in the code as I couldn't get the proper conditions tried in normal way as well as recursion but couldn't make a concrete code at all.

**Interviewer:** we are running out of time so will stop here.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Microsoft

## Microsoft Interview | Set 25 (On-campus for Internship)

### Microsoft IDC Internship Selection Process

Hi everyone! I sat for Microsoft IDC Internship Selection Process. The whole process comprised of 6 rounds as follows:

#### Round 1

This round was taken on-campus and it included 15 aptitude questions containing mostly problems related to general programming in C. The round was hosted on CoCubes.com. 46 students were shortlisted from around 150 students.

#### Round 2

This round was also taken on-campus and hosted by CoCubes.com. We were given to solve two coding problems on an online judge. The questions were:

1. To check a tree is BST or not.
  2. Change one string to another with minimum number of changes (Sorry! I don't remember the exact one).
- 22 students were shortlisted from this round.

#### Round 3 (Telephonic)

The interviewer started with the introduction and went on asking questions from my resume. You must prepare your resume well and go through it thoroughly. Then after asking questions from my resume for around 20 minutes he asked a coding question. The question was:

Given a series of numbers, print which number is repeated how many times?

I gave brute force solution first by using arrays. Then he asked if we have million of numbers and negative numbers as well then which data structure will be used. I said hash table. He asked certain questions on hashing. Then he said if don't care about time complexity and want to find in-place solution then what will be another method. I said first sort it and then count.

He appeared to be impressed and I was selected for the 4th round. From our institute 9 students were shortlisted for the next round. For next rounds students from all over the country were called to Delhi and Bangalore. I was called to Delhi.

#### Round 4

There were around 60 students. They were divided into two groups of 30 each. I was in the latter group of 30. We were given two coding questions to be solved on paper. The questions were:

1. Compress a string in-place.
2. Define BST. Check a tree is BST or not.

A total of 5 students from us were selected and I was lucky enough to be one of them. 10 students were selected from the former group of 30 students.

#### Round 5 (Personal Interview)

The interviewer started by asking a coding question: Given a rotated array, find the first element of the former un-rotated array. Then he asked some questions from Operating Systems. He then asked how to implement a queue from stacks.

I was not lucky enough to clear this round but it was a motivating experience.

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Microsoft

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## Microsoft Interview | Set 24

Hello everyone, I recently got selected for the internship at Microsoft IDC. GeeksForGeeks helped me a lot in preparing for the coding tests as well as for interviews. The positions that they were interviewing for were SDE and SDET(Testing).

### 1st Round. – Online – 30 mins

The first & second rounds were online rounds which were hosted on cocubes.com . There were 15 MCQ questions. For me most of the questions were from C++, C. For others very few questions were from microprocessors, aptitude.

### 2nd Round. – Online – 30 mins

This was a coding round in which two problems were given.

**Problem – 1:** Given a singly linked list,in which the last node points to the middle node,delete the middle node and remove the loop.

**Problem – 2:** Given an array of size n, find the majority element.Majority element is one which gets repeated for more than  $n/2$  times.

### 3rd Round –Telephonic interview- 45 mins

1. Tell about yourself? [Don't tell ur fathers name, etc tell about ur

Hobbies, extra-curricular activities, accomplishments, ur strengths, ambition, etc..]

2. Tell about any challenging task that you met in your life.[I told about the difficulties met in my project, it took 30 mins]

3. Tell about your achievements.

4. What is a good coding.

5. Why do you want to work for Microsoft?

6. Any questions?[Ask some interesting questions,it is a plus]

### 4th Round – Interview[conducted in Bangalore IDC]-45 mins

1. Given an address of a node in a singly linked list,delete that node.

2. Find the nth node from the end of a singly linked list.

3. Check whether a binary tree is a BST.

4. About project.

5. Any questions?

### 5th Round – Interview[conducted in Bangalore IDC]-30 mins

1. About project

2. Why do you want to work for Microsoft?

3. What is the disadvantage that you think that gmail has?How will you overcome it?[for these types of questions if you have not used the product for which you were asked to find a disadvantage, you can tell the interviewer so that they 'll be suggesting you some other product]

4. Insert a node in a doubly linked list.

5. Any questions?

### 6th Round – Interview[conducted in Bangalore IDC]

1. Given a rotated array which is sorted search for an element in it.

2. Why do you want to work for Microsoft?

3. Tell about your strengths.

4. Any questions?

#### My tips to crack Microsoft interview:

While answering the questions remember the following:

1. Be yourself.
2. Show excitement and interest in solving the questions.
3. Think aloud.
4. Clarify doubts regarding the question.Don't assume things.
5. Cover all the test cases in your code.
6. Don't interrupt.
7. Be up-to-date about the company.This will help you in asking some interesting questions about the company.

8. Don't write about things that you are not sure about in your resume.
9. Enjoy the interview.Don't be nervous.

**Books and websites that I referred:**

1. [www.geeksforgeeks.org](http://www.geeksforgeeks.org)
2. **Cracking The Coding Interview** by Gayle Laakmann McDowell (a very good book) If you get selected for internship, you also have a chance to get converted into an employee over there,if you do the project given there well and if you perform well in the interviews that they will be conducting after completing your project.

All the best!!!

I would like to thank GeeksForGeeks for mainting a high quality problem set for coding tests and interviews.

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Interview Experiences  
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### Microsoft Interview | Set 23

**Written Test:** First round was an online test on cocubes platform (not good for coding). This test is based on C, C++ and DS. The shortlisted students in this round were selected for next round which is coding round. Coding round had two questions:

- 1) In a Tic-Tac-Toe game two players are playing where player 0 is denoted as 0 and player 1 is denoted as 1. Given a linked list of moves made by the players ,determine who is the winner and in how many moves he required for winning.

```
Struct Move {
    int p; //Player number
    int x; //x and y pos in the tic-tac-toe
    int y;
    struct Move *next;
};
```

- 2) Given an array if in a position let  $a[i][j] = 1$  then print all it's row and column 1. You should not consider a position 1 after you made it 1 in your past computation.

Note: In this question it is asked to not use any extra space.

```
sample(input):
(i) 00100      (ii)10
 00000        01
output:
(i) 11111      (ii)11
 00100        11
```

**Group Fly/Activity:**

On the day of interview just before couple of hours we had a group fly in which we will be given two simple questions. We need to discuss our approach with our mentor.

- 1) Check if a binary tree is balanced or not.

- 2) remove duplicates from a string inplace.

The questions in this round will generally be pretty simple but an error free(handling all boundary cases) and completely optimized code is expected. Without this, it is very difficult make to next round.Test cases were asked for each and every question below. It is important for you to cover majority of the cases.

**Interview Round-1:**

- 1) Interviewer asked me to optimize the code for the question 2 in previous round (Not in terms of complexity but in terms of number of assembly instructions, time taken to execute each instruction)

- 2) Some simple questions based on LL. Sorry I couldnt recollect

- 3) Recognize power of two using bit operations

**Interview Round-2:**

Here I had only one question.

- 1) A node which has following fields

```
a) data
b) next_ptr
c) prev_ptr
```

can be used to represent doubly linked list, binary tree or none. Given a random pointer recognize whether it forms DLL, Binary Tree or none. I pointed out that for Binary tree root node has to be given then he asked me to assume the same.

Keep on discussing your approach with the interviewer, they will generally guide you to the solution.

**Interview Round-3:**

My performance in round2 was a bit shaky and this round was a kind of eliminator.

- 1) 2 numbers each represented by linked lists, write a function which gives difference of these numbers.

- 2) Consider a webpage which has a big single image and another page in which the previous image is divided into 6 parts, which one loads faster?

Now propose a solution reducing the loading time.(There are no bounds for this question to think, I proposed a solution which includes concepts from vision, networks and multimedia. The interviewer was very much impressed and immediately told me that I am going to have a next round)

**Interview Round-4:**

Here I had 5-6 questions. I didn't remember all the questions but you should be able to do it if you follow GeeksForGeeks.

1) Copy a linked list with next and arbit pointer.

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

I told him that I knew this question, then he asked me for the approach and test cases and moved to the next question.

2) Given two sorted arrays. Second array has enough extra space to accommodate elements in first array. Give the resulting sorted array obtained by merging two arrays without using extra space.

3) Consider a binary tree for which root node and a target node are given to you. Give the next sibling of the target.(let the target be in level k, then you need to give the immediate node which is in level k)

Other questions were based on arrays, linked lists and binary trees (mixture of these).

All the interviewers were very cool, helpful etc etc... They understand our tension and try to make us feel as comfortable as possible. The first interviewer even put his arm over my shoulder during our little walk from canteen to interview room.

And yes hired!!! Thanks to GFG.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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Microsoft

## Microsoft Interview | Set 22

Hi, PFB my on campus interview experience with Microsoft.

### Written Test:

First round was an online test which contains 20 MCQs on C & C++. Based on this test, they shortlisted some students and the next round was taken. The next round was a coding round which had two questions:

Q1. Print last 10 lines of a very large string.

Q2. Trim all the nodes in a BST which are not in the range of (minValue, maxValue).

The codes were checked on their online compiler with their test cases.

### Group Activity:

The night before the day of interview, we had a group activity round. We were given to solve one question on our own, and the other one we had to solve discussing with Microsoft mentor allotted to you.

Q1. Insert an element in a sorted circular singly linked list. Pointer to any node of the list (may be denoted as the head) and pointer to the new node will be given as input. Generate test cases for your code. Check for all corner cases.

Q2. An MxN matrix is given. If a cell contains 0 (zero) make that row and column zero. We had to discuss this question with Microsoft mentors. Discussion was important and they pointed out flaws and ask you to optimize algo (Space complexity).

### Interview Round-1:

Q1. After a brief introduction the interviewer asked me to solve the puzzle of 100 bulbs. There are 100 bulbs (initially all switched off). At i-th iteration all the switches of i's multiple are flipped. Finally, after 100 such iterations, how many bulbs will be still switched on?? I didn't know the solution. The interviewer gave me a hint. Then after doing some maths, I finally gave him the solution (Perfect squares). Then he asked me to prove it. Somehow, I proved it (I was feeling lucky :P).

Q2. In continuation to the previous question, he asked me to write a function which will take a number as input and return all of its factors. I solved it in O(sqrt(N)). Then he asked me to check whether I missed any edge case. So, I put a checking for negative numbers. He was happy with it.

Q3. Then he asked me to write the code for DFS traversal of a tree. I asked him about the tree structure. He told me to write for an N-ary tree. Did it, using a vector (C++) of children pointers. This time, I didn't miss a corner case (coz, there was almost none :P). He was happy with it.

### Interview Round-2:

Interviewer was very cool and very frank. He went through my CV thoroughly asked me one question in SQL and two algorithm questions:

Q1. He gave me an Employee table with Id, Name and ManagerId columns in it and then asked me to write an SQL statement which will output all the manager names who have at least 2 subordinates under them. I know, it's very easy :P.

Q2. He asked me to write the code to clone a singly linked list with next and random pointer and told me not to worry about any space complexity. A fairly easy one. Solved it using a hash.

Q3. In continuation to the previous question, he asked me to rewrite the above code without using any hash. Did it very quickly :P. He was really happy and chatted with me for a while. I even chewed a gum after taking his permission. He was very impressed by my handwriting. Yeah you heard me right, I was feeling lucky :D.

### Interview Round-3:

Interviewer was funny and he continuously asked me not shout (though, I really wasn't in a mood to shout ;)).

Q1. He asked me to write a function which will connect all the nodes in a binary tree at the same level. I told him, I knew it and explained it in brief. He was cool and asked me whether I wanted to have a new question or just write this one. I said, "As you wish". So he moved on.

Q2. He explained an use case of MS Excel: we can select multiple columns in excel file and drag them together left or right. He then asked me to write the code to implement the aforementioned scenario on arrays. The input will be, an array, left and right index of a sub-array (multiple columns) and a destination index (either in left or right of the sub-array). After scratching for a few moments, I gave him an O(n) solution with left and right shift using flip method. He was really impressed and praised my handwriting once again (God is great ;)).

Q3. He quickly moved to the last question. A file with numbers from 0-9999999 (each number in a line) is given. How to sort the content. I gave him a solution with radix sort (as maximum 7 digits are possible for each number). Then he posed a constraint of very less RAM available. I discussed a modified external merge sort like algorithm with him. But then he told me to minimize the huge time taken by external merge sort. Then he gave a hint as "Use bits". So I told him, to use a  $10^7$  size vector (which actually uses one bit for one boolean). He was okay with it.

Finally I was HIRED !!! 😊 😊

I am really really grateful to the geeksforgeeks team. How much I say about it, it will definitely be less. Keep up the great work

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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## Microsoft Interview | Set 21

Hi, a brief documentation of my Microsoft experience is as follows:

### Group Activity:

On the evening before the interview we had a group activity round. We were given to solve one question on our own, and the other one we had to solve discussing with Microsoft mentor allotted to you.

Q1. Insert an element in a sorted circular singly linked list. Pointer to any node of the LL will be given as input

Q2. A matrix  $m \times n$  is given. If a cell contains 0 (zero) make that row and column zero.

We had to discuss Q2 with Microsoft mentors. Discussion is important and they point out flaws and ask you to optimize algo.

### Interview Round 1:

Q1. Asked me to solve Q2 of group activity without using extra space.

Q2. Given an array of digits, form two numbers from those digits such that sum of those two numbers are minimum

Q3. Given an array of numbers, find out the minimum distance and print all the pairs with minimum distance

### Interview Round 2:

Q1. Two string S1 and S2 are given, check whether S1 is a shifted version of S2

Q2. Write KMP/ Rabin-Karp for substring matching

Q3. Given a pointer to a circular linked list, delete that node

### Interview Round 3:

Q1. Given a set of rectangles of varying length and breadth, find out the maximum height stack you can form with them such that if rectangle R1 is on top of rectangle R2 then length(R1)

## GATE CS Corner Company Wise Coding Practice

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## Microsoft Interview | Set 20 (On-campus for Internship)

Hello everyone, I recently got selected for the internship at Microsoft IDC. GeeksForGeeks helped me a lot in preparing for the coding tests as well as for interviews. The positions that they were interviewing for were SDE and SDET(Testing).

### 1st Round – Online – 30 mins

The first round was an online round which was hosted on cocubes.com . There were 20 MCQ questions. Questions were from a variety of topics like Algorithms, Data structures, C, C++, OOPs, Memory Management, Computer Architecture etc.

### 2nd Round – Online – 1 hour

This was a coding round in which two problems were given.

*Problem – 1:* Given a word and a text, return the count of the occurrences of anagrams of the word in the text.

For eg. word is "for" and the text is "forxxorfxdofr", anagrams of "for" will be "ofr", "orf", "fro", etc. So the answer would be 3 for this particular example.

*Problem – 2:* Given a binary tree with parent pointers, find the right sibling of a given node(pointer to the node will be given), if it doesn't exist return null. Do it in  $O(1)$  space and  $O(n)$  time.

### 3rd Round – Group Test – Code on paper – 45 mins

First we had to discuss the solution with the assigned mentor and then we had to code it on paper(no pseudo code)

*Problem 1:* Given a BST, one of the nodes violates the BST property( left-child Problem 2: Two no.s having equal no. of digits were given in the form of singly linklist. (For eg.- 102 will be given as 1 -> 0 -> 2 ). Add these no.s and return the answer in the form of a singly linklist. Do it in  $O(n)$  time, given  $n$  digit numbers

### 4th Round – Interview

I had to implement a T9 dictionary . insertWord function and populateWords were the two functions which I had to implement on paper(again no pseudo code).

First I have to discuss the approach with the interviewer and then he asked me to code.

#### 5th Round – Interview

He discussed the work that I did in my last summer internship and after that he asked me to code the maximum subarray problem in one pass.

I and my friends who got internships at Adobe Research, Amazon, De-Shaw, Samsung would like to thank GeeksForGeeks for maintaining a high quality problem set for coding tests and interviews.

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## Microsoft Interview | Set 19

I recently got interviewed for a position in Microsoft, following is my interview experience.

#### Round 1 (Telephonic):

Started with my introduction followed by my work in existing company.

- Given a circular doubly linked list, delete a given element. He was looking for all the corner cases

#### Round 2

1. Given an integer array find largest sum of elements which is continuous (kadane algorithm), Later asked to make code changes to find the array also. Also asked to give test cases for the same.

2. Given a design of an application, comment/recommend the changes to be done

#### Round 3:

- Given two linked lists check if they intersect??
- Test cases to test an ATM

#### Round 4:

- Find least common ancestors of a binary tree ( I said I know this, he moved to next question)
- Check if one array is subset of other ( discussed different methods like hashing, sorting ), asked to write a sorting function also
- Design questions related to the team they were interviewing for.

Finally I got an offer from Microsoft, they are very pleased with my performance. All the interviewers are very friendly. Thanks a lot geeksforgeeks, with out your help this would not have been possible.

This article is compiled by Chandrakanth. Many Many congratulations to Chandrakanth 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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## [TopTalent.in] Interview With Nandini from VNIT Who Bagged an Off Campus Job in Microsoft



It is not just intelligence but intelligence coupled with inherent confidence is what makes a person truly remarkable. It is these truly remarkable people who go that extra mile to achieve their dreams. Nandini Yeltiwar, a student of VNIT Nagpur, bagged a job in Microsoft India, not through campus placements but through the off-campus employee referral channel. She was happy to share her experience with TopTalent and gave us some interesting insight into how she landed a dream job in one of world's top software companies.

So here is her interview where she talks about the Microsoft interview process and how she landed a job there. Don't forget to [download her resume](#) by logging in to understand what makes her special.

**TopTalent: Can you describe the hiring process in detail?**

**Nandini:** We had applied off-campus through employee referral and we were initially shortlisted based on our resumes. The first two rounds were an aptitude test followed by a coding round test in which we were required to give syntactically correct code. The coding round had short basic coding problems. After each round some

applicants were eliminated. People shortlisted from coding round had a phone interview which had mostly behavioral questions. They went through our resume and asked us questions on internships. Some of us were even asked technical questions in this round. Those of us who cleared the phone interview were called to the Microsoft IDC campus in Hyderabad for the technical rounds of interviews. There were three rounds which focused on each of the different positions for freshers which are Software Development Engineer and Software Development Engineer in Test. The technical interviews mainly stressed on data structures and algorithms. One round was entirely focused on testing. For each proposed code we need design test cases and hence verify the code.

**TopTalent: What skills according to you was the company looking for in candidates?**

**Nandini:** The company looks for candidates who are strong in algorithms and programming and have good problem solving ability. They'll start off with simple problems and they'll keep adding more conditions to the problem. They require you to be good at optimizing the answer and modify the solution after each condition that is added. You need to be good in communicating your logic to the interviewer. In case of testing, they expect you to cover all boundary and special conditions.

**TopTalent: What was that x-factor which might have helped you over others?**

**Nandini:** My final year project was on testing a software produced by a company. I feel that this made me a good fit for the testing profile since I studied quite a lot about testing due to the project. Apart from this, I had practiced a lot of coding questions, available on Internet and through various books, before the interview which helped me in clearing technical interviews successfully. I had given quite a few interviews at campus before appearing for Microsoft, which helped in handling interviews well.

**TopTalent: How important are resumes in the whole process?**

**Nandini:** The initial screening was based on our resume. However, the resume is not very important once you start the interview process, though a striking resume always helps. It's alright if you do not have impressive internships and projects. They don't expect rocket science from freshers. They do ask questions on the projects and internships listed on the resume in the phone interview so be well versed with all the projects you mention. You need not have a lengthy resume mentioning every small thing you did, but a short one having the major things. Whatever you mention in the resume you need to know it well in order to answer any type of questions on it.

**TopTalent: What tips you can give which might help others applying to similar jobs?**

**Nandini:** I would recommend practice. Improve and practice coding problems, basic data structures and algorithms. During the interview there won't be any compiler or syntax highlighter, so be proficient in writing code on paper or a white-board. Always communicate your logic to the interviewer. Sometimes they may forgive stray syntax as long as your logic is sound. You will be asked some testing questions which you need to crack even if you aren't interested in the Testing profile. For such problems, develop test cases based on the requirements of the software. During interview keep telling the interviewer the ideas or the way with which you are thinking to solve the problem, this is always appreciated and they can even help you in case you get diverted from the proper way of solving.

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## Microsoft Interview | 18

Following is my experience of MS **intern** interview (location Hyderabad).

**No. of Rounds:** 3 rounds of PI

Microsoft short-listed candidates based on their Resume and there was no written test. Complete process included 3 interview rounds

**Interview Round 1:** Time 1 Hr. (Bing Team)

1. Implement a stack having **findMiddle** operation as well, which returns middle element of stack on O(1) time.
2. Given notes of different denominations ( 1,2,5,10 ) , WAP to find in how many ways can you make an amount 'x' ?

**Interview Round 2:** Time 1 Hr.. (Apex Team)

1. Given an array of size n , having numbers from 1..n , with one number missing and one occurring twice. Find the 2 numbers
2. Given a number having only one '1' and all other '0's in its binary representation, find position of bit which is '1'.
3. Code for Iterative in-order Traversal of a tree.
4. Questions from OS ( Physical Memory , Virtual Memory, Interrupts, message passing , etc.)

**Interview Round 3:** Time 15 Mins (Apex Team )

1. Code to remove alternate duplicate characters from given string.
2. Some HR like questions ( Why do you see yourself 5 yrs. down the line)

I was lucky, and got the intern!!

This article is compiled by Nitin Khandelwal. Many Many congratulations to Nitin 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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## Microsoft Interview | 17

Recently i was interviewed for Build Team Engg. role in Microsoft hyderabad. I was selected.

I am really thankful to GeeksForGeeks site which gave me motivation and will to prepare for the company, with the help of material on the site only I got selected.

**Written:-**

3 D.S questions

**Q1** – Rotate an array by K.

**Q2** – Reverse a link list. If you are able to reverse a link list than reverse the K node's of link list.

**Q3** – Find the pair of values in the array whose sum is equal to K.

**First Round of interview –**

Was asked to come up to an optimal solution for all the above three questions in the written.

**Second Round –**

Some general discussion about my projects and some curriculum subjects.

**Q** – Two numbers are stored in link list, need to add those two number.

I was also asked to write the test case which breaks the code.

**Q** – how does the telephone directory search of nokia phone works. If i give a name it should get me the contact number and vice versa.

**Third round –**

Some general discussion on the projects.

**Q** – I was asked how search of windows work and asked to give a good indexing scheme for that.

**Fourth Round –**

Some general HR question like 1. why this company? 2. Why leaving your old company?

**Q1** – Given an array which contains a number in majority (i.e. A number occurs more than 50% times in the array) need to find it.

**Q2** – Given an array which is rotated N times(N is unknown), I need to search a number in it.

In each and every question they were looking for an efficient solution and if I was getting stuck somewhere they were also giving hints.

This article is compiled by Love Gupta . Many Many congratulations to Love 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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## Microsoft Interview | 16

I was interviewed for Microsoft App-Ex Team. I was selected. I am really thankful to GeeksForGeeks site which provides preparation material for technical interviews organised so well at one place. I am fan of you guys

**Round1:-**

a) Implement your own atoi() function(To convert string to integer) cover all the cases including negative integer.

b) LCA for Binary Tree. Write code for it.

c) WAP to Print last n lines of a big log file.

**Round2:-**

a) You are given an array containing only 3 type of characters let say a,b,c write a program to sort the array having these. Eg abcaacbbaaaaccc sort it. I gave standard 3 flag solution then he asked you are complicating it you can use other method then I gave counting method. He asked me to compare the complexity of both methods. then discuss leads to while calculating complexity we compare number of iteration only or total calculation in the program.

then he asked if we have let say k type of character then which method is good the count one or three flag one.

b) Implement T9 dictionary. how T9 works is : let say if I press 223 it should give all the possible valid words in suggestion Eg bad,cad,aad etc. give datastructure to store valid words etc.

**Round3:-**

This round was with hiring manager

a) Write code for merge two sorted LinkedList Inplace.

Then He gave a problem related to his team. In weather app, you have a number of weather stations, give datastructure and all to find the nearest weather station from a city.

Then He gave the brief about what his team work and all .

**Round4:-**

This was with GM of App-Ex team India.

a) It was a design question. You are given a list of components you have to write design for rendering those components in container. Layout can be left aligned, right aligned, center aligned. You design should be extendable means if new layout comes you should modify your code as least as possible. Use concept of OOPS.

This article is compiled by **Vishal Gupta**. Many Many congratulations to Vishal 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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# Microsoft Interview | 15

I recently had interview with Microsoft and i have been selected.

I am really thankful to geeksforgeeks site which provides preparation material for technical interviews at one place. And credit of my selection also goes to my friend "Ankit Tripathi" who helped me a lot in my preparation.

I have attached my interview experience file with this mail.

**Written Test:** 30 MCQs based on Algorithms & logical aptitude and 2 coding problems.

**Telephonic Interview:** All questions related to your resume & projects and some behavioral questions.

## Round 1:

Ques1. Write code for run-length encoding of a given string in-place (without using any extra memory).

Sample Input:aaaaaaaaaabcccccc

Output: a10bc6

Ques2. Write code for a function which converts a given integer to a string. (Use only one for-loop). Check for all the boundary cases.

Ques3. Suppose you are going to organize a party from 9:00 am to 20:00 pm. You have invited 'n' number of guests for the party. You are given the arrival time and the departure time of all guests. Every time a new guest arrives, you give him a glass of wine and when he leaves, you take the glass back. If someone has left and returned the glass, you can give the same glass to a new guest who has just arrived.

Based on the given schedule for guests, determine the minimum number of glasses required for the party. A guest can come or leave at any time, but you are given the fixed schedule. Write code for the given problem.

## Round 2:

Some questions related to resume and subjects studied in the curriculum.

Ques1. How can we do a Tree Traversal without using a stack (not even the stack for recursion). Write code for an in-order traversal without using stack. What would be the changes in the function if we want to do a pre-order or post-order traversal?

Ques2. Write code for finding loop in the singly linked list and fixing it.

Ques3. Given a linked list with two pointers, one is next pointer and another is a random pointer which can point to any node in the list (forward, backward or itself), you have to make a copy of this list without tempering the original list. Write the code for the same in O(n) time complexity.

## Round 3:

Ques1. Give different possible approaches for Checking whether two strings are anagrams (with and without using hash tables). What are the possible advantages and drawbacks of each approach? Write code for the approach which involves first sorting the two strings and then matching character by character (O(nlogn) approach). Which sorting you will use and why? Write test cases also.

Ques2. Write code for counting the number of inversions in an array in the minimum time possible. What could be different possible approaches?

Ques3. Given two huge numbers represented as linked list, write a function to add them and return a number in the same format.

Ex: 950 represented as 9->5->0->NULL

150 represented as 1->5->0->NULL

then, the output should be 1->1->0->0->NULL

Ques4. We have 'n' people in a party, out of whom only one can be a celebrity. And he may or may not be present in the party. A celebrity is known to everyone but he does not know anyone. All other person may or may not know each other. If a person 'A' knows 'B', it does not implies that 'B' also knows 'A'. You can ask only one question to someone 'Do you know this ('X') person?' and he can only reply in YES or NO. Your job is to find the celebrity in minimum number of questions.

## Round 4:

First he asked general questions from resume.

Ques1. Write code for finding the least common ancestor of two given nodes in a binary tree. ( both recursive and iterative approach).

Ques2. Which data-structure you will use for implementing the 'malloc' and 'free' functions? (You have been given with a pointer which points to a large chunk of memory). Write full codes for implementing these two functions.

Each face-to-face round duration was approximately 1 hour. Results were declared after 4 days of interviews. Every interview was an eliminating round. Questions were not very hard but they were very keen on accuracy and efficiency of code (it should run on all possible input cases).

This article is compiled by **Monika Bisla**. Many Many congratulations to Monika for her 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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## [TopTalent.in] Interview with Sujeet Gholap, placed in Microsoft, Google, Samsung, Goldman Sachs & Tower Research



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 Sujeeet 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](#) had a chance to interact with Sujeeet 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, Sujeeet 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](#) his resume by logging in.*

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

**Sujeeet:** 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?**

**Sujeeet:** 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?**

**Sujeeet:** 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!

**Team TopTalent: What was going through your mind when you had to choose one out of those 6 offers?**

**Sujeeet:** 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.

*(Wasn't really a surprise for us. Google seems to be the first choice for most Indian programmers)*

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

**Sujeeet:** 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 problems, 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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## Microsoft Interview | 14

My name is Ravi Chandra. Today I have attended Microsoft interview in Bangalore. I was referred by a consultant. Interviews were conducted for various positions in various teams in Hyderabad development center.

I was not able to clear the first round. But let me share the question I faced to the readers of geeksforgeeks.

Question:

All the phones stores contacts in some way. Primitive phones has less memory and less processing power. So design a data structure which stores the contacts. This should use as less memory as possible and support the algorithm to run efficiently. Basic operations on this data structure is given a number, how to lookup contact name and vice versa.

Initially I gave a hashmap solution. But he said hashmap operations are costly because of collisions etc... and asked me to provide a better solution. I proposed a linear search. But he wants a better search algorithm.

Unfortunately the better answer struck me when I came out of the interview room.

That solution is like this. Assume each contact record has unique index value. Let us maintain two sorted arrays of indices one based on phone numbers and one based

on names. So the space used is less and search runs in O(log n).

#### **Here are some thoughts by moderators:**

Since the phone is of limited features, the number of contacts are also limited, typically 500 to 1000 contacts. And the contact length will be limited, assume it is 64 characters.

A phone contains atleast two types of memory, flash and RAM. Flash stores software and persistent data. RAM is used for processing.

There are various data structures to implement efficient searching. Quantitatively, as per our hypothetical feature phone of 1000 contacts, each of 64 characters long, we need [1000 \* 64 \* Nodesize] for the trie (an approximation). It is in the order of few kilo bytes. Where as we usually have RAM of few mega bytes.

If trie seems to be costly to the planned RAM, we can use ternary trie or compressed trie. Or even we can use radix based searching as someone pointed.

Since RAM is costly, we can allocate fixed size (say 1000) continuous blocks in flash memory to store these contacts. All we need is a dynamic search feature to access these contacts. Trie can be built in RAM whenever the user initiates search feature. Or even, since the data is constant, trie can be stored statically inside flash memory itself. During contacts update, bring that trie to RAM when search feature is called.

Note that a contact means set of data, not just phone number. It also include person name, contact number (one or more), group, assigned speed dial number, picture, etc... Be data centric while designing data structures. In the current case, search is simple feature wrapped over this data structure. Every end of successful search in our trie data structure will point to matched contact structure stored in the flash memory.

It is purely hypothetical thinking. Actual implementation will be even more complex based on required features. I hope it will be enough for interview discussion. Get sufficient details of question from the interviewer before jumping to answer. If you are on right track, the interviewer will help with some hints.

This article is compiled by Ravi Chandra. 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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Software Engineer

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## [TopTalent.in] Exclusive Interview with Ravi Kiran from BITS, Pilani who got placed in Google, Microsoft and Facebook



Even if we were to search around the world, it would be a truly difficult job to find someone like Ravi Kiran. As a Computer Science Graduate of BITS Pilani – Pilani Campus, he successfully bagged job offers from an astounding three companies – all being some of the best and most admired companies in the world – Google, Facebook and Microsoft. We, at [TopTalent.in](#), managed to talk to this amazingly humble genius, who hails from Hyderabad.

And before we forget, Ravi has also agreed to share his resume with our users so as to help them with their preparation. So don't forget to [grab a copy](#) by logging in. Here is the exclusive interview in its original form.

### **Team TopTalent.in: What were the similarities and differences between Google, Microsoft and Facebook Interviews?**

**Ravi:** All three of them share the prestige of being some of the best tech companies in the world. As you would expect, their interviews are designed to ensure the recruitment of top talent. An obvious similarity amongst their interview processes (for undergraduates, at least) is them being vastly algorithmic in nature.

There are multiple interview rounds in each recruitment process. For Microsoft there were 4 while Facebook conducted 3. For Google, I was a previous intern and, hence, faced just 2 rounds. Another noticeable thing was the presence of design questions in one of the rounds by both Microsoft & Google. However, by no means, can this be a generalization to the interview process of any of the companies. At the end of the day, this only reflects how each of them is aiming to assess a candidate's potential to the greatest amount in the shortest period of time.

### **Team TopTalent.in: How did you choose between Google, Facebook and Microsoft?**

**Ravi:** The more thought I put in the decision making process, the more confused I got. One of the major things I believed was that none of them was going to be a bad decision, so it was always safe to pick any one of them and not go wrong. Ultimately I chose Google, since I liked it as a company. I must confess that it was mostly a gut-feeling based decision.

### **Team TopTalent.in: What is the kind of skill-set that companies like these, are looking for in candidates?**

**Ravi:** Even though I'll keep one of the companies in mind, that is Google, to answer the questions further on, I can safely say that this answer of mine applies vastly to the three of them. The skill-set sought out is that a candidate must be creative, so as to come up with smarter and newer solutions to problems, which are algorithmically very strong and don't waste time solving already solved ones. The candidates are supposed to be, obviously, good at programming so that they can give shape to their ideas in the form of real code.

### **Team TopTalent.in: What should one keep in mind while creating a resume for these tech companies?**

**Ravi:** There are a lot of good references on "What makes a very good resume?" I had searched the same, and stuck to whatever made the most sense. I highly recommend a 1-page crisp resume, so that it's easier to make an impression when someone glances at it for about 3 seconds (I'm guessing that the time spent by a

higher-up person on a single resume is nearly that)

In addition, it's very important to make the resume highlight qualities and projects that provide enough reason to believe why you would make the perfect candidate for the job. Prior programming experience and other achievements would be useful to mention, to further your chances of making a good impression.

**Team TopTalent.in: Your advice to all the students out there who're aspiring for job offers similar to yours?**

**Ravi:** I think it's important to enjoy the field of work, and apply to only the companies that align with one's interests. In the long run, it would be hard to work in case the work doesn't go with your interests, even if the company is as nice as three mentioned above. I had never aimed to get into any of these companies, and it has only been a consequence of the activities that I was actively interested in (like competition programming, random problem/puzzle solving, etc) and thoroughly enjoyed.

**Team TopTalent.in: What's the difference between the work allotted in the Indian Office and the US Office?**

**Ravi:** I will speak about this question with respect to Google, since I have an experience in both the offices. The work isn't really any different across the offices. If you have a good project idea, you're always welcome to begin on it, and take it forward irrespective of which office you are from. I myself have had the chance to intern with a very good team back in Bangalore. Work in MTV is going really great too. That being said, the US office has more diverse project choices to offer, merely owing to its larger size.

**Team TopTalent.in: How can freshers/pass outs apply to these tech giants off campus? What's the process involved?**

**Ravi:** Applying off campus is usually a simple process in these days. Most of the companies have websites for application process, wherein one can just submit his/her resume, and expect to be shortlisted. It is important to highlight the efforts of other companies that are providing interview opportunities, through performance in online programming contests.

HR personnel of almost all companies are on a constant lookout for talented programmers, and students performing well in the online programming contests have great potential. A good chunk of people also get an interview call through the employee referral route.

**Team TopTalent.in: And lastly, what are you working on at Google and how has the experience been so far?**

**Ravi:** I work in the Search Infrastructure team at Google, and the journey has been great so far. Google's a fun place to work for, and they ensure to provide one of the best work conditions possible for an employee. It is very surprising how they provide so many amenities – for having fun and indulging in non-work related activities and interests – but at the same time manage to provide some really challenging work.

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## Microsoft Interview | 13

Microsoft has mainly 2 written test followed by 2/3 interview including HR round.

**1st Online Written Test:** This written test was easy, only C/C++ (easy questions) and some of OS and Microprocessor question were there, Total count was 20.

**2nd Online Test:** In Second round, there were two problem to code (they provide us editor, Pariksha Lite)

1. WAP to print last 10 lines of given string. If string has less than 10 lines then print whole string, lines are separated by '\n' . [Ans. There are two app. (i) Top to down (ii) Bottom to up ( this is efficient ) ]

2. A Binary Tree is given, print nodes value, level by level separated by '\n' [Ans. Level Order Traversal ]

**1st Face to face Interview**

My interview was good, following problem were asked me to do.

1. WAP to print the first unique character in a given string, make sure your program should run for all corner cases as well. {Ans. It is easy, use hashing with counting method, time and space complexity is O(n) and O(1)}

Then he told me how you will test your program followed by the test case.

2. You are given a square grid of nxn, you need to print the circle form by it in clockwise direction. for example

12

45

then output : 1254

123

456

789

then output: 2684

[Ans. It is easy to code using two successive loops. Have a look a similar question "Print element of matrix in Spiral Form", Refer Geeksforgeeks]

3. Some question on new technology and you interest.

**2nd face to face interview**

Some questions on my project like what you have done, why you choose this project, how you will enhance your project etc.

Then he asked me some puzzles and aptitude question.

1. You are given a jar in which there are 99 % black balls and 1% white balls, draw some black balls out from jar such that there left 98% black and 2% white. How many black balls you drawn?

[Ans. Let there are total N balls so, black(b) = 99N/100 and white(w) = N/100 after drawing 'x' balls the percentage of white get increase to 2% so N/100 = 2\*(N-x)/100

=>  $x = N/2$ , so draw half black balls].

2. At 10:30 what is the angle between hour and minute needle. [ you can do it ]

3. Puzzle: you have two eggs and 100 story building; find the top floor from which both of the eggs get break.

4. WAP to word by word reverse a given string. Ex. Given string is "Hey hi how ru ?". then print "? Ru how hi hey". Test your program for corner cases. Write test cases for your code and what happens if the given string is too long without separated by space that cannot be accommodate in given memory . [easy to answer]

5. Convert Singly and Doubly sorted linked list to BST and optimize it.

[Can be solved in  $O(n \log(n))$  and  $O(n)$ ]

### 3rd Face to face Interview (Final round)

This round was combination of HR round and technical round.

He started with some general questions like about me, what is your area of interest followed by what's your aim, why you want to join Microsoft etc. Then he asked me in which area you are passionate, I told him DS, Algo, C/C++ and OS. Then he asked me which operating system do you like / know about, after that, he asked me some question related to it. (around 5 question, and they were really tough one). He also asked me about Windows server edition (some deep questions). Then he gave following DS, Algo questions.

1. Wap to find paths from root to any leaf such that sum is equal to given sum.

{ans. It is easy to do, use logic of root to leaf path}. Rest I forgot..

This article is compiled by **Nitin Gupta**. Many Many congratulations to Nitin 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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## Microsoft Interview | 12

### Online Test:

MCQs: Mostly comprise the following types: find the output, definitions of basic C/C++ concepts.

### Coding questions:

1) Given a very large string, print the last ten lines.

2) Do a level order traversal of a binary tree.

### Interview Round 1:

1) Find the output:

```
void print()
{
    char str[20] = "hello world\0";
    int i=0;
    while (str[i]!='\0')
    {
        printf("%c", str[i]);
        i++;
        str[i] = str[i-1];
    }
}
```

There was a very detailed discussion on this question for nearly twenty minutes. I think I kind of screwed this one. Basically, I had to explain how and why does a segmentation fault occurs.

2) Suppose a linked list contains list of documents containing a particular word. You are given two such linked lists and you have to print names of all documents that contain both these words. [I gave an algorithm based on the assumption that the list contains document names in sorted order]. I was also asked to write the code regarding this. This operation can be classified as (A and B), where A and B are the words and they have lists associated with them. He then moved on to more complicated cases such as (A and B or C and (not D)). Brackets may or may not be presented. I was only asked to give an algorithm corresponding to this.

3) What are the steps that occur when you send an E-Mail. A detailed discussion was done regarding this wherein we also discussed about the layers of the OSI model, the protocol used for sending E-Mail, the layer to which it belongs to.

This article is compiled by **Vikram Goyal**. 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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## Microsoft Interview | Set 11

Company – STB team, Microsoft IDC.

Location – Hyderabad.

### **First interview**

1. A quick introduction.
2. Few questions on multi-threading like –
  - ...a. What is race condition?
  - ...b. What is critical section?
3. Write a code to find out longest substring without any repetition of characters with O(n) complexity.

Ex.

String – abcdefghxyzpbn  
Output string – bcdefghxyzp

4. Two linked lists are merged at one point. Find the merging node.

### **Second Interview**

1. A quick introduction
2. Few project related questions mentioned in resume.
3. If you have huge log file, you need to print last 'n' lines from the log file. Write a code for it assuming regular file read operations.  
He was also expecting that the page hit is minimum.  
I had provided a solution which would read the file one by one and then will store it in a 'n' size circular linked list.
4. If you have a  $m \times n$  floor, find out a 'k' size square tile which will take care of filling the complete floor without breaking of tile.  
Use GCD logic.

### **Third interview**

1. A quick introduction and he also asked what was asked in previous interviews.
2. We have a  $m \times n$  matrix, every element in row is in increasing order and every element in column is in increasing order. Find out a position of element 'k' from the matrix with  $O(m+n)$  complexity. Write a code for it.
3. We have a 'n' steps and a ball which take either 1 step at a time or 2 steps at a time. Find out the number of possible ways it covers exactly 'n' steps.

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## **Microsoft Interview | Set 10**

### **Written Test**

It was online test which contains 20 MCQs on C & C++.

The coding round had two questions.

- Given some text lines in one string, each line is separated by '\n' character. Print the last ten lines. If number of lines is less than 10 then print all lines.
- Do the level order traversal of complete binary tree. Given

```
1
2 3
4 5 6 7
```

Print it as

```
1
2 3
4 5 6 7
```

### **Technical Round 1**

- First he asked me to tell him about any project which I have worked on.
- Given an array of integers. Find consecutive elements in array which has maximum sum. I know the solution to this problem so I told him quickly.
- Next he modified the question and asked me to find consecutive elements in array that have sum equals to zero. Taking some time, I told the answer to this question also.
- Next he modified question again and asked me to find consecutive elements in array that have sum close to zero, given that there is no sub array with sum equals to zero. Also write test cases for it.

### **Technical Round 2**

- Given a linked list. How will I detect whether the list has cycle? Also write test cases for it.
- He then asked me whether I have some knowledge of graphics programming. He asked me how I will implement 'floodfill' for graphics application. Write code and test cases for it.

### **Technical Round 3**

- Given a 2D array and a key value. Search this key value in array and turn all elements in row and column of this key to zero.
- Given a sorted array of size n. Each element in array is unique and lies from 1 to n+1. Find the missing element. Write code and test cases for the same.
- How will I keep track of number of visitors visited my web page?

### **Technical/HR Round 4**

- Given a string. Find a character with most number of occurrences. Write code and test case for same.

- Why I want to join Microsoft?
- What's the most challenging task I did in my graduation life?

HIRED ☺ ☺

I would like to thanks geeksforgeeks team for this wonderful site which helped me a lot and without which I would not be able to crack this interview.

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This article is compiled by **Akash Gupta**. Many Many congratulations to Akash Gupta. 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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### Microsoft Interview | Set 9

I am Amit Dhaka. Following is my experience of MS IDC intern interview.

**Date of Written:** 9th September, 2012.

**Date of Interview:** 15 October, 2012.

**No. of Rounds:** 2 online exams + 4 rounds of PI

**Type of Interview:** Campus Interview.

**1st Online Test: Time 1/2 hour**

10 MCQs on basic Mathematical and Logical problems (mostly on P&C) and 5 MCQs on C programming.

**2nd Online Test: Time 1 hour**

3 programs were to be written.

1. Given a no. in form of base 4, you have to convert into base 2. The no. is given as a String. Do it in place.

2. Given a sorted circular linked list. You have to insert an element in it.

3. Two BST's are given. You have to print common nodes that are present in both of them.

**Interview Round 1:** Time 40-50 minutes.

1. Given a string, you have remove duplicates from it in O(n) time and O(1) space.

String can have ASCII characters. Try to use minimum extra space.

2. Given a binary tree, check if it is balanced or not.

**Interview Round 2:** Time 25-30 minutes.

1. Given two sorted arrays you have to merge them into single array.

2. Given an array, find all the pairs of elements whose sum is k.

3. Given an array, find a sub-array in which all pairs have their sum greater than k.

**Interview Round 3:** Time 30-40 minutes.

I was asked to tell something about myself. I spoke only a minute then he started asking problems.

1. Given an array, find the maximum contiguous sub-array with the maximum sum.

My query was can the array have negative values. He said yes.

2. Given two BST's, find the least common ancestor.

3. Traverse a binary tree in a Zig-Zag order.

**Interview Round 4:** Time 30-40 minutes.

First he asked me if I have any queries for him. I asked 3 questions as asking questions is a good gesture. You can ask that what kind of work will you be getting. Then he started with the problems.

1. Given a sorted array and it has been rotated unknown times. You have to find minimum element of the array. I did in O(log n).

2. He asked about the test cases for spell checker of MS Word.

Then he asked questions related to my resume. My advice will be that you don't write anything by which you can be doubted. Be confident about what you have done. If there is one thing you are good at then it is enough.

I was lucky, and got the intern!!

Many Many congratulations to **Amit Dhaka**. 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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### Microsoft Interview | Set 8

This about my experience of MS interview, which happened last day

Division: Microsoft Bing R&D

Rounds: Total 4 rounds (All face to face)

Location: Hyderabad.

**Tech Round 1**

1. Find the middle point of the linked list
2. Check whether loop exists or not in Linked List
3. How to calculate the size of the linked list
4. Given an unsorted array, how to divide them into two equal arrays whose difference of sum is minimum  
-> First I proposed sorting and then distributing them to two buckets. She's fine with that. However she doesn't want to sort the array and asked if i can solve in O(n) time

**Tech Round 2.**

1. Given an array, rotate the elements of an array within O(n) time and with O(1) space  
-> This is the worst round for me. Made silly mistake. I felt very bad after coming out. couldn't get an idea of continuous swapping

**Tech Round 3**

1. Given a sorted array, find the pair of elements whose sum can be equal or close to given sum
2. Given an array [a1b2c3d4] convert to [abcd1234] with O(1) space and O(n) time

**Director Round 4**

1. Given Linked list, write heapify and delete methods.
2. Given two sorted arrays of any length, find out the median of them if they are sorted into single array.  
-> Lost here. I couldn't find good solution. I think it's my bad luck If i could have crossed this question, I would have been in MS by now.

Anyways, it's a nice experience overall. First time I entered into MS campus and first interview with them. Learned lot. Needs to improve and get into that by next time

They will give little hints and try to use them and make solution out of it.

Thanks to **Nitin Gurram** for sharing Microsoft 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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## Microsoft Interview | Set 7

Recently I attended Microsoft Campus Interview and got selected. Below is my Interview Experience and I just wanna share it to GeeksforGeeks viewers.

**1st Round:**

Online Aptitude test:

Aptitude, logical questions and subjective Questions

**2nd Round:**

Online test

In this round we are asked to type the code in notepad and send (no compilers)

**3rd Round:**

It started with introduce yourself and he introduced himself to me. Then he asked me about my project and it gone to some stuffs related with memory. He asked me how a program is stored in memory

1) Write a program for beautification (proper indentation) of a program file in an IDE.

ex:

```
int main(){  
if(i>10)  
printf("Hi");  
else{}  
return 0;  
}
```

You are provided with getToken() which returns a token

ex: if(>10) is a token

int main() is a token

{,} are tokens

so output should be

```
int main()  
{  
if(i>10)  
printf("hi");  
else  
{  
}  
}  
else  
{  
}  
return 0;  
}
```

```
void beautify(char* inputfile,char* outputfile)
```

Give some testcases for the above program

2) Write a program to find the diameter of a binary tree and then he wanted to extend it for m-ary tree.

#### 4th Round:

1) You are provided with a string which contains single byte as well as two byte characters. If a character is single byte char, its MSB is 0, if its a 2 byte char, its MSB is 1. Write a program to check whether the given string is palindrome or not.

Test cases for above program.

2) Write a program to print the n-nodes from tail of the linked list.

Test cases for above program.

#### 5th Round:

1) Write a program to Validate an IPv4 Address.

Write test cases for above program.

2) Write a program to find all the possible paths from a starting point to dest point in a maze(2-D array).

```
ex: 1 0 1 0  
    1 1 1 1  
    0 1 0 1  
    0 0 1 1
```

If there is a block its represented by 0.

If there is a path its represented by 1.

#### 6th Round:(Final Round)

Write a code for printing last n lines in a file (refer man page of tail command in linux). The file size may vary, it may be 1MB or it may be 100 GB.

Give top 10 test cases for the above program

Many Many congratulations to **Muniraj G.** 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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## Microsoft Interview | Set 6

I am a guy from CSE dept, IIT-BHU and currently in 4th year. I am placed in microsoft now and all the credit goes to geeksforgeeks for sharpening and improving my coding skills. Thanks a lot guys for such a wonderful site. Below is my interview experience, if its of any help to my fellow job seekers.

#### Written Round 1 :

50 multiple choice questions in 60 mins time. Had 2 sections – Aptitude and Programming Ability.

#### Written Round 2 : 3 coding questions in 1 hour.

1. Swap every consecutive odd and even positioned bit in a number.

Ex:- 10101011010101 = 01010111101010

2. Given a binary search tree . Convert it into a doubly linked list in place (no extra space) such that prev points to left child and next points to right child.

3. Given a linked list that contains 0,1 and 2 . Sort this linked such that it contains 0s first, then 1s and then 2s in O(n) time. Ex:- 2->2->1->0->0->2->1->1->0 = 0->0->0->1->1->2->2->2

#### PI round 1 (Technical):

1. About urself, most challenging project of all you have done and about ur internship.

2. Remove from string s1, all the characters that are present in string s2.

S1="abcde" S2="xyazbx" Ans. S1= "cde"

3. Reverse alternate k nodes in an linked list.

Ex:- 1->2->3->4->5->6->7->8 if k=2; then return 2->1->3->4->6->5->7->8

4. Always ask some questions to the interviewer at the end. That's a good gesture.

5. Write test cases for the programs above and see if ur program covers all the test cases or not.

#### PI round 2 (Program manager)

1. Design a tic-tac-toe game for multiplayer on a smartphone.

2. Design a vending machine for blind and deaf.

#### PI round 3 (Technical)

1. Add numbers from 1 to n^2 into a n X n matrix spirally.

1	2	3	4	5
16	17	18	19	6
15	24	25	20	7
14	23	22	21	8
13	12	11	10	9

2. Remove duplicates from a string in place. Ex-microsoft -> microsoft  
 3. Some question on recursive functions using memoization technique for optimization.

#### PI round 4 (Testing)

1. Given a func :: int \*strcmp(char \*s1,char \*s2);

Write test cases to check functionality and security issues and even automate the generation of test cases.

2. Given a func :: int typeOfTriangle(int side1,int side2,int side3); (func gives a number for the type of triangle)  
 Write test cases to check functionality and security issues and even automate the generation of test cases.

3. WAP to reverse words in a sentence.

I am a good boy -> boy good a am i

4. WAP to get the next higher palindrome of a given number.

123 -> 131 1232 -> 1331

PS – Functional issues are test cases that check the functionality of the program and Security issues are the ones where the program may crash.

#### PI round 5 (Technical)

1. WAP to check if a binary tree is a BST or not.

2. WAP to find Least Common Ancestor of two nodes in a BST.

3. Reverse every two nodes in a linked iteratively and recursively.

PS- Whenever u write a program be sure to cover all the corner cases and write it in a proper indented way. As interviewers ask to write testcases for the program u have written and then check if ur program covers all the test cases.

All the best fellas !!!

Many Many congratulations to **Pritam Kumar Das**. 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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## Microsoft Interview | Set 5

Hi everyone, I would like to share my experience with MicroSoft, as i have been the lucky hire.

**Date:** 27th August 2012

**No. of Rounds:** 2 Written(online) + 4 rounds of PI( all Algo/Technical )

**Type of Interview:** Campus Interview for freshers

#### Written (online)

Objective(60 minutes) + Subjective(60 minutes)

Objective: Aptitude + Reasoning( 30 questions ) and technical( 20 questions, C/C++ programs, flow chart, identify correct function )

Subjective: 3 coding question( No in-build compiler in Web-Browser, simply you have to write your working code as a function/functions )

1) A number is given say n, find the minimum number which is greater than n and has same no. of set bits in it.

2) Binary search tree to Doubly linked list conversion( prefer in-place conversion )

3) Find the second maximum no. in an array

#### Personal Interviews (4 rounds)

##### Round 1: ( 40-50 mins )

1) Details about the project that i have listed in my resume, asked various question related to those projects.

2) details about q1 and q2 which is asked in the Subjective round, how you solve the problem and ask to write the same code I have written in Test and explain it.

3) question from OS:

....i) You have 10 GB of RAM, and you load multiples instances of a program of size 1 GB( let's say more than 10 instances), then what will happen, how the OS handle this situation and up to what extends?

....ii) producer – consumer problem

**Round 2: ( 20-30 mins )**

- 1) You have given a number N, print all balanced parenthesis expression which can be generate using N pairs of open and close braces. For ex. for N=3, ((())), ()(), .()()

First i gave him a brute force solution(generate all possible combination and check for valid expression),then he ask me for optimized code and I was able to do it after little mess-up.also ask for complexity of my code.

- 2) You have given a adjacency matrix of a graph, find the number of connected component set of the graph.

**Round 3: ( 35-45 mins )**

- 1) A string str and two character a and b are given to a function, find out the minimum distance between these two given characters in the str. first I gave him a bruce force solution( O( $n^2$ ) ) then he ask to optimize it ( O(n) ) and finally somehow i was able to do it.

- 2) You have n processes and m available resources, explain each step of OS in the execution of those process along with which data structure will be suitable at a condition, which scheduling algorithm will suit best, also in case of preemptive scheduling, waiting queue etc.. its take a long time to explain him. but finally he is satisfied with my answers.

- 3) Write a modified strcmp function which ignores cases and returns -1 if s1 < s2) iterative inorder traversal.

**Round 4: ( 40-45 mins )**

- 1) Give a schema for college student database management( tables, attributes and relationships ), ask me to normalize it up to 3NF.

- 2) Some queries based upon schema:

Find the maximum score of each student in his/her last semesters math subject.(it also be possible that some student got year back and not promoted, handle all the cases).

I tried it hard, gave him 2-3 wrong answers, but not able to do it(as i'm not very good in DBMS).. but he was satisfied with given schema.

- 3) He ask me about favorite programming language, and why I like that language..

- 4) You have given a range in Integer(a to b), find all the prime number between a and b.

.....i) first i gave him the simple solution(check every no. whether it is prime or not).

.....ii) then he asked about Sieve and to implement it, and which one is better(first approach or sieve)

- 5) what is most challenging moment in your B.Tech life. ?

- 6) Why do you want to join MicroSoft.?

- 7) Some question on my hobbies.

- 8) do you have any question for me.?

i asked 2-3 questions related to job profile(SDE/SDET) that they are offering,current projects and areas.

Finally...end of PIs and After 10-15 minutes, To my great relief, this time I was hired...

Many Many congratulations to **Ajeet Kumar**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview  
Interview Experience  
Microsoft

## Microsoft Interview | Set 3

I would like to thank GEEKSFORGEEKS team that they made my confidence level high when it comes to coding. I finished my interview today, hope this could be of help to others.

**Date Of Interview:** 25th Aug, 3rd Sept, and 4th Sept 2012

**No. of Rounds:** 2 online exams + 6 rounds of PI

**Type of Interview:** Campus Interview for fresher's

**25-08-2012:**

Online test conducted by some PARIKSHA LITE company (outsourced)

**TEST 1:** There were 15 questions to be done in 30 min. 6-7 of them were basic calculations and program output easy ones.

**TEST 2:**

A) There were 3 questions to be coded for IDC test:

- ....1) Check whether a linked list is a palindrome or not  
....2) Whether a given string is a new arrangement of main string (eg COXX is XXOC but not XOC)  
....3) Convert a given sorted dynamic linked list to balanced binary search tree.

B) There were 4 question in MSIT test:

- ....1) Write merging two arrays code or pseudo code.  
....2) Reverse a string of characters.  
....3) Print binary representation of a given number.  
....4) Given a control tower for aeroplane how will you make sure it does not fail. (Basically designing question )

**03-09-2012:**

**Round1:**

**Q1)** A thread waiting at while(1) and thread waiting at wait(wrt), what is the difference?

**Q2)** Output of following C program.

```
#include
#include
int main()
{
    unsigned int a, b, c;
    a = rand();
    b = rand();
    c = a + b;
    if( c
Q3) Write code to find Nth node from the last of a linked lists, and write test cases for the same.
```

**Round2:**

**Q1)** Write code to implement a command called 'tail -5 filename' in unix file using file pointers and also write test cases (HINT using fread and fseek command)

**Q2)** Write pseudo code to implement LRU in real time OS.

**Round3:**

**Q1)** Write code to convert given number into words (eg 1234 as input should output one thousand two hundred and thirty four)

**Q2)** Write test cases for the same question mentioned above.

**Round4:**

**Q1)** Write anagrams code when you are given an isWord() function in the fastest possible ways and also write test cases for that. After this the HR asked me to come on next day

04-09-2012

**Round5:**

**Q1)** Design a database schema for college elections and how will you make sure at database end that one user can vote for one person standing for one post only.

**Q2)** Write code to detect deadlocks and prevent deadlocks and implement as two separate functions.

**Q3)** Write Singleton pattern code and state places with usage of keyword static and virtual.

**Q4)** given two processes one that updates a database in 2 min and other in 5 min. Together they take 7 min. Design a method that can reduce this to minimum possible.

**Q5)** Write code to count number of nodes of a tree, find depth of a tree, find width of the tree.

**Round6:**

**Q1)** Design a class diagram for students registering for a sport and competition being held based on which you can decide which guy wins or loses.

Rest were sort of HR questions like why microsoft, your strengths etc but in the end she said we will send your feedback to the campus placement cell, Thank you.

This article is compiled by Ankush Choudhary. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforge



## Microsoft Interview | Set 2

Please find the details of my Microsoft Interview below.

**Date Of Interview:** 3rd August,2012

**No. of Rounds:** 2 online exams + 4 rounds of PI

**Type of Interview:** Campus Interview for freshers

**1st Online Test:** Time 1 hour

30 MCQs on basic Mathematical and Logical problems and 20 MCQs on C programming.

**2nd Online Test:** Time 1 hour

3 programs were to be written. They wanted full length program, not just the functions. Language: C/C++

1. Given the head pointer of a linked list, each node having data value only 0/1/2, properly sort the linked list and return the head pointer.
2. Given a picture with pixels arranged in an N\*N matrix, right rotate the picture by 90 degree.
3. Two of the nodes of a BST are swapped. Correct the BST.

**Interview Round 1:** Time 30-40 minutes.

1. Given a Binary tree, where each node has also its parent pointer pointing to its parent, apart from two usual child pointers. Write the function for inorder successor. Discuss all possible test cases for this function and whether your function can handle all those test cases.

2. How can you check whether a binary tree is BST or not, in the most space optimised manner.

**Interview Round 2:** Time 30-40 minutes.

1. Given two sorted linked list, create a third list which contains only those elements of first list, which are not common with second list. Do this with O(n) time. Discuss all possible test cases for this function and whether your function can handle all those test cases.

**Interview Round 3:** Time 30-40 minutes.

1. If your friend writes a text editor software and gives it to you for testing, what are the tests you will perform on the software to ensure it meets the basic requirements of a naive user?

2. Given two linked lists, how do you check whether the two lists intersect at some node with O(n) time? Discuss all possible test cases for this function and whether your function can handle all those test cases.

**Interview Round 4:** Time 30-40 minutes.

1. Given an array of unsorted integers, find all the pairs of numbers which sum to a given N. Discuss all possible test cases for this function and whether your function can handle all those test cases.

2. Given three points a, b and c, write a function to find what type of triangle they construct or whether a triangle can be made at all. Discuss all possible test cases for this function and whether your function can handle all those test cases.

**HIRE!!**

This article is compiled by **Shreyasee Nandy**. Many Many congratulations to Shreyasee.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview  
Interview Experience  
Microsoft  
Microsoft Interview

## Microsoft Interview | Set 1

Following are the details of my Microsoft interviews.

**Date of Interviews:** 30th July, 31st July and 3rd August, 2012

**No of Rounds:** 1 aptitude test, 1 coding round and 4 PIs

**Type of Interviews:** Campus Interview for freshers

**Aptitude Test(60 mins) (30-7-12)**

It was an online test. It consisted of 50 questions, of which 30 were aptitude based and 20 were technical.  
30 aptitude based questions consisted of speed-time based, probability, etc.

20 technical question included C outputs, flowchart, finding correct code for prime no, Fibonacci no, etc.

#### Coding Round(60 mins)(31-7-12)

Three questions were there

**Question 1:** You have to rotate an  $n \times n$  array right by 90 degree.

**Question 2:** Given a linked list containing 0s, 1s or 2s. Sort it.

**Question 3:** Two elements of BST are swapped by mistake. You have to restore the tree without changing its structure.

Note that you don't have to write a function only, as happens in Amazon. Instead you are expected to write it from scratch along with main function and all the helping functions.

My advice: Screw the instruction, write the function you are expected to write for all the three questions, then go for helping functions and main function.

#### Personal Interview(3-8-12)

##### Round 1(40 mins):

A binary tree is given. You have to check whether left node data is greater than right node data for all nodes.

My Query: What if either one of the left or right subtree is not present.

Clarification: You can then assume max possible value for left data, if absent and min value for right node data.

I was asked to dry run my code for a tree. Also test cases were asked to check my code.

##### Round 2(80 mins):

**Question 1:** To find Inorder successor of a node in a binary tree, provided you have parent pointer.

**Question 2:** To find Inorder successor of a node in a binary tree, provided you do not have parent pointer. Test cases for both of them were asked.

**Question 3:** Given a linked list a random ptr also exists. Clone the original linked list. Also give the test cases.

**Question 4:** Construct a data structure which can push, pop and find minimum in  $O(1)$  time. Was asked to code it. Test cases were also asked and was asked to ensure that it works for duplicate elements also.

##### Round 3(80 mins):

**Question 1:** A file consists of numerous words in it. You have to print the 10 most frequent words. Data structures to be used were asked and was asked to finally code it.

**Question 2:** Test cases were asked for a railway portal.

**Question 3:** A function was there which accepts a number  $k$  and a linked list and deletes every  $k$ th node of that list. A function to test the correctness of the above function was expected to be coded.

**Question 4:** An extension of Question 3. What if function accepted an array of numbers instead of just one number and deleted multiples of array elements.

##### Round 4(40 mins):

This round was easiest of all.

**Question 1:** Write a modified strcmp function which ignores cases and returns -1 if  $s1 < s2$ , 0 if  $s1 = s2$ , else returns 1. Test cases were asked, as usual.

**Question 2:** Write a function which checks whether the tree is height balanced or not. Give test cases also.

To my great relief, this time I was hired.....finally..... ☺

This article is compiled by **Vinay Khetan**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Microsoft

## Sum of bit differences among all pairs

Given an integer array of  $n$  integers, find sum of bit differences in all pairs that can be formed from array elements. Bit difference of a pair  $(x, y)$  is count of different bits at same positions in binary representations of  $x$  and  $y$ .

For example, bit difference for 2 and 7 is 2. Binary representation of 2 is 010 and 7 is 111 ( first and last bits differ in two numbers).

Examples:

**Input:** arr[] = {1, 2}

**Output:** 4

All pairs in array are (1, 1), (1, 2)

(2, 1), (2, 2)

**Sum** of bit differences = 0 + 2 +

2 + 0

= 4

**Input:** arr[] = {1, 3, 5}

**Output:** 8

All pairs in array are (1, 1), (1, 3), (1, 5)

(3, 1), (3, 3) (3, 5),

(5, 1), (5, 3), (5, 5)

**Sum** of bit differences = 0 + 1 + 1 +

1 + 0 + 2 +

1 + 2 + 0

= 8

Source: Google Interview Question

We strongly recommend that you click here and practice it, before moving on to the solution.

A **Simple Solution** is to run two loops to consider all pairs one by one. For every pair, count bit differences. Finally return sum of counts. Time complexity of this solution is  $O(n^2)$ .

An **Efficient Solution** can solve this problem in  $O(n)$  time using the fact that all numbers are represented using 32 bits (or some fixed number of bits). The idea is to count differences at individual bit positions. We traverse from 0 to 31 and count numbers with  $i$ 'th bit set. Let this count be 'count'. There would be "n-count" numbers with  $i$ 'th bit not set. So count of differences at  $i$ 'th bit would be "count \* (n-count) \* 2".

Below is C++ implementation of above idea.

```
// C++ program to compute sum of pairwise bit differences
#include <bits/stdc++.h>
using namespace std;

int sumBitDifferences(int arr[], int n)
{
    int ans = 0; // Initialize result

    // traverse over all bits
    for (int i = 0; i < 32; i++)
    {
        // count number of elements with i'th bit set
        int count = 0;
        for (int j = 0; j < n; j++)
            if ((arr[j] & (1 << i)))
                count++;

        // Add "count * (n - count) * 2" to the answer
        ans += (count * (n - count) * 2);
    }

    return ans;
}

// Driver program
int main()
{
    int arr[] = {1, 3, 5};
    int n = sizeof arr / sizeof arr[0];
    cout << sumBitDifferences(arr, n) << endl;
    return 0;
}
```

Output:

8

Thanks to Gaurav Ahirwar for suggesting this solution.

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

## GATE CS Corner Company Wise Coding Practice

Bit Magic  
Google

## Minimum number of swaps required for arranging pairs adjacent to each other

There are  $n$ -pairs and therefore  $2n$  people. everyone has one unique number ranging from 1 to  $2n$ . All these  $2n$  persons are arranged in random fashion in an Array of size  $2n$ . We are also given who is partner of whom. Find the minimum number of swaps required to arrange these pairs such that all pairs become adjacent to each other.

Example:

**Input:**  
`n = 3  
pairs[] = {1->3, 2->6, 4->5} // 1 is partner of 3 and so on  
arr[] = [3, 5, 6, 4, 1, 2]`

**Output:** 2  
**We can get** {3, 1, 5, 4, 6, 2} **by swapping** 5 & 6, **and** 6 & 1

Source: Google Interview Question

We strongly recommend you to minimize your browser and try this yourself first.

The idea is to start from first and second elements and recur for remaining elements. Below are detailed steps/

- 1) If first and second elements are pair, then simply recur for remaining  $n-1$  pairs and return the value returned by recursive call.
- 2) If first and second are NOT pair, then there are two ways to arrange. So try both of them return the minimum of two.
  - a) Swap second with pair of first and recur for  $n-1$  elements.

- Let the value returned by recursive call be 'a'.
- Revert** the changes made by previous step.
  - Swap** first pair of second **and** recur **for n-1** elements.  
Let the value returned by recursive call be 'b'.
  - Revert** the changes made by previous step before returning control to parent call.
  - Return**  $1 + \min(a, b)$

Below is C++ implementation of above algorithm.

```
// C++ program to find minimum number of swaps required so that
// all pairs become adjacent.
#include<bits/stdc++.h>
using namespace std;

// This function updates indexes of elements 'a' and 'b'
void updateIndex(int index[], int a, int ai, int b, int bi)
{
    index[a] = ai;
    index[b] = bi;
}

// This function returns minimum number of swaps required to arrange
// all elements of arr[i..n] become aranged
int minSwapsUtil(int arr[], int pairs[], int index[], int i, int n)
{
    // If all pairs procesed so no swapping needed return 0
    if (i > n) return 0;

    // If current pair is valid so DO NOT DISTURB this pair
    // and move ahead.
    if (pairs[arr[i]] == arr[i+1])
        return minSwapsUtil(arr, pairs, index, i+2, n);

    // If we reach here, then arr[i] and arr[i+1] don't form a pair

    // Swap pair of arr[i] with arr[i+1] and recursively compute
    // minimum swap required if this move is made.
    int one = arr[i+1];
    int indextwo = i+1;
    int indexone = index[pairs[arr[i]]];
    int two = arr[index[pairs[arr[i]]]];
    swap(arr[i+1], arr[indexone]);
    updateIndex(index, one, indexone, two, indextwo);
    int a = minSwapsUtil(arr, pairs, index, i+2, n);

    // Backtrack to previous configuration. Also restore the
    // previous indices, of one and two
    swap(arr[i+1], arr[indexone]);
    updateIndex(index, one, indextwo, two, indexone);
    one = arr[i], indexone = index[pairs[arr[i+1]]];

    // Now swap arr[i] with pair of arr[i+1] and recursively
    // compute minimum swaps required for the subproblem
    // after this move
    two = arr[index[pairs[arr[i+1]]]], indextwo = i;
    swap(arr[i], arr[indexone]);
    updateIndex(index, one, indexone, two, indextwo);
    int b = minSwapsUtil(arr, pairs, index, i+2, n);

    // Backtrack to previous configuration. Also restore
    // the previous indices, of one and two
    swap(arr[i], arr[indexone]);
    updateIndex(index, one, indextwo, two, indexone);

    // Return minimum of two cases
    return 1 + min(a, b);
}

// Returns minimum swaps required
int minSwaps(int n, int pairs[], int arr[])
{
    int index[2*n + 1]; // To store indices of array elements

    // Store index of each element in array index
    for (int i = 1; i <= 2*n; i++)
        index[arr[i]] = i;

    // Call the recursive function
    return minSwapsUtil(arr, pairs, index, 1, 2*n);
}

// Driver program
int main()
{
    // For simplicity, it is assumed that arr[0] is
    // not used. The elements from index 1 to n are
    // only valid elements
}
```

```

int arr[] = {0, 3, 5, 6, 4, 1, 2};

// if (a, b) is pair then we have assigned elements
// in array such that pairs[a] = b and pairs[b] = a
int pairs[] = {0, 3, 6, 1, 5, 4, 2};
int m = sizeof(arr)/sizeof(arr[0]);

int n = m/2; // Number of pairs n is half of total elements

// If there are n elements in array, then
// there are n pairs
cout << "Min swaps required is " << minSwaps(n, pairs, arr);
return 0;
}

```

Output:

**Min swaps required is 2**

Thanks to Gaurav Ahirwar for above solution.

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

## GATE CS Corner Company Wise Coding Practice

Arrays  
Google

## Google Interview Experience | Set 5 (for Java Position)

The solution will be evaluated on following parameters.

Object Oriented Design aspects of the solution.

Overall coding practices.

Working test cases of the solution.

You can use Ant/Maven as build tools for the solution, Junit, Mockito or other testing frameworks.

You may also include a brief explanation of your design and assumptions along with your code.

**Problem Statement:** In a Formula-1 challenge, there are n teams numbered 1 to n. Each team has a car and a driver. Car's specification are as follows:

- Top speed:  $(150 + 10 * i)$  km per hour
- Acceleration:  $(2 * i)$  meter per second square.
- Handling factor (hf) = 0.8
- Nitro : Increases the speed to double or top speed, whichever is less. Can be used only once.

Here i is the team number.

The cars line up for the race. The start line for  $(i + 1)$ th car is  $200 * i$  meters behind the ith car.

All of them start at the same time and try to attain their top speed. A re-assessment of the positions is done every 2 seconds (So even if the car has crossed the finish line in between, you'll get to know after 2 seconds). During this assessment, each driver checks if there is any car within 10 meters of his car, his speed reduces to:  $hf * (speed at that moment)$ . Also, if the driver notices that he is the last one on the race, he uses 'nitro'.

Taking the number of teams and length of track as the input, Calculate the final speeds and the corresponding completion times.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google

## [TopTalent.in] Interview With Divanshu Who Got Into Google, Mountain View



Even if we were to search around the world, it would be a truly difficult job to find someone like Divanshu. As a Computer Science Graduate of IIIT Allahabad, he successfully bagged job offers from an astounding three companies – all being some of the best and most admired companies – Google, DE Shaw and CodeNation. We at TopTalent.in spoke to Divanshu from IIIT Allahabad about the Google Interview Process, how he managed to crack it and what are his suggestions for aspirants looking to achieve something similar.

You can [download](#) his resume by logging in to your account on TopTalent.in.

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

I feel elated and happy on cracking the Google, Mountain View offer. It is a dream come true to work for one of the most prestigious IT organization. I am really looking forward to be a part of the organization next year. It was possible only due to constant support of my parents and my elder brother who were more than happy to know that I have achieved this wonderful feat.

**TopTalent:** What other offers did you get apart from Google?

I had interned at D. E. Shaw during the summer of 2014 and got a PPO afterwards. I also got an offer from CodeNation which is a startup under the Trilogy group.

**TopTalent:** Can you brief us the interview process?

I participated in the Google APAC Code Jam. I stood first in India and seventh globally by solving three out of four problems. All the problems in this round required good knowledge of Algorithms. Based on the performance, Google called me for onsite interviews at their Bangalore office. There were a total of four interviews and involved questions from Programming, Algorithms, Data Structures and Operating System.

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

According to me, all the four interviews had a similar difficulty level. During all the interviews, the difficulty bar was raised slowly as we approached the end of the interview. The interviewers presented a tougher question than what you have already answered.

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

I was preparing for the ACM ICPC contest which played a very big role in improving my knowledge of algorithms, data structures and mathematical reasoning. It helped me to code my logic faster and accurately. Apart from that, I revised my Operating System and Database Management System courses. I also went through my past projects to gain an insight into each one of them.

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

My major skill is Programming and Algorithms. I have a good rank on Topcoder and other websites which was an advantage. Along with that, I have explored many different fields which helped me a lot. I have good knowledge of web development and mobile application development. I have also worked on projects involving Machine Learning, Information Retrieval and Image Processing.

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

For algorithms, I practiced on Topcoder, Codeforces and Codechef participating actively in their regular contests. Introduction to Algorithms by CLRS is a nice book on algorithms. You can also learn from Topcoder Tutorials and various online blogs written by active programmers. For Operating System and DBMS, the course books are enough if you read them thoroughly.

**TopTalent:** Were grades a factor in you getting selected?

I was required to send all my grade cards after one week of the interview process. Then they reviewed everything and the offer was given. So, I believe that grades were also a factor involved in the selection process.

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

Everyone has interests in different domains. One must ensure that they learn more and more about their area of interests. One should be very comfortable in expressing a thought process in any programming language of their choice since most of the companies look for your accurate implementation of the given problem. Also, Codeforces and Topcoder are nice websites to regularly practice your algorithmic skills and improve your problem solving as well. Students should also keep a focus on developing good projects to explore a variety of technologies.

In case you missed, you can also [download](#) his resume by logging in to your account on TopTalent.in

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google  
Toptalent

## Google Interview Experience | Set 4

Though I didn't clear google but I want to share my Google interview experience , so it can help other's . Please find my interview experience below:

My **Google Interview Experience for Software Developer Position [Android Core Team], London, United Kingdom**

Like many other enthusiastic engineers, I too applied for a job at Google. I know that its very difficult that a resume gets noticed by google.

Suddenly, one fine day I received a Mail( "Hello from Google !") from Google's HR saying that they are interested in my profile and asked me if I was ready to go ahead with the interview process[Come on! you cant say no to Google].

**Round1(Phone interview) :**

**By:Talent Scout @Google:**

**\* Questions from Project :**

**Spell Corrector:**

How it works , Bigram and ngram model approach, etc.

\* Why should one use merge sort over quick sort and vice-versa.

\* You have a very large array of 'Person' objects .Sort the people in increasing order of age .

**General :**

Then came the exciting part when he asked me to choose location b/w **Google Paris**(Text-Speech Team) or **Google London**(Android Core Team).

He explained how Google work's on their projects !

About Google interview process ( 2-3 phone interview + 4-5 onsite interview in London ).

#### Round2:(Phone interview + coding on shared google doc)

By:Software Developer @Google :

\* Questions from Project:

Bi-directional Sync b/w mysql and sqlite db.

\* Given a number , check if it can be represented in  $5^n$  form , where n is positive integer .

\* Given a string of words with lots of spaces between the words , remove all the unnecessary spaces like

```
input: I live on earth  
output: I live on earth
```

#### Round3:(Phone interview + coding on shared google doc)

By:Software developer @Google :

\* Optimize  $a^b$

\* How would you split a search query across multiple machines?

\* You need to develop the game Snake. What data structures will you use? Code your solution.

#### Some additional hints for the interview:

Clarify the question – make sure you understand everything.

Try to find the most efficient solution.

Come up with solutions quickly: even if its a brute force solution. Always iterate away from the original solution.

Before you start coding explain why you're approaching it that way ,its ok to start off with a naive solution and try to make it more efficient.

Explain the rationale behind the steps you are doing.

Think out loud, keep things technical. The engineers will give you hints: take a hint! They are there to help you!

Always write "compilable" code.

Mind edge cases. Find bugs in your code.

**Note:** You can know more about me at [www.codedoctor.in](http://www.codedoctor.in)

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google

### [TopTalent.in] “It’s the best feeling of my life” says Krunal after cracking Google, Mountain View



“I will never forget the day I received my offer letter. Its a dream come true.” Landing a job in Arista Networks would ideally be a dream opportunity for many but for Krunal Patel from BITS Pilani – Goa it was just the beginning. We at TopTalent.in spoke to Krunal about the Google Interview Process, how he managed to crack it and what are his suggestions for aspirants looking to achieve something similar.

You can also [download](#) his resume by logging in to your account.

#### TopTalent: Can you tell us about the interview process?

Google conducted APAC test for 2015 graduating students in Asia pacific regions. I was 8th overall and 2nd in India after Divanshu. I was called for interviews at Google Bangalore office after that. I had 4 interviews in total and all of them were based on data structures and algorithms. A few basic questions were also asked from OS.

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

According to me all the interviews were of similar difficulty level. They were testing different domains in Algorithms and Data structures. The last interview was relatively

at a bit higher difficulty level.

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

I revised all my computer science CDCs before the placement season started. Lecture slides were good enough for that. I prepared for the GATE exam in the beginning of the year and it saved a lot of time for me during placement season. In my last 4 years my goal was to learn as many new technologies as possible. I gained introductory knowledge in web designing, Machine learning, Network Science, Application development etc. Apart from that I regularly practiced on codechef and topcoder to improve my programming and problem solving skills. I also thoroughly revised my projects which were mentioned in my resume before the interviews.

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

Mainly programming skills. I like participating in various programming contest and it improved my knowledge in algorithms as well as my programming skills. For eg. I learned to spend more time in designing the solution than in coding. Special thanks to my friend N Hari Prasad (Google Hyd) who guided me all the time.

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

For my computer science subjects I mainly used my textbooks and lecture slides. For Algorithms I used Cormen and various tutorials on internet.

#### **TopTalent: How was Competitive Programming in the interview?**

By participating in such competitions and practicing in topcoder, I improved in terms of speed , Accuracy , Efficiency , and problem solving approaches. All of them plays crucial role in interviews where we are asked to design and code the solution for an unseen problem

#### **TopTalent: Were grades a factor in you getting selected?**

Google asked for my grade sheet after all the interviews were over. Hence it was part of their review process. Good grades always make a better impression.

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

1) Writing code after you solve a question or learn a new data structure or algorithm is equally important. Make a habit to write neat and readable code as that helps your entire team. Make sure you get your code reviewed. In case of programming puzzles, see the setter's solution.

2) Attend your classes regularly.

3) Find your passion and never give up on it. Rest all follows.

4) Keep yourself updated with new technologies.

In case you missed, you can also [download](#) his resume by logging in to your account.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Google

## [TopTalent.in] Top College: No, Top Talent: Yes ; Anudeep cracks Google



Anudeep Nekkanti embodies the old adage – there is no substitute for talent. The 21-year-old coder from Samalkot (a small town near Vishakapatnam) has landed an offer from Google, Zurich.

What makes Anudeep's feat commendable is that he was not placed out of the cream colleges of the country. No he is not an IITian, NITian or BITSian! A B.Tech student in computer science from Anil Neerukonda Institute of Technological Science, Vishakapatnam, he considers his preparation and performance in programming competitions the reason for his success at cracking the google interview process.

We at toptalent.in had the opportunity to interact and pick Anudeep's brain to gain valuable insights into developing the right skills to be successful at getting recruited at Google.

#### **Toptalent: How do you feel on achieving this rare feat?**

**Anudeep:** It always feels great to achieve something rare. I was happy after knowing about it, but the real joy was after knowing how much my parents and well-wishers enjoyed the news. There is a lot of hype about being Googler, excited to see what it is really. Also excited about Zurich and Swiss chocolates

#### **Toptalent: What made you chose your particular college and course?**

**Anudeep:** I did not know about IIT-JEE or AIEEE. I did not dream about joining particular college. I almost never took decisions back then. My dad is cool, he does not believe that education is everything and he did not want me to only concentrate on studies. So, when joining 11<sup>th</sup> standard, he asked me if I want to opt for JEE training. Not knowing what it is, my initial answer was yes but then he realised that I had no knowledge of what I was getting into and made me change my mind, and I am grateful to him for that.

My EAMCET (State board common entrance test) rank was in the seven thousands. I had never lived outside of my town. So I wanted to stay away in a city and study, at the same time I did not want it to be too far from my home. Visakhapatnam was the best choice.

Initially I was supposed to take Electronics. My sister, who had finished B.Tech in computer science by then told me "CS is easy, you can start preparation one day before exams and clear them". Well, I was looking to enjoy a lot in engineering and this line was perfect! It had so much impact. I just decided to take Computer science. It turned out to be one of the best decisions I have taken. CS is not easy, it is fun!

**TopTalent:** How many interviews were held in all?

**Anudeep:** Telephonic Interview initially. Then six onsite interviews at Google Hyderabad, then manager interviews.

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

**Anudeep:** Hard to pick a single interview. Of the eight rounds I had with Google, couple of them were tough, one of those rounds lasted two hours on a single question.

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

**Anudeep:** I did not prepare on anything specific for Google interview, I knew that my strength is algorithms and data structures. I did not want to read about other topics only for the purpose of job. I was hoping that only algo related stuff was asked. I was lucky with Google, all my interviews, all the questions were related to algorithms, data structures and programming.

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

**Anudeep:** It is competitive programming. I should say I was lucky about it. It is true that majority of hiring is biased towards competitive programming. One can clear these interviews by having good knowledge only about algorithms and data structures. Open source contributions, projects and machine learning are 3 other skills I would list.

**Toptalent:** Tell us a bit about competitive programming and how you became good at it.

**Anudeep:** It is similar to any other sport. One need to have a lot of interest to perform. One need to put a lot of effort to top. We say someone is 'out of form' or 'in form' in sports, true for competitive programming too, you need to keep doing them to be in good touch. And most importantly, at some point of time you realize that 'This sport is not correct for me', it can be true with programming too, and when this happens do not hang on to it, move on there are lot more things to do. How did I become good at it? I played it a lot. Concentrated practice is all that matters.

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

**Anudeep:** Firstly, I solved about 300 problems on SPOJ (Sphere Online Judge). I came to know about online judge for the first time in 2012 Jan. That was because of IOPC (programming contest by IIT Kanpur).

Practice was my mantra. I used to try a problem for 2-3 hours. If I didn't get it, I looked for solutions on forums. I read few tutorials on TopCoder, but I did not know that TopCoder also has algorithm problems. I participated in following August's long contest, I was lot better this time, I could solve 7 problems. Ended 35th in Global ranking.

With this limited exposure to programming I went to participate in ACM ICPC Regionals. I could solve 4 problems there at onsite. I then understood that knowing how to solve is not enough, it is the ability to think and code fast is more important.

By August end I solved about a hundred and eighty *500 pointers*. I slowly started to think dynamically. By then I was able to solve four out of five problems. Now I am quite comfortable with 500 pointers. So, to conclude all that matters is sheer practice.

Programming is fun, programming is easy. My failure at IOPC 2012 made me start it. I thought, I will do well in IOPC 2013 and stop programming. That is how I started it. Very soon I started to like it, then I got addicted to it. I enjoy the feel that I get when I see "Accepted". That awesome green color. My heart beat raises whenever I submit a solution. I get goosebumps. It was that fun that kept me going. Don't do it, Play it. Enjoy it, it is a fun game. After 21 months, I am still deeply in love with it. Right now I am preparing for world finals. I am doing problems from various on-line judges like Topcoder, Codechef, Codeforces.

**Toptalent:** Were grades a factor in you getting selected?

**Anudeep:** No. I did not mention much about my grades in my CV. My CV only says B.Tech 4th year, 8 CGPA till date.

**Toptalent:** Tell us more about your final location choice, Zurich?

**Anudeep:** I had to risk my job for Zurich. I was initially offered London, Bangalore and then Hyderabad. I told I do not want to take those position, and was in a situation of being completely rejected by Google. But I was okay with that too so I told no to those 3 positions. 70 days after my onsite interview I was finally given Zurich.

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

**Anudeep:** I see that a lot of Indians are putting a lot of effort into competitive programming (mainly for placement offers) with not so good results. Trust me, do it with complete concentration for a month, by then you will exactly know if you have to continue in this field or not. If you feel you should not continue, stop it, do not hang on to it hoping for offers. Use your time on other stuff.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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## Google Interview Experience | Set 3 (Mountain View)

About myself : I was contacted on Linkedin by a google recruiter. I have 4 years of experience.

### Phone screen

Warm ups

- 1) Manually calculate bits in 146
- 2) Tell difference between big endian and little endian

### Actual questions

- 1) kth largest element in array
- 2) Find minimum number of steps to reach the end of array from start (array value shows how much you can move). DP question

Next day recruiter called me for onsite interview.

I scheduled my onsite interview after 30 days to give myself sufficient time to prepare.

#### Onsite interview

##### Round 1

- 1) Design question based on storing images. Stress on performance and scale.
- 2) Divide number and return result in form of a string. e.g 100/3 result should be 33.(3) Here 3 is in brackets because it gets repeated continuously and 5/10 should be 0.5.

##### Round 2

- 1) Median of stream of numbers
- 2) Question like pancake sorting where you can only swap to sort an array of characters.

##### Round 3

- 1) Find count of a number in sorted array.
- 2) Design two player battleship game to be played over internet

##### Round 4

- 1) Design question based on wearable devices.
- 2) Draw a line on 2D array of boolean. You will be given start point and end point co-ordinates.

##### Round 5

- 1) Compare two documents(string array) based on n grams.

e.g doc1 – Today is Sunday.

doc2 – Today is Saturday

if n = 2 then number of duplicates is 1 (Today is)

if n = 1 then number of duplicates is (Today, is)

if n = 3 duplicates is 0

Final comments – You must do graphs, DP, string, array, bits and Link list questions from geeksforgeeks.

Design questions are much harder to answer than it seems. Prepare hard for them.

I appeal geeksforgeeks team to post more questions on design.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google  
Interview Experience

## [TopTalent.in] What it takes to be a Googler? An Interview with Google's recent hire Romal Thoppilan



There is a myth that only grads with high CGPA land in high paying dream companies. Despite his average grades, Romal with his extraordinary coding talent and determination succeeded in getting a job offer from Google. "I would like to create something disruptive in the fields of Data Science and Mining, and I believe Google is the right place to start my career," says the myth buster. We at TopTalent.in got a chance to interact with him about what made this possible and what others can learn from this.

In case you are wondering how the resume of a Google recruit looks like, you can [download](#) the resume by logging in.

**TopTalent : Could you briefly describe your student days at BITS Pilani ?**

**Romal :** I always considered myself fortunate to be pursuing my degree at BITS Pilani. The curriculum here is quite flexible giving enough scope to nurture your interests apart from academics. I tried to make the most of it by being able to complete few higher degree courses in undergrad itself. The faculty here is pretty knowledgeable, I spent some great time working along with them in projects. Also the students here share great enthusiasm towards their career and play a big role in your development.

**TopTalent : What makes Google special?**

**Romal :** Google certainly ranks among the top companies to work at and the quality of the products and services they offer is well known. Also working in Google allows one to pursue his own interest along, since Google has such wide ranges of projects to offer. The work environment and the culture there adds every bit of fun to it.

**TopTalent : How much preparation did you put in to bag this opportunity?**

**Romal :** Unlike most others, I took my time off. My primary objective was to complete and furnish off some of my incomplete projects, so that I could be confident about them during placements. For programming, I used to practice codeforces problems. The contests it organizes contains a real good mix of mathematical, logical and algorithmic problems, and poses an environment much similar to coding rounds during placements. Besides, I had completed most of the algorithms from Cormen and then shifted to GeekForGeeks to refer to past years interview experiences.

**TopTalent : Can you describe the complete hiring process of Google?**

**Romal :** The whole hiring process was pretty smooth actually. It had one written round based on your overall knowledge of the field which basically had a few aptitude and coding questions. The shortlist was announced after two weeks and we were called for an on-site interview at its Bangalore office. Then followed four back-to-back interviews, mostly algorithmic. We were allowed to write the code through whichever medium we were comfortable with. I toggled through all – pen, board and online editor. There was very little delay and the accommodation and food were pretty good. Finally within a week, I got the CALL!

**TopTalent : What topics do you think students should prepare for similar jobs like that of yours?**

**Romal :** Firstly, they should have regular coding practice as most companies now prefer using coding rounds for shortlisting. The problems asked normally don't require any deep knowledge of algorithms. They are to test your speed and logical thinking. Then comes personal interviews. Most of the companies prefer asking algorithmic problems. However, these questions could indirectly test your basics around other topics like operating systems and database management system as well. Mostly if your basics are clear, they look at the way you think and reach the solution.

**TopTalent : From your experience, what are some of the important factors that the interviewers will be looking out for?**

**Romal :** Many believe that interview questions keep on repeating every year so they could just mug up everything to clear such interviews. This brute force way doesn't even work out for regular jobs let alone Dream Companies. In one of my interviews, the interviewer asked me a question which I had never seen before. When I finished reading the problem, he asked me to speak out everything that came to my mind and to not stop speaking till I reach some solution. Luckily for me, I did arrive at some solution. It was a mind boggling experience. These kind of interviews end up testing your thinking abilities more than anything. For Jobs like the one I am going to join, strong basics in algorithms and critical reasoning skills are essential. These are the two most important qualities that interviewers will be looking in you. *The answer impresses nobody, the way you reach there is what matters.*

**TopTalent : What role does resume and CGPA play for applying to such jobs?**

**Romal :** Resume serves two purposes. Firstly, getting you shortlisted for the interviews and secondly, to give a brief idea of the things you have been working around and are comfortable with. This generally guides the interviewer to choose what to ask and what not to ask from. I personally referred to '*Cracking the coding Interview*' for building my own resume. It contains a number of Do's and Dont's.

CGPA was never a thing to boast about in my resume. For most of the companies it just plays a role in the initial shortlisting. However for research based companies your CG does play a significant role. Though a high CG is a good thing to have, its just an indicative of how disciplined you are rather than a measure of your talent.

**TopTalent : Would you like to share something exclusively for job seekers from elite colleges ?**

**Romal :** Do not restrict yourself to some specific domain or subject, at least not at the undergrad level, but always have an overall sight of things and how they interrelate. Follow your interests and be good at it. Make most of the opportunities you get to learn as a part of your curriculum or through other online sources. And do possess a go-code mindset.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google  
Interview Experience

### Google Interview Experience | Set 2 (Placement Questions)

MCQ Questions: 20 (+4, -1)

Subjective Question: 1

**1) Given four matrices**

P = 20×10

Q = 10×5

R = 5×10

S = 10×10

Find minimum no. of multiplication required for PxQxRxS?

a) 4000

b) 2500

c) 3000

d) None Of These

**2) Two n-size arrays are given . n1 in decreasing order and n2 in increasing order. If c1 is time complexity for n1 using quicksort and c2 is time complexity for n2 using quicksort. Then –**

a) c1 > c2

b) c1 3) If there is a N sorted array then what is time complexity of finding 2 nos having sum less than 1000.

a) O(1)

b) O(n^2)

c) O(n)

d) O(logn)

**4) There are some processes . In which of the scheduling algo CPU utilization is minimum. If I/O burst time is 90ms and CPU burst time is 10ms.(question is very long to remember)**

**5)**

```
int func(int x, int *y, int **z)
{
    int p, q;
```

```

x += 2;
p = *y++;
q = **z++;
q = **z++; //Not a repeated line.
}
void main()
{
    int a = 5, *b, **c;
    b = &a;
    c = &b;
    printf("%d",a);
}

```

**6)** Find the least significant digit of  $2^{3^{\text{google}}}$  where  $\text{google} = 10^{100}$ .

- a) 2
- b) 4
- c) 6
- d) 8

**7)** Let  $w(n)$  and  $A(n)$  denote respectively, the worst case and average case running time of an algorithm executed on an input of size  $n$ . which of the following is ALWAYS TRUE?

- a)  $A(n) = \Omega(W(n))$
- b)  $A(n) = \Theta(W(n))$
- c)  $A(n) = O(W(n))$
- d)  $A(n) = o(W(n))$

**8)** Consider a complete undirected graph with vertex set  $\{0, 1, 2, 3, 4\}$ . Entry  $W_{ij}$  in the matrix  $W$  below is the weight of the edge  $\{i, j\}$ .

0	1	8	1	4
1	0	12	4	9
W =	8	12	0	7 3
1	4	7	0	2
4	9	3	2	0

What is the minimum possible weight of a spanning tree  $T$  in this graph such that vertex 0 is a leaf node in the tree  $T$ ?

- a) 7
- b) 8
- c) 9
- d) 10

**9)** In the graph given in question 8, what is the minimum possible weight of a path  $P$  from vertex 1 to vertex 2 in this graph such that  $P$  contains at most 3 edges?

- a) 7
- b) 8
- c) 9
- d) 10

**10)** A hash table of length 10 uses open addressing with hash function  $h(k)=k \bmod 10$ , and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- a) 46, 42, 34, 52, 23, 33
- b) 34, 42, 23, 52, 33, 46
- c) 46, 34, 42, 23, 52, 33
- d) 42, 46, 33, 23, 34, 52

**11)** How many different insertion sequences of the key values using the same hash function of question 10 and linear probing will result in the hash table shown above?

- a) 10
- b) 20
- c) 30
- d) 40

**12)** The recurrence relation capturing the optimal time of the Tower of Hanoi problem with  $n$  discs is

- a)  $T(n) = 2T(n - 2) + 2$
- b)  $T(n) = 2T(n - 1) + n$
- c)  $T(n) = 2T(n/2) + 1$
- d)  $T(n) = 2T(n - 1) + 1$

**13)** Given three semaphores,  $S_0$ ,  $S_1$  and  $S_2$  initialized as  $S_0=1$ ,  $S_1=0$ ,  $S_2=0$  and processes  $P_0$ ,  $P_1$  and  $P_2$ .

```

P0 : while(true)
P0, P1 and P2.
P0 : while(true)

```

```
{
    wait(S0);
    printf(" 0 ");
    Release(S1);
    Release(S2);
}
P1: while(true)
{
    Wait(S1);
    Release(S2);
}
P2: while(true)
{
    Wait(S2);
    Release(S0);
}
```

Find out how many times the process P0 executes printf statement.

- a) At least twice
- b) Exactly once
- c) Exactly twice
- d) Exactly thrice

**14)** Given the following program construct

```
{
    if ( a == b ) { S1; exit(); }
    else if ( c==d ) { S2; }
    else { S3; exit(); }
    S4;
}
```

Given 4 test cases, find out which one among the following covers all the 4 statements

T1: a, b, c and d are same.

T2: a, b, c and d are all distinct.

T3: a == b and c != d.

T4: a != b and c==d.

- a) T1, T2 & T3;
- b) T1, T4.
- c) T2, T4.
- d) T1, T2 & T4.

**15)** Which of the following statements are true?

- I. Shortest remaining time first scheduling may cause starvation
  - II. Preemptive scheduling may cause starvation
  - III. Round robin is better than FCFS in terms of response time
- a) I only
  - b) I and III only
  - c) II and III only
  - d) I, II and III

**16)** Sequences of logical pages access :

1 2 3 2 4 1 3 2 4 1

Implemented Optimal,LRU,FIFO Page replacement techniques.

Then no. of page faults in :

a) Optimal 17) Find the no. of page faults for Optimal Page replacement technique in the given sequence of question no. 16.

- a) 5
- b) 6
- c) 7
- d) 8

**18)** Given a simple graph of 6 nodes (note- it's a simple graph) then tell which of the following is a set of valid graph degrees.

- a) 4,4,1,1,1,1
- b) 4,4,2,1,1,1
- c) 4,4,2,2,1,1
- d) None

**19)**

```
gcd(n,m)
{
    if (n%m == 0)
        return n;
    n = n%m;
    return gcd ( m, n );
}
```

What is the complexity of calculating gcd(n, m) in worst case?

- a) O(lgn)
- b) O(lgm)
- c) O(lg(lgn))

d)  $O(lg(lgm))$

20)

```
void f(char * x)
{
    x++;
    *x = 'a';
}
int main()
{
    char * str = "hello";
    f(str);
    cout
a) hello
b) hallo
c) allo
d) empty string
```

#### SECTION B – Subjective Question

A knight's tour is a sequence of moves of a knight on a chessboard such that the knight visits every square exactly once. Find all the distinct tours of a knight placed on (x,y) of a NxN

X,Y Knight can go to 8 positions.(default rule). Write a running code.

These questions are contributed by **Harshit Gupta**. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksfor

### GATE CS Corner

#### Company Wise Coding Practice

Interview Experiences  
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Interview Experience

## Google Interview Experience | Set 1 (for Technical Operations Specialist [Tools Team] Adwords, Hyderabad, India)

[My Google Interview Experience, \[Hope this is helpful\]](#)

I am AnandhaKumar .P – 2012 IT pass out from College Of Engineering Guindy, Anna University.

As many of the enthusiastic 2012 engineering passed outs, i too applied for a job in Google jobs page. I know that its very difficult that a resume gets noticed by google. Suddenly one fine day i got a call from Google HR saying that they are interested in my profile and asked me if, i was ready to go with the interview process[Come on! who will say no for Google]. I was surprised.

I was asked to take a initial screen test [Online test].

#### Online Screen Test [2 hours]

I was asked to take the test at 8.30 pm. They fixed this test, a week back. Nobody will call you to remind you to take test. Nor the interviewer will call you. It is your responsibility to check ur mail without fail. On that day I was expecting a call from google from evening till 8.25 pm. None called me. I thought that they would have forgot that. I planned to do go out and have food. But suddenly my ipad gave a alert message and it was from gmail app [thanks for ipad, or else i would not have checked my mail in lap top]. It was from google recruiter. The mail stated that he has shared a doc with me and i must answer the questions in it. a google drive link was given. he mentioned that the test was for 2 hours. I was asked to type answers just below each of these questions.

#### Questions

1. Given a source array of integers with possible duplicates and a target integer, write algorithm to find out 2 numbers in source array whose sum is equal to target integer.

<http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/>

2. Say you have three tables WORK, USERS, MANAGERS

WORK

- work\_id
- user\_id
- how\_much

USERS

- user\_id
- team

MANAGERS

- manager\_id
- team

If I am a manager, write a select statement to retrieve the work of all users who belong to my team. The mapping of user to team and team to manager are defined in the USERS and MANAGERS table.

3. In a Chrome extension, which file contains the most important information of the extension like version, pattern matches, etc.

4. There are three rooms, and there are Princess, Flowers and Snake in those rooms. The doors of all the rooms have incorrect nameplates. i.e., the nameplate for the princess' room is not Princess. Similarly, the nameplate for the Flowers' room is not Flowers. You need to find the room of the Princess without going to the room of Snake. How do you find?

5. Which is faster: finding an item in a hashtable or in a sorted list? And Why?

6. What are some of the most popular Data interchange formats when using APIs

7. Name some popular APIs for each of these

Social

Commerce

Service(like a photo service etc)

8. How would you change the format of all the phone numbers in 1000 static html pages?

9. If you had an opportunity to design the Google Suggest system, please let us know how you would approach it and how you would execute the plan in terms of settings up systems like(data stores or databases, indexing services etc)

10. How do you find out if a number is a power of 2? And how do you know if it is an odd number? Write code in the language of your choice.

**Since i have prepared for tech interviews like amazon, i was able to do it good.**

My sincere thanks to geeksforgeeks[You r doing a great Help]. My entire preparations are only from this site.

After a week i got a call from HR and informed that i cleared the first round .

Then after two days i was told that i will have a telephonic interview with one of the google developers from adwords team .

They scheduled a telephonic interview the next week

**Telephonic interview[i screwed up here ][Design Thinking Interview ] [1 Hour]**

There were two interviewers on phone. First they asked me to run through my resume.

Then the first question came

1) how will improve the **revenue** of the cafeteria of the office.

Lots of discussions went and i think, i really did that well.

2)[Actual question which i screwed up. Bad Time for me]

Number of users in 2010 for adwords, chrome, gmail, android and picassa are in the ratio of 6:9:14:13:8, and in 2011 we add 3 lakh more users. New ratio is 8:12:13:11:6. Number of picassa users in 2011= 1,44,000. Calculate number of adwords users in 2010.

A basic math question that, even a school student can solve. But in that tension i was not able to do it. I took some time and finally gave him a answer. I myself knew that it would be wrong. But interviewer said great lets move on to next question[just to boost up me – good person].

**My actual job role revolves around developing tools for the ad review team which will review the ad and reject illegal ones. So third question was related to that .**

He told me that as i am from a tech background, i need to explain him technically what will i do. He also said that he did not need the actual solution. They will just see the way i approach the problem. That an existing problem and they are open to suggestions.

3) In google adwords there are about 30 million ads from 42 languages . What will i do review the ads and reject ads that do not comply with specific rules .

Regarding the criteria under which google bans a ad as illegal – i discussed about different criteria .

Out of the criteria's i told , he asked me to consider only three criteria .

a) Link not working

b) Drug related ads

c) trademarks[trademark used by the companies]

I gave lot of approaches like for link not working

a) designing a autobot which will automatically click ads link and check whether it is redirecting to correct page or not . Autobots are used by hackers to get money for the ads they posted . I suggested that by designing similar autobot we can validate the link.

b) to check drug related ads –

To detect the language we can first check the geographic location from which the ad is getting posted and can narrow down to some less choices from which we can detect the language

i suggested him that we can create a trie which some specific keywords (like cocaine ) and do pattern matching with that and reject the add if it contains any of the words in trie .

The interviewer gave me another constraint wat if there comes a ad "cocaine rehabilitation center" we should reject those kind of ads na . thats for a good cause . So i suggested him that i can maintain another set of trie which can contain those set of keywords.

Fist check trie1 if drug related keywords exist .

Next check trie 2 if other types of keyword exist.

- if keyword only present in trie1 [reject ad]
- if both tire return true [can reject . but its better that those ad's alone can be subjected to manual evaluation for rejection].

I used trie as it can do the pattern matches faster .

For trademarks also i discussed using similar datastructures and the interviewer was ok with my answer[i thought].

He said that "We are done with here . The HR will contact u later " and asked any questions "i asked few questions about the work they do in google" . and finally i finisched with "Hope u r enjoying in GOOGLE ! " He said "Of course yeah !"

I thought that i did the first and third questions well but screwed the easy second question . i am sure that i will not get selected for the onsite interviews because of that . I told to myself " dont worry yar ! u r not lucky enough to join google !"

a week after i got this mail as expected

**Thank you for your interest in Google. We carefully reviewed your background and experience, and though we do not have a position that is a strong match with your qualifications at this time, we will be keeping your resume active in our system. We will continue to use our database to match your profile with new opportunities and will reach out to you if we find an opening for which you may be qualified.**

Thanks again for your interest in Google's careers and unique culture; we hope you will remain enthusiastic about our company."

I write here because when i got fixed for interview with google for the tech ops specialist role. I searched in net about the interview experience for that post. But i couldn't get it. all i got was the interview experiences for software engineer, adwords posts. SO i think that it will be helpful for someone in future.

This article is compiled by **AnandhaKumar**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Google  
Google Interview  
Interview Experience

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



Meet Prasoon, he was just your average guy who studied at IIIT-Hyderabad but today Prasoon Mishra is one of the most well known 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](#) 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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Walmart

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



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 Sujeeet 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** had a chance to interact with Sujeeet 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, Sujeeet 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](#) his resume by logging in.*

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

**Sujeeet:** 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?**

**Sujeeet:** 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?**

**Sujeeet:** 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!

**Team TopTalent: What was going through your mind when you had to choose one out of those 6 offers?**

**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.

(*Wasn't really a surprise for us. Google seems to be the first choice for most Indian programmers*)

**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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Microsoft  
Samsung  
Tower Research

## [TopTalent.in] Exclusive Interview with Ravi Kiran from BITS, Pilani who got placed in Google, Microsoft and Facebook



Even if we were to search around the world, it would be a truly difficult job to find someone like Ravi Kiran. As a Computer Science Graduate of BITS Pilani – Pilani Campus, he successfully bagged job offers from an astounding three companies – all being some of the best and most admired companies in the world – Google, Facebook and Microsoft. We, at [TopTalent.in](#), managed to talk to this amazingly humble genius, who hails from Hyderabad.

And before we forget, Ravi has also agreed to share his resume with our users so as to help them with their preparation. So don't forget to [grab a copy](#) by logging in. Here is the exclusive interview in its original form.

**Team TopTalent.in: What were the similarities and differences between Google, Microsoft and Facebook Interviews?**

**Ravi:** All three of them share the prestige of being some of the best tech companies in the world. As you would expect, their interviews are designed to ensure the recruitment of top talent. An obvious similarity amongst their interview processes (for undergraduates, at least) is them being vastly algorithmic in nature.

There are multiple interview rounds in each recruitment process. For Microsoft there were 4 while Facebook conducted 3. For Google, I was a previous intern and, hence, faced just 2 rounds. Another noticeable thing was the presence of design questions in one of the rounds by both Microsoft & Google. However, by no means, can this be a generalization to the interview process of any of the companies. At the end of the day, this only reflects how each of them is aiming to assess a candidate's potential to the greatest amount in the shortest period of time.

**Team TopTalent.in: How did you choose between Google, Facebook and Microsoft?**

**Ravi:** The more thought I put in the decision making process, the more confused I got. One of the major things I believed was that none of them was going to be a bad decision, so it was always safe to pick any one of them and not go wrong. Ultimately I chose Google, since I liked it as a company. I must confess that it was mostly a gut-feeling based decision.

**Team TopTalent.in: What is the kind of skill-set that companies like these, are looking for in candidates?**

**Ravi:** Even though I'll keep one of the companies in mind, that is Google, to answer the questions further on, I can safely say that this answer of mine applies vastly to the three of them. The skill-set sought out is that a candidate must be creative, so as to come up with smarter and newer solutions to problems, which are algorithmically very strong and don't waste time solving already solved ones. The candidates are supposed to be, obviously, good at programming so that they can give

shape to their ideas in the form of real code.

**Team TopTalent.in: What should one keep in mind while creating a resume for these tech companies?**

**Ravi:** There are a lot of good references on "What makes a very good resume?" I had searched the same, and stuck to whatever made the most sense. I highly recommend a 1-page crisp resume, so that it's easier to make an impression when someone glances at it for about 3 seconds (I'm guessing that the time spent by a higher-up person on a single resume is nearly that)

In addition, it's very important to make the resume highlight qualities and projects that provide enough reason to believe why you would make the perfect candidate for the job. Prior programming experience and other achievements would be useful to mention, to further your chances of making a good impression.

**Team TopTalent.in: Your advice to all the students out there who're aspiring for job offers similar to yours?**

**Ravi:** I think it's important to enjoy the field of work, and apply to only the companies that align with one's interests. In the long run, it would be hard to work in case the work doesn't go with your interests, even if the company is as nice as three mentioned above. I had never aimed to get into any of these companies, and it has only been a consequence of the activities that I was actively interested in (like competition programming, random problem/puzzle solving, etc) and thoroughly enjoyed.

**Team TopTalent.in: What's the difference between the work allotted in the Indian Office and the US Office?**

**Ravi:** I will speak about this question with respect to Google, since I have an experience in both the offices. The work isn't really any different across the offices. If you have a good project idea, you're always welcome to begin on it, and take it forward irrespective of which office you are from. I myself have had the chance to intern with a very good team back in Bangalore. Work in MTV is going really great too. That being said, the US office has more diverse project choices to offer, merely owing to its larger size.

**Team TopTalent.in: How can freshers/pass outs apply to these tech giants off campus? What's the process involved?**

**Ravi:** Applying off campus is usually a simple process in these days. Most of the companies have websites for application process, wherein one can just submit his/her resume, and expect to be shortlisted. It is important to highlight the efforts of other companies that are providing interview opportunities, through performance in online programming contests.

HR personnel of almost all companies are on a constant lookout for talented programmers, and students performing well in the online programming contests have great potential. A good chunk of people also get an interview call through the employee referral route.

**Team TopTalent.in: And lastly, what are you working on at Google and how has the experience been so far?**

**Ravi:** I work in the Search Infrastructure team at Google, and the journey has been great so far. Google's a fun place to work for, and they ensure to provide one of the best work conditions possible for an employee. It is very surprising how they provide so many amenities – for having fun and indulging in non-work related activities and interests – but at the same time manage to provide some really challenging work.

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## [TopTalent.in] Rushabh Agrawal from BITS Pilani talks about his Google interview experience



Google is consistently chosen as the best workplace in the world and engineers all around the world would simply love to be a part of this amazing and innovative organization. Rushabh Agrawal, a Computer Science graduate from BITS Pilani, recently got recruited by this dream organization in Mountain View, California Office and we, at [TopTalent.in](#) got an opportunity to talk to him. He speaks about his personal reactions (read jubilation), the recruitment process and gives out useful tips & suggestions for all aspirants.

**First question that anybody would ask – How did it all happen?**

The campus placement season at BITS Pilani kicked off with the Google written test on 10th August. He had almost forgotten about it because nobody heard from them for quite some time. But on August 28th, five of the numerous applicants got calls for interviews at the Bengaluru office of Google. And by 6th September they were in India's silicon city for their interviews. I'm sure he would agree with me when I say it was all worth it. After all, 2 of the 5 lucky candidates (Rushabh Agrawal and Kunal Lad) actually got selected for Google's Mountain View office.

When asked about his reaction to the good news, he clearly demonstrated the fact that it will remain an unforgettable day for him. "It was in the afternoon and I had just come back from lunch in the hostel mess; still hungry, given the food that day." And that was when he saw an email informing him of his selection. He remembers the moment clearly, "I spent the next 10 minutes going through the email trying to come to terms with what was written in the email." Within 10 minutes he received a call from the Google HR person to personally inform him about his selection and that was when the joyous feeling finally seeped in. While she went on to describe the package details and terms of joining, Rushabh was too jubilant to care about all that she was saying! His friends and 'wingies' were already shouting and cheering

around him within minutes – all this while the HR lady was speaking to him. He declares that the feeling still remains like a too-good-to-be-true thing.

#### **On whether the selection process is different from the usual campus placement processes.**

We've heard of those brain teasers and super-tough questions from Google's interview. Rushabh disagrees and says the process is more or less similar to companies like Microsoft, Amazon etc. Only difference was in length of the placement process. Usually, when companies come for campus placement, the process gets over within a day, on the campus itself. But Google almost took a month.

There was an initial screening test followed by a series of interviews. All interviews they had at Google were technical and each interviewer tested a different domain of knowledge and thinking. There was an open ended discussion as well, in one of the rounds. Rushabh also had a couple of publications in his kitty and a couple of interviewers discussed about them as well. A very interesting point is that during the complete interview process, there were no eliminations after each interview. All of them went through the same number of interviews. During the interview, the interviewers constantly took down observations/opinions. In his opinion, at the end of the entire process, all the points are tallied to select the candidates. He cheerfully tells us that apart from the interview they got to enjoy the lunch at Google and were put up in a really awesome place for the night.

#### **On the kind of skill-set companies like Google, are looking for in candidates.**

He informs us an in a matter-of-fact way that knowledge of Data Structures and Algorithms are a must, along with decent coding skills. In addition, knowledge of Computer Networks and Object Oriented Programming (OOP) can come in handy as well. Knowing anything else is a bonus. Like in anything else, practice (solving problems in this case) helps a lot. Interviewers generally evaluate a candidate based on his/her response (thinking process, approach) to unknown problems. So they look for problem solving skills as well, in addition to experience. It is a fact that companies like Google look for highly intelligent people. And the resume, along with the interview process, gives them ample opportunities to evaluate a candidate's intelligence.

#### **On how to create a perfect technical resume which would stand out.**

Companies like Google don't care about the candidates' non-technical achievements. So don't clutter your resume by mentioning those. Keep your resume short and crisp. No point explaining everything as they do not "study" your resume (His was a 1 page document). During the interview, the interviewer may glance through it and on finding something interesting, would like to talk about it. This will start a discussion and the conversation, which is now in your hands, offers a good chance to impress the interviewer. Write your resume accordingly (such that it evokes enough curiosity in the mind of the interviewer). Also, you'll obviously want to talk about some of your projects/publications more than the rest. So highlight your work accordingly. Now there's some really specific and useful advice, right?

Interested people would obviously want to know how much preparation goes into winning such great offers. He gives an honest response and says "I didn't prepare for Google specifically apart from going through some of the Google interview questions available online, a couple of days before the interview." According to him, the questions in general are similar to what one would encounter in interviews for Microsoft, Amazon or any other similar company.

"Preparing for placements in general over the summers, worked out good enough for me", he says (practice is the key, evidently) This type of preparation is only to channelize one's thought process for the problems posed during interviews, which are different in nature to what one would otherwise encounter. An important point to note is that the range of questions asked in interviews is not very broad. So the preparation basically familiarizes you with common tricks and stuff that would come into use frequently. Knowing them won't necessarily impress the interviewer but not knowing them would take you a notch below the rest of your competitors. Beyond that, whatever you have done so far – publications, projects, coding experience, etc will come into play. You basically use all the knowledge gained and skills acquired in the past few years.

To conclude we asked Rushabh to give some advice to all the students out there who're aspiring for similar job offers. To start with, he clarifies that that the interviews at Google are not very different from those at Microsoft or Amazon, contrary to popular opinion. He, personally, did not find them "extra difficult" (and he says this on behalf of all 5 who gave the interviews from BPPC)

Also, during the interview, you are not judged by simply your success in reaching the most optimal solution. You are judged on your thought process and failure to reach the final solution is not the end of it, which is important.

For the 1st and 2nd year students, (and many of them have asked him "the recipe" to get a job at Google), a lot coding practice and a very good knowledge of Data-structures and Algorithms to get a job like this is a good way to go forward but not the only way. He, himself, didn't possess a great coding profile but his profile was based more on projects and publications, in things like Machine Learning, rather than algorithms. "What I feel is that you must try to gain as much knowledge and skills as you can. You never know what will come handy." The candidate's intelligence and problem solving ability would take care of the rest. You basically pursue whatever interests you or excites you. There is no long term preparation for getting a particular job and thinking in terms of that would not only restrict you but, also, is too short-sighted an aim to have.

Of course, every aspirant has to spend small amounts of time preparing explicitly for interviews. It's just a great exercise to streamline the thought process. Like any other interview process, a lot depends on factors beyond one's control. As they say, the rest depends on the day.

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## **Yahoo Interview Experience | Set 4 (On-Campus for System Engineer)**

Job Profile : System Engineer (on Campus)

### **Round-1:**

Pen and paper test was conducted. There were about 30 MCQ's. 4 aptitude and 26 technical questions. Technical questions consisted of, Computer Networks, DBMS, Unix, Data-Structures, Algorithms and c/c++ output questions.

### **Round-2:**

Coding round: (120 mins)

(1)print all amicable pairs within a given range.

(2)Related to Shell Scripting and parallel processing of programs.Monitor the memory and CPU usage. If it exceeds 80% warn the user and kill some background processes to stabilize the system.

(3)print the top 5 OS used , top 5 browsers used .

In this round they look at the approach more than the output and efficiency of your code.

#### Round-3

*Technical Interview -1 (30 mins)*

Shell scripting and unix based questions.

Explain the boot procedure.

what happens when you login to linux (how password is validated?).

where are the passwords stored ?

what is /temp , /var , /proc ?

*Few Networking questions were asked:*

what happens when i type yahoo.com in the browser

what is 3 way handshake and how its done ?

Difference between TCP UDP

What is SNMP ?

#### Round-4

*Technical Interview -2 (30 mins)*

The interviewer asked me to choose any two projects where i learnt the most and asked me to explain about it.

OOPS Concepts.

How multiple inheritance is achieved in java ?

write down few unix commands

difference between hub,switch,router

What are integrity constraints in DBMS ? explain

Few Informal questions such as

Why do you want to work at yahoo ?

If i had any offers already ?

#### Round-5

*Technical Interview-3 (20 mins)*

What are servlets?

Difference between servlets and applets ?

Explain Life cycle of a servlet

Explain MVC architecture

Few JDBC concepts

what is proxy DNS server ?

Design question : how would you design a system which would localise web content for a particular region ie display web page in kannada in bangalore and marathi in pune etc..

They look at your approach here and observe how well you consider factors such as cost , space , latency and analyse the problem.

On the whole the interviews were great , the interviewers made me very comfortable.After the third technical round i was asked to wait for the results outside.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Yahoo

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[TopTalent.in] Want to know how to get into Yahoo! ? Read our exclusive Interview with Prabha



"Persistence is what got me this far", says Prabha Satya, Yahoo!'s recent hire for Software Development. Lately Yahoo! is also actively hiring other than acquiring startups one at a time. "I want to make a difference in the field of technology, however small it may be" she explains when asked about her Goal in life. A

graduate from a remote village in Andhra Pradesh to multiple placement offers at IIITB , this week we bring you the story of Prabha who considers herself as a proud Alumnus of IIIT Bangalore.

Want to know how her resume looks like ? You can download it [here](#).

**Could you briefly describe about your student days at IIIT Bangalore ? How is it like to study there?**

**Prabha:** I was a very common student until my B.Tech but it was when I joined IIIT-B for my masters, I had become a true computer science student. It had widened my horizon, made me inquisitive and curious at learning instead of just being bookish.

Coming to my student days over there, they were really challenging. The kind of dedication we used to pay in order to produce some quality work in our projects is so intense. I do remember one course in our college, Web Information Retrieval, which had changed me and my learning process completely with its mandate oriented approach. IIIT-B is the best place I had ever been and it had truly made gaining knowledge as my aspiration.

**What makes Yahoo so special? Why did you decide to join Yahoo?**

**Prabha:** Yahoo! is a great place to work for. The kind of exposure one gets in terms of technologies is both deep and wide. Now, Yahoo! is in a very big transition. And even if small change has to be made, it does not effect just hundreds of users but millions of users, the scale with which it operates is very big. And being able to deal with such a scalability makes it special. The only reason for me to choose Yahoo! is it is very much aligned to my interests.

**Can you describe the complete hiring process of Yahoo?**

**Prabha:** There are several different rounds. First round was a written test which included around 50 objectives, completely technical and no aptitude questions. This round is intended to test the basics in computer science. Next there were two programming rounds. You have to code and solve some algorithmic related questions. Then started my technical interviews. I had about three technical interviews in which first two were completely focused on problem solving and algorithms. Then came the last technical interview, this is mostly aligned towards designing systems. I need to design some real time problems like building an airport system in a best possible approach, best cache system etc., In this round, they also dwelled deep into my projects and electives . All the 3 interview rounds lasted for more than an hour. And it was finally HR round.

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

**Prabha:** In the second technical interview, they gave me a question which should be solved using stacks. I was not able to give the exact solution. I just told all the possible approaches and the best way is to solve using stacks and why is it so. The only thing which matters in technical rounds is our approach to solve the given question. You need to start from the basics and go on discussing with the interviewer till the best possible solution arrives. Most of the time the interviewers help us arriving to the solution.

**What is Yahoo culture like? How does it impact the overall process of working there?**

**Prabha:** Culture in Yahoo! is very much open. There are events where you will get to know what other teams or departments are working on. You are very much welcome to any suggestion before any product reaches the end user. Your work is not just for your team and you can also contribute by making hacks in quarterly hackathons etc., There are lots of chances to contribute ideas not just belonging to your work but anything which makes an impact from the company's perspective.

**Yahoo has been going through a transition phase recently . How do you think this affects the workplace from a career perspective?**

**Prabha:** Yes, after Merissa Mayer took over as CEO, Yahoo! is in a very big transition phase. Developing products from scratch is challenging but developing new features(which are not intended to provide at the start) for any product with minimal changes to the existing base product is even more challenging. It is a great time to work in Yahoo! in terms of learning.

**What were some important factors according to you that made you stand out?**

**Prabha:** Sound basics, developing problem solving abilities, solving algorithms, enough coding skills helped me. Being a technology student one should be able to follow the changing trends, should be ready and willing to learn new stuff every day because change is rapid in the field of technology. Any student who is ready to learn new stuff can lead here. I always enjoyed accepting challenging work and continuous learning. May be that helped.

**Currently, what are you working on and how has been the experience till now?**

**Prabha:** I am currently working for Advertisements and Data platforms in Yahoo!. My work is more towards user data analytics. Got a chance to work on one of the biggest data pipelines in the world. My journey is just started and there are very big technologies within Yahoo! and there are lots to learn for me.

**Your advice to students and job seekers from elite colleges**

**Prabha:** When we are in college, there would be lots of pressure in terms of grades, averages and needless to mention pressure of getting a job and making it big. But only thing which matters is to focus on gaining more knowledge. Do not limit your work just to course work. Try out some new stuff. And at last be curious and inquisitive at what we learn. All these finally pay us.

**Any relevant incident or experience that you like to share through TopTalent?**

**Prabha:** There would be lots of distractions but we should not get blinded by the options while choosing the courses we elect, or the job profiles which we aim for. If you want to choose something, first know what your interests are, what you want to work for and then decide the best possible option. Learn to enjoy the journey by constantly gaining more knowledge out of your interests and by accepting challenging work.

This article is powered by [TopTalent.in](#) – A high end Job portal for students and alumni of Premier Colleges in India. Sign up now for free exclusive access to top notch jobs in India and abroad. Get in touch with them via facebook, twitter or linkedin. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Yahoo

## Yahoo Interview | Set 3

I would like to express my gratitude towards the GeeksforGeeks team, whose help saw me through to Amazon's interview rounds and getting placed at Yahoo.

Number of Rounds: 1 written, 1 coding and 4 interview rounds

**Written Aptitude Round:**

30 questions were given and time was 60 minutes. The questions had varying difficulty. Subjects included Mathematical Aptitude (5-6), Graphs, OOPs, OS, DBMS, Networking and C. Strong subject knowledge was required to clear this round and it was a very tough elimination round.

### Coding Round : 2 hrs

This was 1 of the toughest coding rounds as the only language given was C and we needed to parse a XML file of the following format:

```
<ledger>
<person>
<name>Jai</name><location>Bangalore</location>
</person>
<entries>
<entry><day>1</day><credit>50</credit><debit>40</debit></entry>
....
```

multiple entries were there, and multiple people were there.

We were required to validate the XML file. Open and Close tags matching.

We were required to parse, maintain the max balance for each person, the longest span of days each person had the max balance, and report queries such as who had the overall max balance , his span and location. Span must contain the day numbers, not length.

Part marks were given, at least for 1 person output was expected.

I had implemented a Stack based incremental algorithm which checks as well as fills other data structures to answer the queries. I had modified the input a little to give it a proper structure so that i could use fscanf and sscanf pattern based input from the XML file. After the 2 hrs allocated we were told to explain our code and approach , the pros and cons of the approach, assumptions etc. My interviewer was happy with my approach.

### Interview Round 1 – 1 hour:

Was asked several basic algorithm questions such as in-order is given, what more is needed for creating a tree, add multiple linked list represented decimal numbers etc. Then few Graphs related questions such as a hill is present, few taps are present, all connected to other taps above/below, find which tap will be the last one to get water from a spring on the top of the mountain. At first the graph was a tree structured then he generalized it to graphs. Finally he asked me to implement an efficient Web Crawler with 100 seed URLs. Conditions were added ,define efficiency, how many threads will be needed, mutex/semaphores pros and cons, Data structure required,efficient query on them, Denial of Service avoidance etc. I had prior experience with both Web Crawling and Huge Graph Clustering techniques so was able to answer all questions asked. I would advice everyone to prepare multiple subjects thoroughly, at least OS, Networking and DBMS.

### Interview Round 2 – 30 minutes:

It was basically a test of my OOPs knowledge, was told to approach the XML parsing in OO paradigm. Design a couple of classes, explained all the basic OO fundamentals were being followed. Interviewer continued to ask me to do better, no hints were provided, he was not completely satisfied but felt the design was sufficient.

### HR-Semi Technical Interview Round 3 – 30 minutes:

All round questions were asked from background to future prospects, and I had an internship in IIT KGP, so was asked about the project and how my project could contribute to the real world. Do prepare your projects specially the motivation behind it.

### HR Interview with Manager – 30 minutes :

Questions like how can you improve this Interview procedure, what challenges will you face when you join us, how can you make us better were asked.

After my final round, an hour later the results were announced. I and another one of my peers got HIRED 😊

This article is compiled by Pratyay Banerjee. Many Many congratulations to Pratyay. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Yahoo

## Yahoo Interview | Set 3

Hi, I am Saurav Biswas, from IIT Kharagpur, currently doing my PhD in Machine Learning in Germany. I got hired at Yahoo SDC, India, in December (3rd to be precise) last year, through campus interviews. I was offered a position for Senior Software Engineer.

Interview consisted of a written test comprising of 25 objective questions, a coding round and then three technical and an HR round.

Here is the list of interviews in chronological order :

### Round 1 : Written test

The round comprised of 25 objective questions from basic Algorithms , Data Structures , OS , Networking , databases and a few math puzzles. From this round, 20 people were selected for the next coding round . This written round was held sometime in the middle of November .

### Round 2 : Coding

We were given an hour, and the problem was something like given a set of 2 dimensional pairs of points (floats/doubles) find out the two nearest points, for each point. I used recursive divide and conquer approach to solve it in  $O(n \lg n)$  time. Later I was told to generalize the code for n points (pseudo code ) after my algo passed the test cases successfully .

From the coding round around 10 people were selected for the PI round of technical interviews .

### Technical Interviews :

#### Round 1 :

I was posed a few questions on linked lists which I easily answered . The last question was that suppose you have implemented a search engine , you want to find if a

URL typed by you is present in the cache of URLs that you have , more or less you have to give an optimized algo for it . I had read about suffix trees , the night before ( my good luck ) and I managed to code the problem with relative ease . The interviewer was satisfied and I qualified for the second Technical Interview .

#### Round 2 :

This time , the interviewer posed a math puzzle . I don't remember it exactly , but it was something that the problem when framed mathematically would yield you an inequality in two variables , and you had to solve for the two unknowns . Initially I was in a fix , but the interviewer was kind enough to suggest me that i solve it heuristically . I started with base cases and proceeded up and finally the solution converged after a few iterations . The interviewer was satisfied . He then talked about what I would like to work on if I got an offer from Yahoo . Coming from a machine learning background , I was interested in working on the Yahoo Search Engine and he said he would definitely look into it . I was through that round .

#### Round 3 :

This time , the interviewer focused on Networking , OS and OOP concepts . I was asked to code the multiple Producer / Consumer problem , which I did . Then he asked a few questions on OOP , like difference between overloading and Overriding , virtual and friend functions and so forth . There was also a question on Iterators in JAVA . I had a strong grasp on OOP so I answered them . Finally he said he would like to ask me a question from Networking . He told me to explain the Leaky Bucket Algorithm . I didn't know about it , so I said maybe he could ask me something else . So he asked me about TCP Three Way handshake . I did so more or less well .

#### Final Round : HR

The HR Interview was casual , asking me about personal interests , hobbies ( I told I played the guitar ) and what I would bring to if offered a job in Yahoo . She also asked me if I had any other companies in hand . I had none so I said I would like to go with the offer if I got it .

So finally I was hired in the position of a Senior Software Engineer . But I got a PhD offer from Germany in Machine Learning , so I declined the offer later in June .

As a note of advise to fellow aspirants , I would say that please read up Cormen and Tenenbaum for Algo / DS . I personally would like to thank g4g for their wonderful collection which is also a must . It helped me a lot too . Also people tend to screw up questions from OS/ Networking so keep basics like Synchronization, Process handling , Deadlocks , Memory management , TCP/IP clear . Read basic stuff for databases like primary keys , normalization and that should be it . Refer to xkcd for standard math puzzles .

Best of luck to all.

This article is compiled by **Saurav Biswas**. Many Many congratulations to Saurav 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.

## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
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[Yahoo](#)

## Yahoo Interview | Set 2

First of all a big thanks to the geeksforgeeks team. It has been the biggest help in my preparation. Till 5th july i could not write a simple program of tree traversal. But just the arrays, linked list, tree, string, DP and backtracking tabs of g4g helped me reach the interview rounds of Amazon (i was eliminated though) and getting placed at Yahoo.

Following is the list of my interview questions.

**Date of Interviews:** 28th July 2012

**No of Rounds:** 1 aptitude test, 1 lab test, 4 interview rounds

**Type of Interviews:** Campus Interview for freshers

#### Aptitude Test (1 hour)

25 MCQs with no negative marking. 2/3 questions on probability.

Others were related to output of recursive programs and string related codes. Then there were questions based on graphs, OS and networking.

#### Lab test (2.5hours almost)

The lab test had two sections each comprising of 2 questions. Attempting one from both sections was must to qualify but there was no restriction on attempting more. Section 2 was very easy.

#### Section 1:

**Question 1-** Given a file system tree like the one given below, write a program to: a) represent it in memory, and b) find the size of all files in any given path. For example:

```
Input: /etc/vpnc
Output: 114
Input: /etc
Output: 188
Root->/etc->/etc/sysconf->networks 23 bytes
    eth0 32 bytes
    eth1 19bytes
/etc/vpnc->
    Prf1 12bytes
    Prf2 102 bytes
/home->/home/user1->
    F1 99bytes
    F2 33bytes
/home/user2->
```

**Question 2:** Given below is a list of smart phones with price and a set of features (app,style,speed) rated in a scale of 0 to 9. You might want to normalize the price on a scale 0-9 where 9 is the maximum price of all phones in the list. Write a program that will take a phone as input and output the three most similar phones. For comparing phones use price and a weighted score of all features as distinct dimensions.

Input- nokia lumia

Output: galaxy note, galaxy sII, iphone 4s

Product	Price	App	Style	Speed
Nokia lumia	32000	7	8	7
Galaxy S II	29000	9	7	6
HTC One	18000	9	6	5
Xperia Mini	13000	7	6	5
Xperia Pro	18500	7	7	7
Black Berry Bold	26500	6	6	7
Nokia N8	19000	5	6	5
Galaxy Note	33000	9	8	7
Iphone 4s	36000	9	9	8

Use the following weights to rank each feature:

App-0.3

Style-0.3

Speed-0.4

My solution:- I calculated the weighted average of the 3 features and assumed them to be a point on x-axis. Scaled down the prices by a factor of 1000 and assumed it to be y-axis. Now whenever an input was given I simply found out the 3 closest points from the given phone's co-ordinates.

### Section 2:

**Q3.** Split a perfect circular linked list (where the last node's next pointer points the first node) in two equal parts (if the total no. of nodes is odd, say  $2m+1$ , then the first half should contain  $m+1$  nodes).

**Q4.** Suppose we have an array whose length is not known. The content of the array is such that the first of the entries are 0s and the rest are all 1s. Write a function which will take this array as a parameter and return the number of 0s.

When the coding was over, they came over and checked the codes, output and were marking on code clarity, coding style and output.

### Interview round 1: (30-35mins)

Initially I was asked 2/3 questions from the aptitude test we appeared in the morning and had to explain how I reached that particular answer.

He took an intro then enquired about favorite subjects and almost the entire interview was based on OS (memory management, scheduling everything was asked).

One good question was **implementing a LRU cache**. I was not supposed to code it but had to give the entire idea.

Then there were several questions on C/JAVA.

Then he asked a question on networking and I clearly answered I don't know anything other than the name of layers. So he asked me to speak a line about all of them.

### Interview round 2: (30 mins)

In this round too the interviewer started with a question on networking and once again I told him the same answer. Then he asked me questions from data structure. One of them was difference between merge sort and quick sort. Which one would you prefer and why? Do you really need the auxiliary space in merge sort?

Then questions were asked from DBMS' file storage.

### Interview round 3: (15 mins)

This interview was quite casual. Questions like which yahoo product do you use? What are its shortcomings? (Well I just gave him a whole list of flaws of yahoo messenger ☺ :P)

The next question was to give an idea of a product I would like to make.

### Interview round 4: (15 mins)

This was an HR round. Basically personal questions were asked. One question that was disturbing was what would be that 1 company given an option you would flunk yahoo. Initially I was bit diplomatic and answered "I always wanted to get in any one of Amazon, Microsoft, Adobe or yahoo (the big 4 who come to my college). And I have been eliminated from Amazon 2 days ago". Then honestly answered him but if I really have an option I will choose MS. ☺

After some time got the result. I was hired.

This article is compiled by **Saket Saurav Pathak**. Many Many congratulations to Saket 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.

## GATE CS Corner Company Wise Coding Practice

# Yahoo Interview | Set 1

Following are the details of my Yahoo interviews.

**Date of Interviews:** 28th July 2012

**No of Rounds:** 1 aptitude test, 1 lab test, 2 technical rounds and 2 HR rounds.

**Type of Interviews:** Campus Interview for freshers

## Aptitude Test(60 mins)

25 questions were there. Questions mainly consisted of c outputs, greedy algorithms, graphs, puzzle, probability, complex function name etc.

Few questions were like, number of possible graphs with n vertices, questions related to invertex and outvertex of graph, outputs where comma is used as an operator etc.

There was not negative marking.

## Lab Test(150 mins)

Lab test involved coding the given problems in c or c++ or java and running it in linux environment. It consisted of 2 sections in which 1st section was comparatively harder than 2nd section. You are expected to atleast attempt one question from each section to qualify. The more questions you attempt, more you score but you have to attempt from both sections.

### Section – 1

**Question 1:** It was based on file and directory structure. Cannot recall what was the exact question.

**Question 2:** 9 mobiles are given whose name, cost and 3 other features were provided on scale of 9. You have to treat cost as 1 dimension and three other features as another dimension(their respective weightage was given). When the user enters a name of mobile, the name of another 3 mobiles should be displayed based on how similar they are to given mobile on the basis of dimension 1 and dimension 2 of the mobile.

### Section – 2

**Question 1:** Given a circular linked list, you have to split the linked list into two another circular linked list. If it contains  $2n+1$  nodes, then first list should contain  $n+1$  nodes and second list should contain  $n$  nodes.

**Question 2:** You have to count the number of first contiguous 0s of an array. The size of array is not given.

*After the completion of given time, they asked us to explain our code. They were looking for clarity of code, whether it was giving right output and they checked for corner cases also.*

## Technical Round- I

The interviewer asked me to solve a few questions from the set of 25 questions that were there in the aptitude test.

He further asked my favourite subject and began to ask questions from there. He then asked questions from OS, DBMS and networking.

## Technical Round- II

Here also 2-3 questions of the aptitude test were asked. He asked which subjects I like. I mentioned data structure, networking and DBMS.

To my surprise, he started asking me questions from OS. The questions were not quite hard. They were based on semaphores, synchronization, virtual memory, paging, faulting, and deadlock. It was just that I was not well prepared in OS. That round went pretty average and that was end of it.

The guys who qualified for the next 2 HR rounds were all hired. In the HR round, questions such as personal strengths, weakness etc were asked. It was a bit casual.

Tough Luck again....

This article is compiled by Vinay Khetan. We will be soon publishing Vinay's Microsoft interviews as a separate post. Vinay was selected in Microsoft. Many Many congratulations to Vinay for his selection.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Yahoo

# Cisco Interview Experience | Set 16 (On Campus – Advisory Services)

## ROUND -1

I. What are you interested in? cs programming or networking.(as I am from cse so he wanted to know)

II. Different routing protocols with their functionalities

III. Difference between ARP & RARP

IV. What is DNS & its services? Why DNS & ARP is different when both searches for the IP address?

V. What is your strong part in networks?(I told subnetting,masking,finding addresses)

So he gave me one address format & asked to find the first valid host address

Eg.192.168.233.145/27,find first valid host,broadcast,subnet address.

VI. TCP & UDP. how the connections are made in these cases?

VII. Write the code to implement circular linked list.

\*\*\*performance was not up to the mark & shifted to IT field for next round interview.

**ROUND-2(HR)**

- I. How did I get this college
- II. Tell me about your project
- III. Field of interest
- IV. Difference between pointers & arrays
- V. Why am I so much interested in mathematics (as I have mentioned in resume about so many participations & achievements in mathematical competition )

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

# Cisco Interview Experience | Set 15 (On Campus – Software Engineer)

(Role: Software Engineer)

**Round 1:**

1. Tell me about yourself.(Spoke until the interviewer browsed through the resume).
2. Reversing a singly linked list.
3. Check whether the given array of elements is a heap or not.
4. Write test cases for both questions and explain how you go about to generate test cases.

**Round 2:**

1. Storage classes in C. Where do you use them?
2. volatile keyword and its usage in C and Java.
3. What does static do in case of static variable and static function.
4. Write a recursive function to print the numbers from 1 to 100 with the parameter passed being 100 using recursion. Explain the recursive stack.
5. Explain what happens when an interrupt occurs. Also explain the various layers and events involved when a process context switch occurs.

Note: All the above questions were not directly asked. They were asked based on different scenarios.(Except in case of the recursion stack question).

**Round 3:**

1. What is the best example that one can use to explain the concept of networking to a layman?
2. Why Cisco?
3. What is your field of interest?
4. What designation do you prefer?
5. Questions about things in my resume(Asked me to speak in German, why not go for higher studies as I had written that I was a member of Higher Education Forum).
6. Questions about project.
7. What other company interviews did you attend? Why did you fail to be selected?

**Round 4:**

1. Tell me what was your most difficult obstacle in life and how did you overcome it? What were the preparations that you made?
2. Areas of interest.
3. Where do you prefer to be placed? (Had option to be placed in Bangalore/Pune).

Result: Placed as Software Engineer in Cisco.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

# Cisco Interview Experience | Set 14 (On Campus)

**First round Technical**

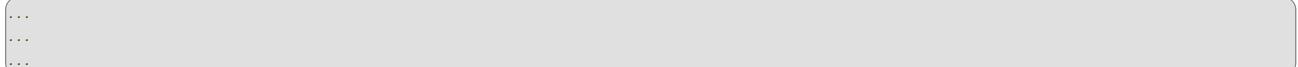
1. Write a code for bubble sort.
2. What are the osi layers and explain them.
3. What are pointers.

4. A puzzle : We have two pits with capacities of 5 and 4. How will you measure 2 litres of water with these pots.

Soln: Fill 5 litre pot and pour the contents into four litre pot. So we are left with 1litre in 5 litre pot and 4 litres in 4 litre pot. Empty the contents of the four litre pot and pour the contents of 5 litre pot(1 litre) into 4 litre pot. Now again fill the 5 litre pot and pour the contents into the 4 litre pot until it becomes full. So now we have 3+1 litres in four litre pot and 5-3=2 litres in 5 litre pot.

**Second round**

1. Given 9 dots how will u connect all these with just 4 lines without taking off your hand.



2. In a car race what will your position be if you overtake the last person. You can't overtake the last person unless it is a circular track.

#### Next Round

1. Questions about resume and projects.

2. Find the nth bit of a number.

Soln. given a number a;

Let b=1;

Shift b to the left n-1 times.  $b \ll n-1$

$C = a \& b;$

If c is true then the nth bit is 1 or else the nth bit is zero.

3. Given a 8 bit register with values ranging from 0-100. How much bits can be allocated for precision

4. Difference between void main(); and void main(void); – <http://www.geeksforgeeks.org/difference-int-main-int-mainvoid/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

## Cisco Interview Experience | Set 13 ( On Campus – for Advanced Services)

1) What do you think the role of AS in CISCO

2) Tell me your favourite protocol [I said TCP]

3) What are the features of TCP?

4) What is meant by a connection oriented protocol?

5) How is connection established?

6) Draw the states [three way handshake] of connection establishment.

7) What is routing?

8) TCP works on which layer?

9) What are the functions of TCP on Data Link Layer?

10) Tell me a routing algorithm you know. Explain the algorithm.

11) Why should routing be done separately from connection establishment?

12) Give some practical applications where TCP and UDP are used.

13) Why do we use UDP?

14) What is IP and its significance?

15) Given a subnet address, find the last host address and subnet mask.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

## Cisco Interview Experience | Set 12

### Round 1- (Written)

There were 50 MCQ questions including aptitude, technical portions. Aptitude part was more dominant with approximately 35 questions & almost 15 technical questions. These questions covered following topics :-

– Quantitative **aptitude** (relative speed, distance topic had 4-5 questions & rest 1-2 question from each topic). Questions were not very difficult but were tricky .

– English – Questions containing Paragraph of 4-5 lines. We have to select the best suited summary / heading/ meaning/ conveyed message for above . Atmost 4 questions were from this category.

– **Technical aptitude** – Questions from computer networks (4-5 questions) , operating system( semaphore , deadlock) 2-3 questions , rest questions from microprocessor , FET & other electronics topic.

**Tips** :- Time management plays crucial role in this round.

Aptitude questions were logical & complex calculations were not required.

### Round 2-(Technical Interview)

1) Given a string, reverse it.. Firstly, i told an O(n) approach then reduced it to O(n/2). This was just ice breaking question very easy.

2) List all Permutation of a String. Approach & code.

<http://www.geeksforgeeks.org/permuations-of-a-given-string-using-stl/>

3) You are given huge amount of integer data & a continuous stream of data is coming. How will you find kth largest element always.

At first i started with quick select , then was asked to think better. Then, my next approach was taking an amount of data like 10MB always & using Merge Sort to sort the large amount of data. But then i realized it could be made better by using priority queue of size k. So, i gave them this approach of taking k size priority queue & every time an element greater than the smallest element in the queue comes we replace it by new element. They were satisfied with this approach.

4) Projects –

Many questions were asked on my projects. Few situations were given & I was supposed to do some modification on one of my project database to handle these situations.

Other project related technical questions were asked .

Why have you used a particular technology / DB in a project .

5) Find a missing no. From n-1 given no. Where numbers are in range 1 to n.

<http://www.geeksforgeeks.org/find-the-missing-number/>

6) Above question was extended to finding 2 missing numbers.

7) Puzzle

1 1 1

2 2 2

3 3 3

4 4 4

5 5 5

6 6 6

This is given. Make rows equal to 6 using any operators in between numbers. Example –  $2+2+2=6$  using “+” operator.

**Note:** Not all rows can be made to 6 , you must be able to tell this 1 1 1 can't be done..

$3 * 3 - 3 = 6$  & so on.

8) How will you handle a situation when 1 of the team member is not performing their task.

9) What will be your approach when you are put in a running project & a fresh project.

10) What the basic features one need to keep in mind while starting the development of an e-comm. website. (One of my project was on e-commerce website may be thats why this approach was asked).

11) Explain architecture of your projects.

For this question, be prepared with various flow diagram, dfd, class diagram , & also basic block diagram of your projects.

12) Do you have any question?

Tips:- Have your basics strong & clear.

Pay attention on improving Data-Structures & Algorithms.

One must have a clarity on projects.

Most importantly, be calm , humble & polite. Interviewers are mostly helpful.

Be a good Listener, understand the question first & ask valid doubts.

### Round 3- ( Managerial Round)

1) Why cisco?

2) What are your future plans related with further studies?

3) (If you have any experience), why you left your previous job?

4) How can we trust you with this job since you had quit your previous job also?

5) What do you know about work culture at cisco?

6) Have you faced any situation where your team member were not cooperating?

8) Do you have any questions?

### Round 4- ( HR )

1) Introduce yourself?

2) How will you define yourself in 1 word?

3) What are your big achievements professionally & personally?

4) What is the 1 thing that you want to improve in yourself?

5) What is your worst decision till date?

6) Do you have any location constraints?

7) Do you have any questions?

Tips:- Know yourself before any interview.

Be calm & answer politely.

Thank you **GeeksforGeeks** for your wonderful archives, without which this would be very difficult. GeeksforGeeks have contributed immensely in increasing my knowledge & improving my skills. Thank You Geeks team.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

### Cisco Interview Experience | Set 11 (Network Consultant Engineer)

There were total 5 rounds in the process:

#### 1st round :

50 MCQ were asked, topics were basic aptitude questions on series, venn diagram, train problem, C output questions on pointers, C string manipulation questions, 4-5 electronics questions(for non-cs background). First attempt easy questions don't waste time on difficult questions. No negative marking, test was on mettl platform

#### 2nd round : (around 45 – 60 min) Technical interview

They asked about networking concepts like addressing subnetting, CIDR, Remote booting, ARP, DHCP, RARP, loopback address and some logical/reasoning questions on network topologies, MAC address and MAC layer, asked how will you rate yourself in Java/C they check basic programming knowledge.

#### 3rd round(45- 60 min) : Technical round

They asked about project mentioned in resume, as most of my project were based on networks so I was able to answer their questions easily. They asked various technical aspects of project and how we achieved our goal.(they asked me to write any script which wrote in project)

#### 4th round : Managerial round

It was a stress interview, they checked patience level of candidate, they tried to contradict me on various topics and asked me answer them correctly, One should answer these type of questions without losing temper.

#### 5th round : HR round

They asked about hobbies, discussed about role, my role in project, any conflict of thoughts in project.

Finally I was selected

Cisco hiring team is experienced, they make us feel comfortable in the interview process.

All the best

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

### Cisco Interview Experience | Set 10 (On-Campus for Internship)

Hi everyone, recently CISCO visited our campus for a summer internship for pre-final year students(3rd year single degree + 4th year dual).

#### 1st round (MCQ)

The 1st round was a MCQ round consisting of 50 problems in 1 hour. The questions were from aptitude, Data structures, microprocessors and some common puzzles like the Josephus and the Queens problem. The questions were fairly intermediate however being a CS student I didn't know much about the MicroProcessors questions. They selected around 10 students for the interview round. There was only 1 round of interview which lasted around an hour for each one of us. The platform for the test was mettl.com

#### 2nd round (Technical F2F)

The interview started with the general Tell me about Yourself. He mainly wanted to know my subjects and fields of interest.

From there he moved straight to the projects on my resume.(10 min)

I did electives on Information Retrieval and Machine Learning and the next 10min were spent on this.

He gave a DSA question. You are given a sorted array and your objective is to construct a BST out of it. The constructed BST should have the shortest possible height. I had to first explain my approach to the problem and when he was convinced I was asked to write the full code for the problem. I later found this question on GFG: <http://www.geeksforgeeks.org/sorted-array-to-balanced-bst/>

(20 min)

Next followed few discussions on Graph Algorithms. Explain Djikstra, real life applications, limitations of djikstra (fails when negative edges), solution for negative edges(Bellman Ford), explain Bellman Ford. (10min)

Next I was asked about my favourite language. When I answered C++ a few theory questions followed. What are friend functions, virtual functions, auto pointers and a few questions on classes.

If classB inherits from classA, A and B both have a function func1(), object is made as A obj = new B();, if we call obj.func1() which one will get called. I answered B's one but then he wanted to know why and the internal structure of C++ in such a scenario. Please reply in the comments if you have a proper answer. (10min)

The interview ended with a few HR questions like why CISCO, future objectives and goals, etc

Surprisingly they didn't ask any of us any Networking questions. Might be because we are still doing our networking course this sem.

My only tip from this experience would be when you read questions on GFG try not only finding a solution but also coding the solution and that too on paper. Its really tough to write code on paper when you have your interviewer over your head looking at your every step.

Also be clear with all the projects present in your resume. One of my projects used a long mathematical formula and he even wanted to know about the formula.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Cisco

### Cisco Interview Experience | Set 9 (For Experienced)

Written Test:

- 1) 15 Aptitude Questions
- 2) 25 CS Fundamentals & Couple of output questions.

3) Coding Question: A thief trying to escape from a jail has to cross 'N' walls each with varying heights. He climbs 'X' feet every time. But, due to the slippery nature of those walls, every times he slips back by 'Y' feet. Now the input is given as  $(N, \{H_1, H_2, H_3, \dots, H_n\}, X, Y)$ . Calculate the total number of jumps required to cross all walls and escape from the jail.

F2F 1

- 1) Calculate the number of bits set to 1 in a binary number.

2) Unsorted array and a position 'P'. Return the element that is likely to come to the given location upon sorting the array. Do it  $O(n)$ .

3) Many question regarding UNIX N/W programming. Doesn't need to worry. If you know already is advantageous.

4) Shared memory, OS concepts, IPC mechanisms. Which among is the fastest IPC

F2F 2

- 1) Questions related to projects.

2) Given a big C program, point out various storage classes.

3) Explain the DS which is well suited to implement UNIX commands like PWD, LS, MKDIR, CD in an imaginary OS. No code required. Just the DS.

F2F 3

Entire round is dedicated to projects.

F2F 4:

With team manager: Why you want to switch. Explained the work. Which team you want to join.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Cisco

### Cisco Interview Experience | Set 8 (On-Campus)

Hello everyone! Cisco came to our campus for full time hiring of final year students. They had shortlisted candidates for the interviews on the basis of written test which consisted of MCQs. There were 50 questions out of which there were 20 aptitude questions, 15 questions on C, Computer Networking and Data Structures and the rest 15 questions were from digital electronics, BJT, CMOS and Microprocessor. We were given only 1 hour for this.

Since, the cutoff was quite high, therefore one has to concentrate both on accuracy and speed.

#### First Round (F/F)-1 hr

The interview started with the introduction, after which he moved on to my projects and asked about the data structures and algorithms used to implement the project. After then he asked questions from Operating Systems like Coffman's Rule, context-switching, processes versus threads, interrupts, semaphore, mutual exclusion, concurrency, deadlock, etc. After then he asked some questions from Computer Networking like TCP versus UDP, what happens when you type a URL, flags of TCP, ping and traceroute, etc.

After then he asked me how much you rate yourself in C and further asked me to write a code for insertion sort using linked list. Then he asked me to look at the code and search for the corner cases and errors if any. Actually, my function had a void return type and he was worried that my head pointer is not getting updated. But I answered him that it will get updated as my head pointer was globally declared and he was satisfied. Then he asked if I had any questions for him. I asked him 2-3 questions and later I came to know that he was my alumni and then we further talked about the life at Cisco.

#### Second Round (F/F)-75 minutes

This interview of mine was taken by the Production Manager. He started-off as if the round was HR, by asking me my introduction, strengths and weaknesses, why Cisco? , etc.

He, then, asked me about the questions covered in the last round. Then he had given me a question to code. The question was that you have been given an array of length N and window of length M which slides over the array. You have to compute the average of the elements in the window for each movement. Initially I started off with the brute force and ultimately reached to the solution he wanted. He then asked me the advantage of starting from brute force. I replied that at-least I have a solution to work upon.

Then he asked me the designing questions (I didn't remember what exactly the question was) and further asked me to code a trie. He then asked me about hash-maps and heaps. And ultimately he asked me whether I had any questions to ask.

#### Third Round (F/F)-15 minutes

The HR was just a formality. The HR manager started-off with my introduction, family background, do you have any problem in relocation? , how do you take personal conflicts? , strengths and weaknesses, then asked me if I am available for intern in the 8th semester and I indirectly said No to her (As such there are no norms in the

college but for you I will ask my T&P department and I will call you back accordingly ). And then she asked me to spell my email id and finally asked me to wait outside for the final result.

By then, I was sure that the profile in which she wanted me to fit in had no vacancy and ultimately the result was announced and as expected, my name was not there : (.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

### Cisco Interview | Set 7(On-Campus)

Status: Full Time job + 6 month internship offered.

It was a 4 round interview. The first round was a written round with 50 questions(20 aptitude + 30 technical) for 1 hour. The second round was a technical round(1 hour). The third was a technical + management round(20 mins).The fourth round was a short HR round(10 mins).

In the **first round**, 20 aptitude comprised of simple-medium-complex aptitude questions. Some were answerable within 10 seconds, some took 30-40 seconds and the harder ones took slightly over a minute to solve. The questions were based on all the classic aptitude topics. Some questions were stated in a confusing way, but other than that, no hiccups were present. The technical side had 30 questions. roughly about 10 from C, C++, OS were asked, another 5-6 were from electronics side. Around 5 from networking topics and the rest were based on data structures, complexity estimation, and topics around that. I was able to answer most of the aptitude questions(17-18) were correct out of 20 and more than 22 questions were right out of 30 in the technical side. I think the cutoff for the second round was around the 40 mark, which i had gotten and i made it to the second round.

In the **second round**, the interview started off with simpler, shorter questions, like for example the interviewer pointed to one of the technical questions in the previous round(the interviewer has your answer sheet from the previous round) and asked me to explain the approach i had taken to solve the problem. The question he asked me to explain was a recursive function, and i had to estimate the worst case time complexity of the function. the function was something like this.

```
function(params)
{
    ...//terminating condition
    else...
    return function(params-1) + function(params-1)
}
```

The answer to this was  $O(2^n)$ . The interviewer modified the question to this:

```
return (function(params-1) + function(params-1)) * function(params-1)
```

The complexity of this was  $O(3^n)$ . He asked me to derive it on paper which i did. The next question was regarding how to set the nth bit in a 32bit-integer. The answer was pretty straight forward. variable | 1 4 Then the answer would be: / \ 1357264 2 6 / \ / 1 3 5 7

After taking a few hints from the interviewer i was able to code it up without errors.

The next question was to print the tree in a zig-zag manner. ie:

for the tree above the zig-zag traversal would yield: 4267531.

After thinking for some time, hints from the interviewer, i was able to code this up as well.

Basically by this time 1 hour was up. The key points the interviewer looked for, was my approach to the problem, error-less coding, All corner cases must be taken care of while implementing the program. The most important thing is you should be sure of your solution. The interviewer asks you if the solution is right or wrong, here he is checking your confidence, try to dry run the program once or twice after coding it up, this would help with the confidence. Also , try to speak as much to the interviewer about your thought process, this not only gives a better opinion to the interviewer, but if you tell him where your stuck, he/she might give you clues to proceed further.

After answering all the questions with hints from the interviewer , i qualified for the next round.

In the **third round**, The technical-management round., the key focus was your thought process, they were not too keen about the technicality of the solutions. The interviewer asked me what were my favorite topics, and i replied data-structures and algorithms. Then he asked me to code up a part of a social network were people were nodes and different types of connections existed between them. my job was to write functions to connect any two nodes of the graph, and also another function to check if 2 nodes are directly or indirectly(transitively) connected.

I asked him, whether all these edges/connections were directed or undirected, so he asked me to assume they were undirected for simplicity. Then i was asked to come up with a data structure to handle these operations. It was obvious that it was a graph structure and the nodes had user details and a edge-list inside it.

the socialGraph class had a insertion,deletion functions and connect(node\*,node\*) ,

isconnected(node\*,node\*) functions as friend functions to connect 2 nodes and check if 2 nodes are connected. connect function was straight forward ,as i had to append node reference to the edge-list of the node.

Then to check if 2 nodes are connected, i did a DFS from the source node to the destination node. The interviewer asked me to make the code such that it could scale. So i suggested that we could do a A\* search instead of a DFS to make the search space smaller. The interviewer seemed satisfied with my solutions and then we moved on to the other questions. He asked me about my projects, the roles i have played in various clubs in the college, my future plans, why Cisco? and other simple questions like that.

I did well enough to get qualified for the **final round** which was a casual HR round where they asked simple questions like the meaning of my name ☺ and then i was given a evaluation form to fill, and they asked me some questions on that which i could answer.

The interview overall was reasonable, but certainly made me think out of my shoes, and strong knowledge in Data structures and algorithms helped me pass this interview.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

### Cisco Interview | Set 6

<http://geeksforgeeks.org/> has a major role coming out to placement preparation if you want yourself to be placed in the reputed companies one thing that i will suggest is Be well versed in core cs concepts.Try to get profound knowledge in subjects like.

- .operating systems
- .computer networks
- .discrete mathematics
- programming languages like c,c++,
- .lastly Algorithms(especially graph algos)

Coming out to my interview experience with Cisco systems,my first round was mostly on computer networks fundamentals such as sub netting,super netting and on some network protocols like Go-back-N etc.,

Second round was also in networking but this time there was some in depth questions mostly pertaining to why layers and what are their advantages, explain dhcp in detail etc.,

and my last round was some coding questions which were mostly from [GeeksforGeeks – A computer science portal for geeks](#)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco

### Cisco Interview | Set 5

Interview consists of one written and two technical rounds followed by HR round.

Written Test : Total 50 questions

Aptitude : 20

Technical : 30

cutoff : 29 marks. aptitude – around 9,10, Technical – 22

#### Aptitude Questions :

[Mainly covered on topics like basic probability question, functions, propositional logic, finding number with help of statement, simple passage, basic permutation]

1. Aptitude means everyone starts with speed and distance, train problems, boats and cisterns, Time and work but here there was no questions on these topics.

2. Simple questions on conditional probability like

X having 5 chips with 1 defective, Y having 4 chips with 2 defective what is the probability of selecting 1 defective chip out of 9 chips that to from Y.

3. simple problems on Propositional logic

$p \rightarrow q$   $V p \rightarrow r$  how many set of values for this logic gives true value

Ans – 7

4. two set {1,2,3,4} and {4,5} total number of elements in cartesian product of these two sets.

5. If a digit square is divided by half of the number then its quotient is divided by and it is added by 36 then.... you can search questions of this type.

6. Two white ball and 3 red ball in box a, 3 red and 4 white in box b, probability of selecting white ball from box b.

7. Simple passage questions.

#### Technical :

Subject – [logic design, computer networks, os, datastructure, algorithms]

1. 12,54,86,78,13 how many swaps you need if you sort this using bubble sort.

2. Which of the following are valid coding schemes

a)Manchester

b)3B/2

c)4B/2B

3. Basic theoretical question on ADC

4. Have a look on ICs like 8241,8251, question was which one comes under this group something like that

5.  $ab'c+a'b'c+a'b'c+a'b'c'$  minimize this expression

6. question based on memory mapped i/o definition

7. simple question os synchronization

8. page replacement

9. question on thrashing concept

10. worst case  $n^2$  and best nlogn which sort ? -quick sort

11. networks – which of the following are switch forwarding approach

a) cut through b) store and forward

ans – cut through

12) have a look at switch,hub,router,bridge and osi layer

14) how many hosts u can accomodate in 192.168.1.43/21

15) os – context switch, deadlock

#### Technical round:

Revise OS, B.Tech or M.Tech projects, data structure,

Program to find substring.

Network questions like DNS, OSI, DHCP

OS – InterProcess communication, Process, Deadlock, Garbage collection, Algorithm – Dijkstra's algorithm,

Datastructure – Linked list questions

Tips and books- [Gate questions](#), [Data Structure made easy by Narasimha Karumanchi](#), [Timothy J. Williams computer science MCQ](#).

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Interview Experiences  
Cisco  
Interview Experience

## Cisco Interview | Set 4

Cisco Interview Process:

#### Round 1:

50 MCQs

Duration: 1 hr

20 – Math Aptitude. 30 – Technical

Technical part included questions from Computer organization, Some problems from OS(finding logical address), Networks (problem on finding transmission latency), 8085 Microprocessor, 2-3 C++ (finding output/error), MOSFET, Direct Memory Access, etc.

[ I don't remember any question exactly. But the question paper was very tough!! I did the math well. But I wasn't sure of most answers in the technical part. Never expected to get selected! ]

#### Round 2:

Face to face interview- Technical

Duration: 1 hr

There were questions from OS, Data structures, Aptitude, Networks, and some C questions.

Some questions that I still remember were:

1. Given a sorted array a[] find the pairs of number that add up to x.

For eg: a[]={1,2,4,5,8,15,18,22} x=20

Output: (2,18) , (5,15)

2. Given

unsigned char c=1100 0010; (Note that it's a variable ; not an array.)

U need to reverse this and return the result.

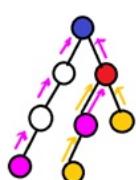
Answer: 0100 0011 (Stored in a variable. No arrays have to be used.)

3. How will you set a bit in a number?

Eg. int i=1110 0001. Set 6th bit.

Output: 1110 0101

4. Given a tree (not a BST), pointers to any 2 nodes in the tree, how will you find their least common ancestor?



In the above diagram, least common ancestor of the nodes in pink is the one in blue. For the nodes in yellow, red is the LCA.

For Eg: You will be given the pointers to the nodes in pink. You need return the address of the node in blue.

Each node has the following structure:

```
struct node
{
    int data;
    struct node* left,*right;
    struct node* parent; // Pointer to the parent node
};
```

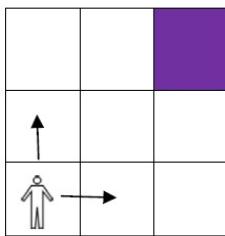
5. What is the difference between logical and physical addresses?

6. Some questions related to web designing.(As I had mentioned it in my areas of interest.)

7. What happens in the background when you type the URL www.google.com ? You need to answer it with respect to the 7 layers of OSI architecture.

8. Given an n x n grid,

Say n=3



You are standing in the left bottom corner. You need to reach the destination in the top right corner. You can move either in upward or east direction (as specified in the diagram). In how many possible combinations can you reach there? Your answer should be generic to any value of n.

[I did the technical round really well and the interviewer was happy with my performance.?]

#### **Round 2:**

Partial HR, Partial Technical

Duration: 45 minutes

Questions were mostly about my areas of interest, projects. As I kept explaining him about my projects he asked me to write some code snippets for those. And many questions were from OS, Networks like:

1. When does a process create a child process?
2. What happens in the background when fork() / pthread system call is used?
3. What are the different IPC mechanisms?
4. How does a pipe work? What happens when pipe symbol '| is used in command line?
5. What is compaction and what are its disadvantages?
6. What are the steps in establishing socket connection in client & server side?

He asked me how much I like network programming and whether I could do it in Linux.

Some questions that were purely HR were:

1. What are the 3 most valuable things you have learnt in your engineering college?
2. How will you convince your team member to accept your idea/suggestion?
3. What will you do if your team member always conflicts your ideas and reports you to the manager?
4. What kind of job do you wish for?
5. What will make you quit a job?
6. You prefer being in the Technical / Managerial side?
7. Other possible questions from my resume (Responsibilities undertaken, Achievements)

#### **Round 3:**

It was a complete HR.

Duration: 50 minutes

Questions were about me, my family, areas of interests, extra-curricular activities, other interests, projects. He was talking about Cisco for about 20 minutes.

That was all!

On the whole, clearing the written test was the toughest part. Technical – if you are really good at data structures and basics of networking, OS – it's easy to crack it !

I got my results by around 1:30 midnight! Hired 😊

Thank You sooo much GeeksforGeeks.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Cisco  
Interview Experience

## **Cisco Interview | Set 3**

I recently got interviewed for a position in Cisco. The organization came to our college for on-campus recruitment.

#### **First round:**

The first round had 30 technical and 20 easy aptitude questions to be answered in an hour. It was intended to test how fast you can solve problems. Majority of the technical questions were from Electronics, Computer architecture, and some questions from C and data structure.

#### **First Face to face interview:**

The interviewer was really a nice person and she wanted to know where really you are good at. First, She handed me a C code snippets asked me to explain what the snippet does. Those were very easy.

Then she asked me to perform nibble wise swap in a byte of data. I considered it as a string and did normal swap of data. She wasn't happy and asked me to try some other method. Suddenly, I thought of doing it in bit-wise

num = num>> 4 | numSecond face to face interview:

Luckily, the interviewer I got this time was even more friendly.

Given a flash memory where you can perform read or write only sector-wise (you can't read a particular byte/ word in a sector). Write a function to write a word to particular sector. The answer is very simple if you use bit-wise operation.

Then he asked what happens when a CPU is powered, how bootstrap works and interrupt vectors.

He too was very happy and the interview was very short when compared to others. My friends were interviewed for more than one and half hour.

#### Final HR round:

My friends who attended HR interview told me that it was 'stress' interview where interviewer tests your patience and see how you behave under pressure. About unfortunately I didn't undergo any pressure test. The interview was like 3-4 minutes, he asked general questions like "Why CISCO?", "How you see yourself in CISCO after 5 years".

Then results came, I was hired

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco  
Interview Experience

## Cisco Interview | Set 2

I recently got interviewed for a position in Cisco. The organization came to our college as part of their University recruitment program. The following is my interview experience. Hope this would help you !!

### Round 1

This was aptitude + technical round. 20 question from aptitude and 30 questions technical. We were given 60 minutes to solve the question. NO NEGATIVE MARKING.

The aptitude question were relatively easy. There was a cat and tunnel problem. A question on Venn diagrams was calculation based, 4 different event on Venn diagram. Some questions on ratio and proportion, probability, and arrangement, time and work, time speed distance, number system. One can easily crack this section if one has practiced questions from any quantitative aptitude practice material.

The aptitude part was such that many were able to crack it, but the technical part was the actual make or break part. The questions were vary basic questions but from a wide variety of areas such as electronics – analog and digital. Questions on FET, BJT, MOS, K-map, microprocessor, networking etc, along with data structures, operating system, and algorithms were there. These questions touched the basic concepts of all the areas we had studied in our curriculum so far.

Some of the questions I still remember:

The data structure question was on inserting a node in middle of linked list, wherein we were given four options and we had to chose the correct code for the corresponding operations.

The algorithms question was based on time complexity. Say there is a program whose time complexity is  $O(n^{2.5})$ , then which of the following can't be true. Following this there were four statements, of which three said that the time would grow proportional to Round 2

My first technical interview round- around 1 hour 15 min. The interviewer glanced at my resume. First question- tell me about yourself

Then he came onto the projects. He asked question on what I did in the project, how I did it and what all I gained from it.

Then some questions on networking basic-7 layers of networking, OSI architecture, difference between frame and packet, routing and switching.

Then he asked Kruskal minimum spanning tree algorithm and its application in networking. Then some question on bit magic- counting set bits in an integer, finding absolute value of integer, some questions on OOP- encapsulation, polymorphism. Then what is data encryption and its difference from encapsulation. Encapsulation in Java. Polymorphism in Java example.

### Round 3

My second technical interview round- around 45 min Again the interviewer came onto projects. He asked me about cryptography, and data transmission, TCP, UDP.

Why TCP better than UDP? What is flow control and congestion control? How do networks ensure congestion control?

What is the difference between Router and Bridge and Gateway?

What is the difference between router and switch?

How does a network ensure that all the packet reach in correct order, which layer is responsible for it. If you were to do be made responsible for packet delivery in correct order how would you ensure without the help of any underlying layer. Explain AES, DES and triple DES(I was asked this because of my project on cryptography). How would you ensure that all your data AES-encrypted is not decrypted using any other mechanism for a software implementing all three mechanism mentioned above. I answered some way out but the interviewer kept on finding faults in each of the ways.

Finally he asked me draw my attention on Google, how does it encrypt mails using different schemes and how client server architecture works, and then I was able to get through to the authorization technique he was seeking for as the answer along with different port number and process id for different schemes. This earned me some brownie points. But in the entire interview, the interviewer kept on dis-agreeing to the answers so as to check one's confidence level.

Then he asked me to check if string is palindrome or not. Then a question on DP. Then a question on recursive programming. Then another on in-line functions-their internal implementation and difference from macros. Some question on OS- processes and thread, what is the difference between them, concurrency and what is semaphore. What is starvation. What is masters theorem – explain the underlying cases. I managed to keep my calm till the end and answered many of the question correctly.

### Round 4

My third technical interview round- around 30 min. The interviewer asked me about layers in OSI and IP architecture and complete details of application of each layer along with protocols used in them. Then he asked me about the NIC -how it works and the internal implementation. What happens when you connect a pc over a new network. What is CSMA-CD with example.

Quick sort-pivot selection. What is Counting sort. What is hashing. Explain all types pf hashing schemes. How does free determine how many numbers to de-allocate.

Question on determining the subnet mask over a large network consisting of several sub-networks with a specified IP range available to ISP.

#### Round 5

My last round -HR round general questions. How important Is this job fr you? What if you don't get it?

What are your other interest? I am the Microsoft student partner of my alma mater, so he asked what was the procedure. What all were the difficulties? What can you do if I make you the Cisco student partner. This was followed by my contribution in college events. What kind of expectation you have from this job and what would you gain, of which you have been deprived of so far. Tell me your one major quality and link it to recent event

I answered all the question, and he was satisfied with responses.

Finally, despite not being a computers-major student, HIRED

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Cisco  
Interview Experience

## Cisco Interview | Set 1

The interview process consisted of 4 rounds.

### Round 1: APTITUDE + C + ELECTRONICS MCQs (No negative marking)

The aptitude questions had a good mix of probability, speed and time, clocks, numbers, mixtures, time and work etc.

**Tip:** For clearing aptitude rounds, make sure you have great speed in solving quantitative aptitude. This is what differentiates you from the rest of the lot.

Maintain time in all your aptitude practice sessions.

The C questions were very conceptual. Unlike other companies, it did not have output tracing questions. It had questions on asymptotic complexity, recurrence relations and the like.

**Tip:** For clearing C questions, practice dry-running of complex codes, you'll be able to trace better during the test.

Solve as many questions as you can.

Make note of the new concepts that you come across every day- this will help during last minute revision.

The questions from Electronics were not so easy to crack for Computer Science students. However, if you brush through basic concepts before exam, it will be relatively easier to even guess the right answer: P

The questions revolved around logic gates, FET, thermal runaway, voltage-current characteristics of diode and the like.

**Tip:** Since there is no negative marking, make an intelligent guess and mark all questions even if you aren't very sure of the answers.

I was shortlisted among close to 40 others for the next round!

After you clear the written test, there will be a select few you need to compete with. Make the most of this chance.

### Round 2: Technical Interview (50 minutes)

I was interviewed at around 8 pm. Most of you will begin to feel tired even before your interview starts, but just hang in there and gather all your energy that you have. Keep your mind fresh.

This round went on for around 50 minutes for me. A few of the questions were:

- Write code to reverse a linked list recursively

After I wrote the code, the interviewer wrote a piece of code and tried telling me that his code was simpler, hence better – but I immediately found a flaw with his code (the headptr wasn't handled after reversal). He wasn't really expecting that out of me, so he stopped for a minute and added a couple of lines to make his code alright ☺

There I scored a brownie by using my presence of mind: D

- Write a code to Multiply a number by 7 without using \* operator
- Write a code to Multiply a number by 8 without using \* operator
- Write a code & pseudo code to find the minimum spanning tree
- RSA Algorithm (very intricate questions from here – what is the significance of phi(n) etc)
- Diffie Hellman Algorithm
- Trace route program implementation (Detailed questions about TTL), ping etc
- IP Headers
- Network Protocols
- Euclidean theorem
- Euler's totient function

A lot more questions were asked that covered OS, Networking, Data Structures, C, and C++

### **Round 3: Technical Interview (50 minutes)**

This was again a technical pen and paper coding round. A few of the questions were:

- The interviewer asked me to write a code for the famous game Brainvita (Those who you who haven't played this game can look up <http://www.youtube.com/watch?v=GSWI4ZSq6q8> to understand about it)

This was a very lengthy program (handling all boundary cases) which required a very in-depth understanding of 2-D matrices.

- Big Endian to Little Endian Conversion

This required concepts of masking and bit-wise operators. After I came up with a code to do the same, I was asked to reduce the space complexity to O(1). 2 minutes of thinking and I managed to do crack it !

The interviewer applauded me for coming up with the most optimal solution possible for this that is used in the industry.

A few more questions on OS were asked and the interviewer was pretty satisfied with the answers.

**Tips for writing code:**

-> Remember to comment and indent your code even when you are writing the code on paper

-> Handle all boundary cases well

-> Keep your code legible- don't scribble. A neat code shows you are confident and clear about your code

-> Dry-run your code alongside before you ask your interviewer to review it

-> If you don't get the logic in the first shot, just THINK ALOUD and let your interviewer know how you approach to solve the problem

-> Even if you know the code from before-hand, don't show that to him, work it out in front of him such that you are doing it for the first time.

-> Ideally, you should start from the brute-force solution and then progress to optimizing the time and space complexity. This shows an in-depth understanding of complexity analysis.

### **Round 4: HR Interview (40 minutes approx.)**

Here your communication skills will be put to test. I love public speaking and having been a Toastmaster for 3 years now, this was a cake walk for me. I thoroughly enjoyed this round though this was at 1 AM in the night (morning :P)

I was asked about my future plans, the leadership responsibilities I have held and my learning experience out of them.

This round was mostly based on resume – my accomplishments as a Toastmaster and how managed to stay on Rank 1 throughout my academic life etc. (Basically it was all about me)

**Tips:**

- Make sure you have actually done whatever is there on your resume
- Do NOT even give the slightest hint to the interviewer that you might be even remotely interested in further studies right now (I am assuming that since you are sitting for placements- you don't want to go for higher studies right now)
- Be prepared with 1 strength and 1 weakness of yours
- Know your hobbies and passion
- Showcase sense of humor and be at ease
- Speak confidently
- DO NOT be rude/ sarcastic with the interviewer. It might be a stress test , so just maintain your calm
- Read up about the company in detail to answer why XYZ company?
- Be prepared with questions to ask them when they ask you – Do you have any questions? (Sound intelligent and sensible – ask about your job responsibility/ work culture etc.)
- Follow the Pre-placement talk keenly (It helped me in my HR round)
- SMILE

[Recommended Preparation material:](#)

- Your own Resume ☺ -Make sure you know every bit of it (including the Objective – which should be self-written)
- Company website

And finally, results were announced at around 2 AM—— but trust me it was totally worth the wait!

I hopped on board with CISCO and here my journey begins ...

Thanks a lot to geeksforgeeks ! ☺ It helped me a lot in my interview process !

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## **GATE CS Corner   Company Wise Coding Practice**

# Morgan Stanley Interview | Set 26 (Off-Campus)

## Round 1: (Online Coding contest on Hackerrank )

Time -24 hours

There were 6 questions of increasing level of difficulty.

<https://www.hackerrank.com/contests/morgan-stanley-2015/challenges>

I think Top 150 across all over India were selected. ('caz my rank was under 150)

## Round 2: (Skype Round) – Time – 45+ minutes

1. Tell me about yourself.
2. Briefly describe the projects you have worked up on.
3. Describe polymorphism and its type. How virtual function is being implemented and what is virtual table, is it static/ dynamic and why? What is vptr? Is there multiple virtual table or single virtual table in inheritance hierarchy and why so?
4. Design Facebook. It was an open ended question in which one has to only give his thoughts regarding the data structures which you would like to use while designing and how it's being implemented.
5. You are given multiple tabs in your browser, you have to design such a system that when you close one tab then it jumps back to last visited tab just before it. New tabs can also be opened. Eg. If you have three tabs – youtube.com, google.com, yahoo.com respectively opened in your browser and you are on yahoo.com, from yahoo.com you switched to google.com, (in here if you close google tab then you should jump to yahoo.com not youtube.com) Now you open gmail.com in a new tab (in here if you close gmail tab then you should go back to google.com).
6. What is LRU (Least Recently Used)? Implement it.
7. A few question regarding scenario where one should use multithreading.

Result of this round was declared after 7 days.

## Round 3: (Technical Round – 1)- Time – 45 minutes

This was a face to face round.

1. Write a program to form a palindrome from a given string.
2. Write recursive and iterative code for finding factorial and which one is better.
3. Write a program to find the next higher number from a given number in the form of array (eg: 4955 as 4,9,5,5 next higher number – 5,4,5,9)

## Round 4: (Technical Round – 2) Time – 45 minutes

1. Briefly describe the projects you have worked up on.
2. What is Data Structure? Explain Map. What happens when one tries to insert a value corresponding to a key if it's already present in your map
3. What's the difference between Object Oriented Programming language and Procedural language
4. What is stack and heap? Where these memory reside. (He simply wanted to know about the memory layout)
5. Difference between linked list and arrays. Which one will be preferable in which scenario and why?

Few other questions which I can't recall at this time.

## Round 5: (Professional fitment)- Time – 45 minutes

1. Introduce yourself.
2. He brought a question along with him which i couldn't recall right now but it was basically involving sorting and then finding maximum increasing subsequence. I coded it on paper.
3. Given you a chance, what one problem you would like to solve in the country at present time?
4. What is your weakness and what measures are you taking to overcome it?
5. Have you ever lead (I said yes) then he asked how did you perform, what hurdles came in your way and how did you tackle them?
6. Are you having any offer from other company (I said yes) so he asked, would you leave your present company & why?
7. What do you know about Morgan Stanley?

Then he asked me if I have any question.

## Round 6: (HR round) – Time – 45 minutes

1. Why Morgan Stanley? Is it 'caz of money or you have interest in finance?
2. What is your dream?
3. Describe the biggest problem you have ever faced in your life and how you tackled that?
4. How do you see yourself in five year from now? How long are you going to work in the technical field or you have any plan of switching to something else like management in future?
5. How do you rate yourself in the communication skill?
6. What do you think are the requirements for the job and to be successful in it?
7. A brief discussion about my one project.

In the end he asked me if I have any question and I asked to which he replied quite gently.

Conclusion: Company looks more at how you talk than what you know. Their whole mantra is, "we can teach you about technology but we can't teach you to be confident, talk to people, not be a mean, etc." So keep that in mind. It's okay if you don't know the answer to a question but don't just say "I don't know". They loves stories so let your inner J.K. Rowling out! All in all, be confident, smile a lot, don't be nervous, and stay calm! That will take you very far in the job process! Good luck everyone! I considered the interview as "difficult". My reason was not that the questions were difficult, but rather that you

have 4+ interviews so it becomes difficult to keep the energy going, not to repeat yourself too much, come across personable, etc. Hope that helps!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

### Morgan Stanley Interview | Set 25 (Off-Campus)

I applied in Morgan Stanley through codeathon which is a coding contest conducted on hackerrank.

Round 1(coding round)

There were 6 algorithmic questions. Around 20 students were selected for further rounds of interview. I was one of them.

Round 2(telephonic interview)

Interviewer was quite friendly. He asked about my internship projects and questions based on oops concepts. Small snippets of code in Java, C and C++ were written by him on the shared screen and I was asked to tell the output and the logic. Then he asked me to write a simple code of printing the nodes at a given level in a binary search tree. He also asked the logic, network model used and design to implement the "code pair" feature of hackerrank(the shared screen which we were using).After this, I got a call for the face to face round.

Round 3(F2F technical interview)

The interview started with a detailed discussion on one of my projects for like about half an hour. He asked my preference of language to which I answered C++. He asked some questions on C++ concepts. He then asked me to write the logic of inserting a name in a sorted manner in a very large file containing the names of students in sorted order using file commands. Detailed discussion on multithreading and its implementation. Questions on machine learning were also asked like implementation of svm, what is linear regression etc. because I mentioned this subject in my interests. Some simple sql queries were also asked.

Round 4(HR round)

The interviewer was very friendly. He started the discussion asking if I have any offers from the college and the reason of not having. He also asked why I was not able to perform when Morgan Stanley visited the campus. Basic HR questions asking why Morgan Stanley, why should we hire you, any challenging thing you did in your life etc. The interview was ended with a basic design problem of designing the elevator system with the classes, their attributes, methods and relationship among them defined in the class diagram.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

### Morgan Stanley Interview | Set 24 (On-Campus for Internship)

Recently Morgan Stanley visited our campus for internship. Here is my experience.

**Round 1 (Coding and Aptitude- Online Test 75 minutes):**

19 MCQ on C++, DSA concepts and few aptitude questions

2 Coding Questions

Both questions could be solved using DP.

15 out of 27 students were shortlisted for next round.

**Round 2 (F2F):**

Interviewer was quite friendly. First he asked about two of my projects from my resume. Then he asked me to choose any of my favorite programming language. It was C++ for me. So following questions were asked:

What is inheritance? Explain with an example. (Wrote sample code on paper)

What is friend class and friend function? When do we use them? Explain with one example. (Again wrote code on paper)

Then he asked about which one questions you couldn't do in first round. I told it could be done with DP. Then he asked difference between DP and recursion. Again asked to write a code for pow(x,y) using DP and recursion and calculate time complexity.

Last questions was on OS. Given a list of numbers (total size of list is 2GB) and RAM size is 1 GB. Can you find the max of these numbers? (Obviously yes) Then how? and then name some of page replacement algorithms.

Finally 6 of us were selected for final round.

**Round 3 (F2F):**

This time also the interviewer was very friendly. He first talked about extra curricular activities and other things to make me comfortable. Following three questions were then asked:

1. When you type in search box on Google, it automatically gives you some suggestions. What data structures and algorithms will you use, to provide search suggestions. The discussion went on for 10-15 minutes with slight variations in problem statement. (He was satisfied with answers)

2. Similar to facebook friend suggestions. What DSAs will you use to suggest friends? How can you improve if you don't need the best solution. (I couldn't improve much)

3. There is an intersection of two perpendicular roads. The traffic can be either up-down or right-left. But both traffics can't be together. You just have to put traffic light with two signals only (Red and Green). The question is simply to implement a switch to turn on/off traffic on each side. (A simple synchronization problem).

Answered using semaphores and threads. Wrote code for the same. Interviewer was very happy and convinced from this.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Morgan Stanley

# Morgan Stanley Interview | Set 23 (On-Campus for Full Time Technology Analyst)

Morgan Stanley recently visited our campus for Full time Technology Analyst. Process took 5 rounds.

### Round 1 Aptitude and Coding test

Test had 19 MCQs and 2 coding questions. MCQs had negative marking. Questions were mainly asked on Data Structures, OS and Databases. Coding questions were good. One was easy and second was a DP problem with moderate difficulty.

About 15 students were shortlisted.

### Round 2 Technical Interview

Interviewer in this round just wanted to check my concepts and basics.

First he asked me about heaps and told me to write algorithm for heapify. Its complexity etc.

Then he asked me about sparse matrix and how we can optimize space where we don't require cells below diagonal. I told him a hashmap approach and then we discussed about internal working of hashmaps.

Then he told me he wanted to multiply two such sparse matrices and asked me to write a code to multiply two matrices where each matrix is a hashmap. Asked time complexities etc

Then he asked me to design a class diagram where there are many manufacturers and each of them manufactures different vehicles like cars, bikes etc.

Also he asked me all kinds of joins. Then he came to C++ and asked about virtual functions and how java is different from C++ in this case.

Asked a good SQL query. At first I was not able to understand what it did. After a hint I got the answer.

I was able to answer almost all questions.

About 4 students were shortlisted.

### Round 3 Group Activity

As MORGAN STANLEY's legacy, gave LEGO BLOCKS and said to come up with an idea and you want to impress your investors with your idea so they will invest in your project idea.

### Round 4 Technical Interview

I was told to design a class diagram for Olympics Racing game. Every minor detail was taken into account. Then told me to design a ER diagram for a student registration for different courses. Then he asked me to map ER to tables. Asked me Normalization concepts and why it is important. Also told me to normalize tables. Then OS questions were asked like what is semaphore. Binary and Counting semaphore? Then he gave me a scenario and asked whether binary or counting semaphore would solve the problem. Then he asked some system calls. Gave me a program with 4 forks and asked me number of processes created. After that he asked me to distinguish grandfather, father and child process. Asked me to write a code where the process created during first fork should not execute other forks below it and so on. After some hints I got the answer.

### Round 5 HR Interview

Asked me about my internships, projects.

Why your CPI is low?

Why Morgan Stanley?

What are your views on our recruitment process and how can we improve it?

Strengths? Weaknesses?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

# Morgan Stanley Interview | Set 22 (For PPO)

I had done an 8-week summer internship at Morgan Stanley, Bengaluru. Unlike other companies which give Pre-Placement Offers to the interns on the basis of the work done and manager's feedback, Morgan Stanley conducts interviews for the same.

There were 3 rounds of interviews for everyone. The interviews were held in the penultimate week of the internship. All the interviewers were Vice Presidents at Morgan Stanley.

### 1. Technical Interview

There were 2 interviewers. The questions asked were:

\*Explain in brief about your intern project.

\*Implement any SQL query in any suitable language(preferably C/C++/Java), using suitable data structures for implementation as well as storing the result. The SQL

query may contain joins of various tables. (Written Code)  
\*What is malloc?  
\*Static and dynamic memory allocation in C.  
\*Some questions based on pointers in C.  
\*A code was given, based on pointers in C, tell whether the code will run perfectly or generate some compilation/runtime error.  
\*Stack and heap memory in C.  
\*Find factorial of a number, considering all the base cases as well as big input. (Written Code)  
\*What is normalization in databases? Why is it helpful?  
\*What are Collections in Java?  
\*Which data structure in Java would be used, such that infinitely many elements could be added, depending on the choice of the user, and the elements should be accessed directly, in O(1) time (Indirectly, a hybrid of Array and LinkedList). Implement the same data structure in C.  
\*You are given a 4 GB RAM. How would you run 20 GB processes using this 4 GB RAM? (OS – Virtual Memory concept)  
\*What are threads and processes?  
\*How different is C# from other languages?  
\*How a program gets compiled and run?  
\*Explain the various stages that happen during the compilation of a program.  
\*How a program gets compiled and run in C?  
\*How a program gets compiled and run in Java?  
\*What is JVM? Explain in detail.  
\*What is JRE and JDK?

## 2. Technical + HR Interview

There were 2 interviewers. The questions asked were:

\*Explain in detail about your intern project.  
\*Using Object-Oriented concepts, design a college academic system, containing students, details of every student, departments, details of every departments, courses available, and much more. After creating the necessary classes, methods and variables for this system, create appropriate methods to find the topper of a particular department, rank of a particular student, topper of a subject etc. An ideal object-oriented code in Java was expected. (Written Code)  
\*How was your experience at Morgan Stanley?  
\*Your feedback of your team members?  
\*Your favorite subject  
and many more.

## 3. Pro-fit(Professional Fitness) / HR Interview

\*Tell me about yourself.  
\*How was your experience at Morgan Stanley?  
\*Explain in brief about your intern project.  
\*Did your team members help you?  
\*Any qualities that your team members need to improve upon.  
\*What are your strengths and weaknesses?  
\*Have you ever lead a team? Your leadership experience.  
\*Have you ever had any conflicts in opinions? With juniors? With seniors?  
\*Why should we hire you?  
and many more typical HR questions.

Finally, they gave Pre-Placement Offers to 10 out of 28 interns.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

## Morgan Stanley Interview | Set 21 (On-Campus for Internship)

Morgan Stanley visited our college to hire summer interns (3rd year students).

Firstly, an online test was conducted (90 minutes duration) on HackerRank, consisting of 19 MCQs (Data Structures, C concepts, programming concepts, data interpretation, verbal skills) and 2 coding questions (One based on string manipulation and other based on All-Pair Shortest Path Graph).  
12 out of around 100 students were shortlisted for the interviews.

There were 3 rounds of interviews.

### 1. HR Interview

This was my first interview ever (I had given many vivas during my school years, but never gave an interview before), so I was feeling pretty nervous.

The interviewer asked if I was feeling nervous, to which, I replied "Yeah, somewhat nervous!". The questions that followed were:

\*Tell me about yourself.  
\*What do you know about Morgan Stanley?  
\*What did you do in your summers, at the end of 2nd year?  
\*Your CodeChef and HackerRank rank.

\*Tell me any one incident of your life that you feel is regretful?

\*Apart from Morgan Stanley, were you interested in any other companies?

\*Why Morgan Stanley?

\*Your strengths.

\*How do you see yourself 5 years from now?

and many more such kind of questions.

Then I asked him whether we'd choose our preferred location(Mumbai or Bengaluru) or would they allot us randomly, and on the life at Morgan Stanley.

## 2. Technical Interview

\*Explain Call by Value and Call by Reference, using call stack, giving suitable examples. (Written Code)

\*Is it possible to find the factorial of a given number without using any loop or recursion?(Written Code)

\*Given a binary tree, print all the boundary nodes, i.e., all the leftmost, rightmost, and leaf nodes.(Written Code)

\*What do you know about Operating Systems?

\*Differences between Windows and Linux, advantages of Linux over Windows.

\*Explain about the Task Manager and its various processes.

\*Threads and processes.

\*Difference between the operation of Chrome and Firefox.

\*Differences between C and C#.

\*Explain Linked Lists in detail.

\*What will you prefer for Stack implementation- Arrays or Linked Lists?

\*Given a processor, which is running various processes simultaneously, of different time duration. These processes are stored in a circular linked list of fixed size. There are processes in waiting as well, which are stored in a queue. We have to print the id number of processes that have just finished, and add the waiting process from the queue to this circular linked list. At the same time, the time duration of other processes get reduced by some fixed amount. Repeat this till the queue as well as circular linked list gets exhausted(out of elements). (Written Code)

Then I asked him about the projects that we'll be working on. He was a friendly person and told me about many live projects that they generally give to interns at Morgan Stanley. He also explained in detail about the project he is currently working on.

## 3. Technical + HR Interview

Firstly, the interviewer asked me what do I know about Morgan Stanley and its functioning and provided services in brief.

Then he asked me about my favourite topic, to which I replied Data Structures.

What are stacks and queues?

What is OOP?

Then he gave me a real-life scenario of managing a lift/elevator system. You have 3 lifts, and one control on each floor, i.e., the same up-down button can call any of the 3 lifts. Design the system, considering various factors in mind, like how to prioritize the selection of lifts, on the basis of the floor difference or on the basis of time, or on some other basis. Then he gave me some examples of floor numbers where the lift gets called, and the initial position of the lift, and asked me how I would handle these scenarios. It was a long discussion, lasting for about 15-20 minutes, where he gave me various situations and asked my approach. Basically, he just wanted to know my thought process, and my approach and logic towards solving such real-life scenarios. Then at last, he asked me the data structure I would be using for this implementation, to which I replied 'Doubly Linked List'.

He then asked some HR questions:

\*What are your strengths?

\*What are your weaknesses?

\*Why Morgan Stanley?

and many more.

Selected 5 students for the internship.

Overall, it was a good experience, and a memorable one too!

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## GATE CS Corner Company Wise Coding Practice

Internship  
Morgan Stanley

## Morgan Stanley Interview | Set 20 (On-Campus)

Morgan Stanley came for Full Time recruitment for Software Associate in our campus.

### Round 1

Online test on HackerRank contains 19 MCQ (DS, OS, DBMS, and Reasoning etc.)2 Coding Questions

1. Count the number of changes in LED Light when display one digit after another of a given number. (Initially all LED is off)

Example:

Given number – 082

Answer: 9

Explanation: Initially 0 has 6 LED On, then for 8 we will turn on 1 more LED, then for 2 we turn off two LEDs so  $6+1+2 = 9$ .

2. Given an array on n integers containing numbers 1,2,3 & 4 where

1 is No work is done

2 is A work is done

3 is B work is done

4 is either A or B work is done

Find the minimum number of free days such that no same work can take place two days simultaneously.

Those who done 1 coding question complete and at least 6 MCA correct are selected for next round.

23 are shortlisted for direct interview. I was one of them.

## Round 2

Face to Face Technical Interview Round (50 minutes)

1. Tell me about yourself?
2. Discussion on 2nd coding question of round 1 with better approaches.
3. Given 10 computers and 20 persons who want to use these computers, what type of scheduling you will use?
4. What if a person using a computer ask for more time in between?
5. Which type of scheduling is done in Windows 10 OS?
6. How google chrome tabs are loaded through scheduling?
7. Give a parking lot which can contain n cars at max. Each parking area is of different size. Only the car of that size can park in that area (neither smaller nor bigger). Design a data structure with program on how you will tell the incoming cars to park at what position and also which cars you can neglect.  
Example –  
Park = {2,1,2,3,3,4,2,4,1} (Size of Park Area)  
Cars = {1,2,5,1,2,4,2,3,2,1} (Size of Car)  
Solution: Car – Index  
1 – 1, 2 – 0, 5 – NA, 1 – 8, 2 – 2, 4 – 5, 2 – 6, 3 – 3, 2 – NA, 1 – NA
8. Design a Database of student, subject and marks and describe various keys and attributes.

### Some Questions asked to my Friends –

1. What are Smart Pointer?
2. What starts first when computer is turned on?
3. Process state diagram with explanation?

6 were selected for Group Activity round, I was not one of them.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

## Interview Experience for Morgan Stanley By Wissen Infotech

I was gone through the Interview Process of Wissen Infotech for Morgan Stanley client.

### First Round :

3 programming Questions

- i) You are programmer of JDK development team. You have to override the `toString` Method of `Integer` class. In `Integer` class the value of `int` is passed through a variable called `data`. Please remember that `valueOf` function internally call `toString` method `Integer` class.

```
public String toString()
{
    // Write your code
}
```

- ii) Maximum Profit By selling once the share

<http://www.geeksforgeeks.org/maximum-difference-between-two-elements/>

- iii) There are Two methods one for inserting the data in database and other for fetching the data from database.

- a) `persist()` - for inserting data.
- b) `get()` - for getting the data from DB

`persist()` function is taking time in inserting the data.

Write methods that will not allow the data to be fetched until data is inserted.

(Apply Producer Consumer Problem)

### Second Round (face to face)

1. Employee table given

`Emp_Id Employee_Name Manager_Id`

Write query for Printing `Employee_Name` reports to `Manager_Name`

2. How to implement ThreadPool.
3. What is difference between different type of Thread pools  
(FixedThreadPool, ScheduledThreadPool, CachedThreadPool..)
4. How ConcurrentHashMap Work.
5. Other Normal Java Question.
6. Suppose we created 5 Threads through FixedThreadPool(5) and assigned only 3 task to 3 threads. Will the other 2 Thread created in memory or not?
7. Difference between Concurrency and Parallelism.

#### **Third Round**

1. You have to design the database for Order taking system. Describe all the tables like Customer table, Order table, Item table their Primary key and Foreign key.

2 One Simple code for paint all pixel which comes in given boundary.

isFill(int i,int j)

Fill(int i,int j) given.

#### **Fourth Round by Client Morgan Stanley**

1. What is thread, how it is useful?
2. Implement Queue using stack?
3. There is a trade file having million records that have size 1 GB and you have 256 mb ram how would you process.
4. <http://www.geeksforgeeks.org/length-of-the-longest-substring-without-repeating-characters/>
5. How would you implement Connection Pool.
6. What is difference between Stored Proc and Query.
7. There is source and destination station having some mediator stations that have some value to reach from one station to other station . You have to calculate minimum value to reach source to destination.
8. red black tree.
9. Basic Java Questions.
10. You have to design Pizza factory class that have type veg and non veg type with different toppings.
11. Trie data structure Implementation

Nice Experience

Thanks GeeksForGeeks —No word are there to write for your contribution

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Morgan Stanley

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## **Morgan Stanley Interview | Set 19 (On-Campus)**

MORAGAN STANLEY visited our campus.

Selection procedure:

#### **Round 1: online test**

50 objectives (aptitude,ds,os,etc...)

2 coding question

1. Simple count the numbers in the given range which comprises of digits  
Only in set 1, 2,3,4,5
2. Standard DP problem: Coin change

After first round 24 shortlisted:

#### **Round 2: Tech Interview**

Project related questions, one question of validating an IP address,  
Top five occurring words in a file, gave a situation of hospital related dbms problem and  
said to make an ER diagram of it. One simple question of BST.

After second round 7 were selected.

#### **Round 3: Group activity**

As MORGAN STANLEY's legacy, gave LEGO BLOCKS and  
said to come up with an idea and you want to impress your investors  
with your idea so they will invest in your project idea.

Advice : Don't suppress anyone try to give new idea and actively participate.

**Round 4: HR**

Asked about my strength,weakness,values and gave situations so that i will contradict with my values.  
Advice Be yourself and ready with examples of ur strength ,values,weakness !!!  
Gave situations of selecting between two choices and why that choice and why not other.  
why MORGAN STANLEY..etc

**Round 5:**

Asked to design twitter.com gave some conditions and requirements  
But the interviewer was very helpfull and gave hints where i got stuck.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

### Morgan Stanley Interview | Set 18 (On-Campus)

**First Round: Apti + technical + coding (1hr 30mins)**

Multiple Choice Questions: 19 MCQs, consisting of some output questions, conceptual questions of DS, OS, also few aptitude and reasoning questions.

**Coding:**

- Given a positive integer N, print all integers between 1 and  $2^N$  such that there is no consecutive 1's in its Binary representation.  
Example –

**Input:** N=15  
**Output:** 1 2 4 5 8 9 10

- Given some time intervals (starting time and its time duration). Find the maximum number of meetings that can be attended. (Standard Activity Problem).

**Second Round: Technical interview (1hr 15mins)**

The interviewer asked me about my favorite subjects and I said Data Structures, Algorithms, OOPs and O.S. He then started with the interview part.

- Given an array of integers, find the Maximum Sum of contiguous increasing subarray in O(n). (Dp problem).

**Input:** 7 1 5 8 2 5 6  
**Output:** 14 (1+5+8)

- Given an N-ary tree, search a node in the tree and return the level of the node.

Output should be -1 if node isn't found in the tree.

- Check if loop exist in the singly linked list and remove it.

- Discussion on various Traditional Sorting techniques. Merge Sort vs Quick Sort.

Importance of pivot element in quick sort and discussion on various approaches of finding pivot element.

- Implement Random Number Generator algorithm. (Couldn't give any effective solution for this problem ?)

- Detailed discussion on Process and Thread. Difference between them.

Which one is faster, Process with one Thread or Process with Multiple Threads?

Real time example of Multithreaded and Single Threaded apps, and example in programming point of view too.

How to check number of running threads in Windows OS.

- C++: Given an Employee class, how to design the scenario that if User forgets to enter User Name, then Error should be occurred.

Then, restrict user to enter his date of birth only once, later if he tries to modify it, Error should be occurred.

Discussion on creating objects through new operator, Constructor.

- Discussion on Normalization and Denormalization. Disadvantages of Normalization.

- Approach to print all the elements at k distance from a given node in binary Tree.

**Third Round: HR interview (20-30mins)**

This round started with, Tell me about your past and family background.

Strength, Weakness and values. What makes you stand out from the Crowd?

Any things which makes you feel proud on yourself.

Work which you did in team, what was your role in it?

Being Team Leader, what innovative and unique things you did?

What are the things that you have learned from all your Managerial activities?

Any challenging situation in NIT which you faced and faced successfully and few more questions.

What do you want from Morgan Stanley, being the employer of it?

**Fourth Round: Group Activity**

As MORGAN STANLEY's legacy, gave Lego Block, Chart Papers and asked us to come up with an idea and to impress your investors with your idea so they will invest in your business idea.

#### **Fifth Round: Technical Round (1hr)**

Design the database for an online shopping website like Flipkart. He kept giving new constraints and his requirement in the whole designing phase. Gave some critical scenarios because of which Concepts like Mapping, Concurrency Control, Transaction, ACID property and Mutex/Semaphore came into the picture.

#### **Sixth Round: HR interview (30mins)**

Discussion on how was my whole interview experience and what are all the new things which I learnt today.

Detailed discussion on my Extra- Curricular Activities throughout the MCA.

What are the challenging things you did with the team and how you managed?

Detailed discussion on both projects and some questions based on the projects.

Why shall we hire you?

P.S.: At the end of each round, they asked me to ask anything. Always be ready to ask some impressive questions at the end, it does matter a lot.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Morgan Stanley

### **Morgan Stanley Interview | Set 17 (On-Campus)**

**Round 1: 1.5 hours**

=====

This was a preliminary round held on Hackerrank. It included 20 MCQs for 50 marks and 2 coding question for 75 marks each. We had 1.5 hours to solve all the questions.

The questions in this round were from a range of subjects – Data Structures, Computer Networks, OS and a few Quantitative Aptitude questions. Some of them were related to finding no of articulation points, scheduler vs dispatcher, class A,B... IP addresses, linkage, Interrupt handler, union compatible tables etc

These are the coding questions:

1) There is network of servers which are connected by bidirectional cables.

And we have to find the shortest path between two servers.

Input format:

First line: N (number of servers) E (number of cables) L (Latency of each cable, all cables are of same latency)

E lines each contain: S (source server) D (destination server) [there is a cable between server S to server D]

E+1 line: K (Number of test cases)

K lines each contain: S(source server) D(destination server)

Output format:

For each of the K test cases find the shortest path between S and D.

**Constraints :**

1

2) Given that the numbers can only contain digits 0,1,2,3,4,5 find Nth such number.

**Example input : 6**

**Output : 10**

After this round 25 people were shortlisted for Technical Round 1

=====

**Technical Round 1: (Round 1) (45-60 mins)**

=====

The interviewer was pretty convivial. He started off with asking me about myself and then technical questions followed.

Q.1 What are the technologies you have explored? What kind of problems you have solved with them? (since I mentioned I like exploring new stuff)

Q.2 He skimmed through my resume and noticed that I had mentioned many languages but not C++ & he inadvertently asked me "what are viables". I had absolutely no idea and he

Q.3 Find a missing element in a sorted array of numbers from 1...N (I have no idea why did he asked this :p)

Q.4 REST vs SOAP (as I had good web dev experience)

Q.4 Some basic OOPs concept and how they are actually implemented in Java ie how JVM does things at runtime (how runtime polymorphism actually works). I told him that I have

Q.5 You're given a dictionary of words, ex {'My','name','is','XYZ'] and also a sentence like XYZisMyname. You have to find whether this sentence is only made up of words from the

Q.6 This was a tough one as it had appeared in Fourth Round of many candidates' experience that I read on GfG. There is a big warehouse and there are many forklifts used to carry optimal paths for their destination. You have to design the algorithms, data structures(to keep track of coordinates, positions etc), classes etc. I put forth many approaches but he wasn't satisfied with anyone of them and kept on guiding me to finally arrive on a decent enough solution.

Q.7 Why Morgan Stanley? I gave him a staid and banal answer to which he facetiously replied that it wasn't at all honest :p

For a first round, it was pretty tough one as I didn't get few questions but I think it was my approach and strong grasp on basics that made the difference.

After this 8 people were selected for the next round.

=====

#### Group Activity: (Round 2) (30-45 mins)

=====

We were divided into two groups and were handed out a chart paper, lego blocks, clay. We were given 30 mins and had to come up with a startup idea and its key features, business model, logo, name, funding plan etc. Then midway through the round we were asked to abandon our idea and pick a new one. So it was a pretty grilling and intensive round.

=====

#### Technical Round 2: (Round 3) (60-80 mins)

=====

I shall say this was my best and worst round. Almost every interviewer had a speciality and this one had OS. He asked me to introduce myself and then asked me what my favorite subject is. I mentioned "OS and DS" and this put a big smile on his face :)

Q.1 What is paging, page table, virtual memory, why it is needed, what can be the maximum size of page table and the virtual address space.

Q.2 What are other things in OS that I like, I told him IPC, Threads etc and the next question followed.

Q.3 This was a fantastic question and the way he built it - layer by layer was amazing! He asked me about browsers(which one you use and why?) and the difference between them. was looking for an answer from OS perspective. So I told him how mozilla is very fast and how pathetic chrome becomes after opening few tabs. Then he asked me about the reasons. After getting a little guidance, I told him how mozilla uses threads and chrome uses processes for every new tab that you open and then he asked me how chrome shares cookies across tabs and that's when questions on IPC followed. I was then asked about synchronization etc.

Q.4 Design a "playlist" feature (with all the classes and data structures) and how I would implement it and which Data Structures I'd use.

He asked me to implement a "Shuffle" feature also, where every "next song" is played randomly and you can also travel back and forth in the list(previous and next)

Precisely you should be able to -

- (1) create a playlist
- (2) add a song
- (3) delete a song
- (4) shuffle
- (5) play previous or next song

Q.5 You have to design a football game where in teams, players etc will be the classes and he asked me to list down all the entities involved and mention their attributes. I told him how I'll create various classes and defined inheritance among them (like player->mid, def, attacker etc). Just when it seemed easy, he told me how I'd design algorithm to pass the ball, score goal etc. So I told him how I'll rate players based on their roles and how their skills will decide their movements, passes, shots. How we can create a graph to find paths between players to ultimately reach the goal and how opponents can be given high weights on the edges to favor a long pass instead of short one with many opponents, how their ability will determine the feasibility of doing something. The entire thing was fun and I wish we had more time to discuss

I'd say I answered only 80% of the questions but I showed him that I was very well verse with concepts. Be confident, it's not necessary to answer all the questions

but very important to think & iteratively improve your approach.

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#### Professional Fitness Round/Tech+HR: (Round 4) (45-60 mins)

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This was a mix of HR **and** tech. I was basically asked the same old question "Why Morgan?", but **this** time I gave him a very genuine answer **and** questions followed:

Q.1 Why Morgan?

Q.2 One instance **where** you helped people? (since I had mentioned it)

Q.3 Family, background etc

Q.4 What is AJAX **and** how would you use it with NodeJS (Since I had worked on NodeJS in my previous intern).

Q.5 Implement a system **where** in you have to display stock prices **in** real time. I told him how I'd design my front end and backend. I mentioned two approaches-a long polling method and another using sockets. I told him how I'd maintain different versions of the stock table **and** how the second approach will be beneficial. This is where my intern helped as I had to build scalable backend to maintain millions of open connections **and** use session-reuse etc. I gave him a rough architecture **and** explained its working **and** he seemed quite impressed.

Q.6 What are my plans for higher studies?

Q.7 X = abcd, Y = a\*b\*c\*d ( has to be 4 digit no)

Find a,b,c,d such that X+Y is minimum.

I fumbled a lot as I was very tired but he guided me very generously

---

#### HR Round: (Round 5) (15-20 mins)

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Q.1 Why Morgan? Why only Morgan and why not X,Y,Z?

Q.2 What do you dont like? How you deal with it?

Q.3 Do you plan to do MS?

Q.4 Any questions? - Yes, definitely :p

#### TIPS:

1. Morgan Stanley interviews are way different than others. Not only you have to be a good coder, but you also need good communication skills, body language **and** confidence.
2. OS, CN, DBMS **and** DS are very very important! To make it through this grueling 5 Round process, you need to have good understanding of them.
3. Talk about your projects as much as you can, time spent on talking about projects saves you from some questions which you may not like!
4. Be loud **and** clear about your favorite subjects. Its highly probable you'll be asked questions on them.
5. Ask for help whenever you're stuck on something. These folks are very friendly **and** they'll happily guide you till CERTAIN POINT.
6. As you can see, a lots of problems involved picking up right data structures, algos to solve real life problems. It only comes with practice and experience 😊
6. Keep coding and do MCQs from Gfg

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## GATE CS Corner

### Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

## Morgan Stanley Interview | Set 16 (On-Campus)

**First round** of the process was online test:

Total 19 questions on Hackerrank platform:

(i) 17 MCQ based on mostly basic data structures and algorithms, few on numerical ability, few on verbal reasoning

(ii) 2 Coding questions

Total 24 students were selected for interview process.

First interview was technical round:

In this round, all the candidates were asked about various topics to check fundamentals of computer engineering.

Some of my interview questions:

1) Difference between calloc and malloc with example of application,

2) Given list of students with their names and marks, which sorting algorithm and data structure is preferable for sorting marks in descending order.

3) Grep command in Linux and its applications

4) Design a database given following details: A company like Morgan Stanley has got many clients like HDFC, and other companies. Each client company has got many employees. We need to design database to search efficiently the following details:

-> Print number of representatives for each company along with details of the company (like client ID, and some other usual details) using sql query

My solutions:

1) Malloc just allocates memory and calloc also initializes it.

2) I designed it with structure(in C++) and wrote code for quicksort. Then I was asked about the reason and time complexity for that along with details of random pivot.

3) Explained basic features of "grep" along with examples

4) Two tables: (i) Clients(ClientID, ClientName, ClientDetail) and (ii) Representatives(ID, Name, ClientID), followed by SQL query to get details using inner join. Then I was asked about the reason to choose inner join and not outer join. I gave reason that, there won't be any client without representative and no representative without company.

Interview process for some of my peers also includes the topics like : database design, sorting, data structures for various applications like social media website, immutability in JAVA, OOP concepts like virtual functions and destructors, inheritance, etc.

Then 9 candidates were selected for next round.

#### Group Activity:

We were divided into two groups of 4 and 5. We were provided two blank sheets, clay, lego toys. We were supposed to represent one startup idea and build prototype for it. Design logo, name, and key features and related stuff. Every member has to participate in presentation. We were given total of 30 minutes followed by some questions like whom will choose as a team leader. Team leader was asked to choose the one whom he will remove from the team and whom he will take from other team with reason.

Then it was followed by 3 round of interview.

#### Interview 1(HR + puzzles):

Typical HR questions like introduction, why Morgan Stanley, Why should we hire you, strength, weaknesses, etc.

Then one HR question:

Interviewer: Let's say both of us are assigned a task to complete in sync and submit it within time limit to our boss. One of your close friend informs you that I have told boss that you are not working very hard but there won't be any delay in work since I'll complete it with hard work. What would be your reaction ?

#### Interview 2(Technical):

1) URL shortening algorithm for customized URL and random URL service like tinyurl.com provides and some questions related to hashing for string as I described hashing for URL shortening.

2) Data structure for snake & ladder game followed by code for finding minimum number of dice rolling required to reach the finish of the game from starting location.

3) OS concepts of virtual memory and its applications. Algorithms for LRU and LFU techniques.

#### Interview 3(HR):

Normal HR questions followed by hobbies and sports I like, places I visited, games I play, etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

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### Morgan Stanley Interview | Set 15 (On-Campus)

Recently Morgan Stanley visited our Campus for recruitment. Here's my experience.

#### Round 1 (Aptitude):

19 MCQ on CS concepts.

2 easy coding questions

Find maximum contiguous sub array sum in a given array.

Given an array find the sum of elements between the given range.

In both the questions the test cases were very easy and also time limit was also not strict.

#### Round 2 (F2F):

One on One interview were help the next day. I waited for about 3 hrs for my turn.

The following questions were asked to me:

Parse floating point numbers from a stream of input.

How would you implement the Tabs system of chrome where closing one tab will automatically take you to the previously modified one.

CS concepts like Virtual Memory and Paging etc.

Data structures to implement LRU and LFU caches.

Asked me about my language of choice- I said C++.

Then he discussed Virtual Functions in C++. How to implement them and why they are required.

I was rejected after the interview and only 9 students were shortlisted.

#### Tips;

Stay calm and focused.

Try to understand the question correctly and represent your thought process.

Approach as you would do in a real life scenario.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

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### Morgan Stanley Interview | Set 13 (On-Campus)

I gave the Morgan Stanley aptitude test, here's my experience.

So here's how it went.

The test was for 200 marks 90 min duration without any breaks and you can attempt any sections in any order. The test was conducted on hackerrank.com.

50 marks algorithms, data structures and logical reasoning mcqs. There were 20 mcqs.

The logical reasoning mcqs were based on proving if a statement is correct and deriving relations.

The data structure mcqs consisted of graphs and trees. Questions were like given n leaves and m internal nodes what is the height of the tree, one on full binary tree height, BFS output for a given graph.

In Algorithms, we were mostly asked about time complexity .

Now for the coding section there were two questions.

1. Given a pseudo random string of length 26 with characters from a to z such that the indices are represented as 00, 01, ... 26. And another string E which contains an encoded string based on the above indices like 000723... Derive the decoded string from the two. The constraint on E is that it could range till  $10^8$ .

2. I don't recall the exact question but here's how it goes. Given a input such as

I/P

5

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

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# Morgan Stanley Interview | Set 12 (On-Campus for Technology Analyst)

Morgan Stanley recently visited our campus for its full time Technology Analyst position and Summer Analyst (Intern) position. I applied for full time.

There were 5 rounds in all.

1. **WRITTEN ROUND** : There were basically 2 parts : Aptitude and Coding.

**Aptitude Part** : There were 30 questions to be completed in 45 minutes. There were 10 aptitude questions which were quite time-taking. Questions were from Data Interpretation as well. Then we had to choose a section out of C/C++/JAVA and the rest 20 questions were from your chosen section. The chosen section was also time-consuming.

**Coding Test** : There were 3 questions to be completed in 1 hour. Program 1 was to find the required element of Pascal's triangle. Program 2 was to count all the palindromic substrings in a string. I am sorry but I do not remember Program 3.

2. **TECHNICAL INTERVIEW 1** : It lasted for around 30-35 minutes. Questions were on array, hash map, file handling and string theory. All questions were generally algorithmic in nature.

3. **HR INTERVIEW** : It lasted for around 50-55 minutes. We were basically grilled in this interview.

4. **TECHNICAL INTERVIEW 2** : It lasted for around 1 hour. In this round, there were questions based on real-life scenario like designing a shopping cart for an e-commerce website etc. Then there were algorithmic questions on queue, graph and trees. A problem was given and I was asked to reason out the best data structure to solve that problem. There were simple problems on linked list.

5. **GROUP TASK ROUND** : It was an entertaining round but was quite pressurising. We were divided into groups and asked to make something with LEGO Blocks that they had provided. There is a time-constraint in this round. We had to explain all the design aspects of our construction like name, choice of colour, significance of buildings, structure strength etc.

Finally after 5 rounds of interviews, I got selected. I thank my parents, friends and my seniors. Of course, geeksforgeeks is not to be left behind!!!!!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

# Morgan Stanley Interview Experience | Set 11B (On-Campus)

Recently, Morgan Stanley visited our campus for the written exam for December placements. Here are the questions for the written round.

3 questions coding + 30 objective

Total Time – 1:30 hr

**Objective Ques** were simple – C/C++ prog, , input/output, logical ques.

**Coding Ques** —

1. Given an array and a number k. Find number of pairs in the array having sum equal to k.

2. Given a number N. We can divide the number into N/2,N/3 and N/4 at a time rounding all these to integer value. Now you can repeat above procedure for newly generated numbers.

Get the maximum number that you can generate from a given number.

Example – Given Number = 12

12 → 6 + 4 + 3

6 → 3 + 2 + 1

4 → 2 + 1 + 1

3 → 1 + 1 + 0

So max number generated = 13 (6+4+3).

3. Various dates are given to us in a specific format. Find the least date among them.

example – Given-

13 Jan 2014

24 Dec 1994

08 Feb 2000

Ans – 24 Dec 1994

Hope this will help you all.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

# Morgan Stanley Interview | Set 11 (On-Campus)

**Multiple Choice Questions** Questions ranging from give the output of following C program to some theoretical concepts of OS etc.

#### Coding

1. Give maximum subarray product in a given input array which can contain integers (including negative and zero).
2. Given a set of n coins of some denominations (may be repeating, in random order), and a number k. A game is being played by a single player in following manner: Player can choose to pick 0 to k coins contiguously but will have to leave one next coin from picking. In this manner give the highest sum of coins he/she can collect.
3. A file of encoded message contains only numbers. Original message contains only lowercase letters and spaces. So character 'a' is mapped to 1 'b' to 2 and so on till 'z' is mapped to 26. Given an input of numbers find out the number of ways you can decode it in original message. Eg. 123 can be decoded in 3 ways as 'abc', 'lc' or 'aw'

#### Technical Round I

Description of projects. Seeing Java projects in my profile they continued to ask my questions from Java. Given a string of characters how will you print each word in reverse order. Eg. "Information Technology" you have to print "noitamrofnl ygolonhceT". Interviewers were very supportive and will guide you in the process.

Then explain how Hashmap data structure is implemented and code it. What is hashing and its benefits. Suppose a class is defined as follows:

```
class MyClass{  
    public String name;  
    public List phonenos;  
}
```

How will you make the class immutable. Please pay attention to the List it is important.

Then asked me about what is AJAX.

After this round 11 people were shortlisted

#### Group Activity

We were divided in four teams and were given LEGO blocks. We were asked to build a model of product which address high volume of clients and ensure it has following characteristics:

1. Strength
2. Sustainability
3. Aesthetic value.
- 4.

Time limit 40 minutes.

After about 10 minutes we were asked to merge with another team. Then we had to make model together. After that we had to present what we made in front of whole panel.

I just want to make a remark on this round: Guys do not pay attention is actually building anything. Process of how you come up with idea, interact with others, how much you push your idea and can you accept your mistake is important. It was a very nice experience.

PLEASE NOTE: UNLIKE GROUP DISCUSSION THIS IS A CONSTRUCTIVE EXERCISE. Work together and be creative.

#### Technical Round II

Design a Parking Management System.

A puzzle: two dice are given. each has six face. Change the numbering on one dice only so that the probability of occurrence of sum (of the numbers appearing in a throw of two dice) from 1 to 12, are all equal. So normally probability of occurrence of sum 2 is 1/36, of sum 3 is 2/36 etc. You have to change numbering in such a way that probability of sum 1 = P(2)=....=P(12).

#### HR Round

I liked this round because it was very calm and went very smoothly.

They asked me to walk them through the resume. Good experiences of my last job which will be with me throughout my life. Some things you wish previous company could have improved on. Good and bad things of my experience in current college. What made me to go for higher studies and at last why Morgan Stanley.

Then they asked if I had any questions: I asked: are formals necessary?

One interviewer explained very nicely how the company works for banks and the structure. He said company is very informal in field of technology but very formal in terms of attire. Other interviewer said Every fourth Friday of month you can wear casual if you want.

I had a great experience interviewing with Morgan Stanley and wish best of luck for my fellow geeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

## Morgan Stanley Interview | Set 10 (On-Campus)

**First Round:: apti + technical + coding (1hr 45mins)**

**1) Multiple choice questions round : (45mins)**

It consists of 2 sections. One was aptitude (10 ques). Level of difficulty was difficult. I was able to solve only 3 questions.

Other was technical (20 ques). Level of difficulty was moderate. I did 15 questions.

**2) Coding round : (1 hr)**

1. There are N stops and each stop had a gas station. You need to travel from stop 1 to Nth stop such that you should make minimum number of stops. Constraints:

Your car has a capacity of M units to travel and you can fill only M units in your car from any gas station.

Input: N and M where N is the number of stops and each stop value is the distance from the source stop. e.g: 0 1 3 5 7 8 (so it was in increasing order). M is the capacity of the fuel tank. (8 marks)

2. Given a month and a year. You need to find the date of first Monday of given month and year. (12 marks)

3. Given an n X m matrix 'M' of alphabets and a string 'S'. You need to find the starting index of 'S' in 'M'. The string can be found horizontally or vertically. (Alphabets are case insensitive). (10 marks)

eg: 4 X 5 matrix

```
a b F D k  
s R I o j  
A p e g k  
o s A y n  
String S : dog Output: 0,3
```

I was able to solve only 2nd question completely and tried 3rd one (but it was giving wrong answer).

After this round 18 students were shortlisted.

#### **Second Round :: Technical interview (45mins)**

He asked me about my C++ project then some OOPs concepts like polymorphism, function overloading and overriding, type casting, virtual function, vtable and vptr and some more questions related to virtual functions.

OS: Paging, process and thread, thread synchronization, semaphore, paging algorithms.

DS: Why we use linked list. Given a linked list, print the elements of linked list in reverse order. I solved it through recursion, then he asked me to use iterative method without using extra space and in one traverse. Lowest common ancestor of 2 given nodes of BST, and some more.

Puzzle: There are 5 switches in a room and there are 5 bulbs (not in that room but on different floors). Find the minimum number of trips you will make to find which switch is associated to which bulb.

After this round 7 people were shortlisted.

#### **Third Round :: Group Activity (50mins)**

We were divided into two groups of 3 and 4. There were some papers with the instructions for each group and two boxes of LEGO blocks. We had to build up a functional unit for Morgan Stanley for which we were given 40mins. Then in the next 10mins we had to present our prototype. It includes Logo, benefits, and some other factors which we had to consider in our prototype.

In between another letter came from Board of Directors and we (both groups) had to merge and build the prototype together now. So we had to come up with something that includes both the groups' ideas.

All the panel members were standing around us to judge us throughout the activity. And we were judged on the basis of our team work, how well we can communicate with other team members, our planning, our execution, and many such factors. Throughout the discussion we had to discuss loudly so that the judges could hear our thought process.

At the end there was a session in which all the judges asked us questions about our approach, our individual contribution, what we thought of other members during the whole activity and all. This round was very interesting for me.

#### **Fourth Round :: HR interview (45-50mins)**

Started with my intro. Then he asked me about my another project which I made in VB.net. Then he asked me many questions, I remember now some of them like given some revenue and some technologies, how would you solve any particular issue in your home town using that. Asked about my achievements, any moment in my life which made me feel proud, what all things I have learnt and brought a change in me after coming to this college. How do you react to the situation when you are given a deadline for some work which is important but not able to meet that deadline. He asked about my hobbies and many more things.

#### **Fifth Round :: Technical interview (almost 1hr)**

This was the last round. Again he started with my project. And then came to some technical stuff:

1) What data structure will you use to find the unique words and the number of times the word appear in a novel. Then he kept on asking more questions related to this like print a word which is appearing maximum number of times. Print 10 words which are appearing maximum number of times. And many more.

2) Given a binary tree and a number n, find the root to leaf branch whose sum equals to n.

Now find maximum length branch whose sum equals to n (that means ofcourse now there are more than 1 branch whose sum equals to n)

3) Design the database for an online shopping website like flipkart. Now how will you modify your database if you want to give some discount on those product which are going to expire after 6 months. And many questions like these.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Morgan Stanley

## **Morgan Stanley Interview | Set 9 (On-Campus for Internship)**

**1st round- written test 30 objective questions along with 3 coding questions.**

Time allotted 90 Min. It consists of 3 sections:

1. First section had logical and mathematical aptitude questions. A total of 10 questions.

2. This was language dependent section. You were allowed to choose any of C/C++/JAVA language and there were 30 questions in this section. The level of difficulty was moderate.

3. Third section consist of 3 coding questions which were as follows:

Q-1 Check whether the given strings are anagram of each other. Space has to be neglected.

Q-2 Three vertices of a triangle were given along with one more point. We have to check whether a given point lies inside a triangle or not.

Q-3 Given three strings A, B and C. Write a function that checks whether C is an interleaving of A and B. C is said to be interleaving of A and B, if it contains all

characters of A and B and order of all characters in individual strings is preserved.

Questions were not so difficult but have to be attempted in 90 minutes.

Shortlisted 8/61 students for second round.

#### **2nd round – Technical questions, Coding questions and HR round all together**

Introduce yourself.

Share some nice experiences in college.

Technical Questions

1. Given an array with base address 4000 and the size of array is arr[20][20]. Determine the address of index arr[3][4].
2. Function prototype of printf.
3. How malloc is used and where it is used. Also tell the return type of malloc and why you need to type cast the return type of malloc. Explain it with an example?
4. If we will take a void\*p and int\*q and we write q=p. Then what will be the output in C and C++.
5. In which conditions your copy constructor is called. Mention all the possible condition.
6. What is the difference between early binding and late binding.
7. Asked a question on the concept of object slicing.
8. Asked a question on the concept of late binding.
9. What is VPTR and V-Table. Where V-Table is actually present and whether it is different for each class or shared among all the classes. And where the VPTR resides ?
10. The size of class will increase on using a virtual pointer. If yes, explain the reason behind it.
11. Pure virtual function and its implementation with the help of example.

Now switched to some Coding Questions

Q-1 You have a linked list having data, next pointer and random pointer. The data may contain the repeating values. Now to store the whole information in any new data structure except linked list and return that structure so that the other user can make the same linked list with the help of data in new data structure used.

let suppose the linked list is

2 -> 3 -> -3 -> 4 -> 5 -> -3

Now random pointer of 2 is pointing to first -3 and random pointer of 3 is pointing to second -3 and so on...

Q-2 Segregate R,G,B flag in O(n) and using one variable.

For eg:- R R G B R R B G G R

Output should be: R R R R R G G G B B

Q-3 With the help of which data structure you can implement a parking system for different category of wheeler(2 wheeler , 4 wheeler, 6 wheeler).

At last

Why you want to join Morgan Stanley ?

Total duration of the interview round was about 1 and a half hour..

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## **GATE CS Corner Company Wise Coding Practice**

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## **Morgan Stanley Interview | Set 8 (On-Campus)**

Recently Morgan Stanley visited in our campus for FTA(Full time analyst) and intern programs.

#### **Written Test**

It was the technical + aptitude test that anyone of us ever faced. 10 aptitude questions and there was a choice for technical part. We could choose among the three languages, C, C++ and Java. There were 20 technical questions. Total 30 ques. within 45 min. There was sectional cut off. I attempted 3 from aptitude section and 7 from languages(I chose C language).

Then there was a coding round immediately after that which comprised of 3 ques. in 1 hr.

- a) Determining the range of a URL from many given ranges which fits the input URL.
- b) Huffman Coding.
- c) Determining the day of any date.

I was able to do only the last question completely and gave a try to Huffman one.

#### **First Tech Interview**

Held immediately after the presentation. The interviewer asked me to introduce myself informally and made me feel extremely relaxed. Then he asked me about my achievements and was writing it on a sheet of paper as I dictated. Then he asked me about my favorite subject and I said Data Structures. He then started with the interview part.

- a) Middle of a link list.
- b) Queue using Stack. I gave the general algo and then he asked me to optimize it by making the retrieval time constant. I tried but I wasn't able to come with something fruitful.
- c) Deleting alternate elements in a link list.
- d) Sorting algorithms. Almost all the sorts I knew I mentioned but he did not dig deep into sorting stuff.
- e) Given an array with duplicate elements, output the array without the duplicates as well as sorted. I gave him Brute force approach to it and then he asked me to optimize it but I could not. He gave me a hint and then I suggested building BST(excluding the duplicates when encountered) and then inorder traversal of it.

f) External sorting question and optimizing it.

Throughout the interview he was noting down something or the other. There were many many sheets with different headers, on which he was writing down something. The results came late night and they selected 8 people for the next round.

#### **Group Activity**

We were divided into two groups of 4. There was sheet of paper with the instructions for each group and two boxes of LEGO blocks. The round was conducted in a board room and all the panel members were sitting around us to judge us throughout the activity.

We had to build up a functional unit for Morgan Stanley, and we were judged on the basis of our thought process, our approach, our goal, our planning, our execution, our team handling, and many many such factors. Throughout the discussion we had to discuss loudly so that the judges could hear our thought process.

There was a twist in between when another letter came from BOD and we(both groups) had to merge and build the prototype together now. So we now had less time and we had to come up with something that includes both the groups' ideas.

In all we were given 40 min.

After that we had to present our prototype. There was a session of 30 min during which a panel of 10-12 judges asked us questions about our approach, our team spirit, what we thought of other members and all. It was something extremely new that we ever face in our lives.

#### **Second Tech Interview**

Held after the group activity. The interviewer was much more gentler than the previous one and made me feel very comfortable. Started with informal talks and then came to the real stuff.

- a) Diameter or width of a binary tree(only the approach).
- b) How to store 2D array in a database.
- c) How to store N-dimensional array in a database. I gave sequence solution.
- d) How to store N multidimensional arrays in one table.
- e) How to search a record by its name field when there are billions of records.

The whole interview lasted for 40-45 min.

#### **HR Interview:**

It was two on one, started with casual talks and then proceeded towards the business end of the Morgan Stanley's HR Interview. It was intense, and when i say intense then literally i mean it. They asked me 100+ questions on different situations and scenarios that a employee faces. I don't remember a lot but most of them were manager related. I answered something then completely changed the situation and came up with something more challenging.

They wanted to check what kind of a person you are? How you look at things? What your take on different situations? and stuff like that. You should just be yourself and please don't try to say something that you don't believe in because they were digging deep. They were very very polite and extremely supportive in a sense that they were listening to my responses keenly. In the end, they asked me to ask anything and i came up with few general questions such as work environment in the company, how you like it, etc.

My only suggestion to all job aspirants is to focus on what you like and then look for it on Geeksforgeeks.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Morgan Stanley

## **Stanley Interview | Set 7 (On-Campus)**

Recently Morgan Stanley visited our campus for jobs and interns. I had applied for the position of an intern and there were two rounds for us :

#### **Round 1 : Online Written Test – 90 mins**

##### **Part 1: Aptitude and Language proficiency : 45 mins**

It consisted of 10 questions on general aptitude . They were fairly easy but time consuming. After attempting these 10 questions, we were asked to choose any language of our choice – C, C++ or JAVA and based on the selection, there were 20 questions based on that language. For C, most of the questions were to predict the outputs. There was +1 for each correct answer and -0.25 for each wrong answer for all the 30 questions of both sections.

##### **Part 2: Coding: 45 mins**

There were 3 coding questions.

1. You have to generate an even number which is just larger than the given input number and using the same digits of the given number.
2. Consider  $2 = +1-2+3$ ,  $4 = -1+2+3$ . Any integer can be represented in this manner. For an input integer, print the number of terms needed to generate that number. For eg. it is 3 for 2 as well as for 4 in above examples.
3. Given an 2D matrix and an angle (multiple of 90 degrees), print the matrix after rotating it by that angle.

There are sectional cut-offs for each section( aptitude, language proficiency and coding), so do attempt sufficient number of questions from each section.

#### **Round 2 : Personal Interviews:**

Personal interviews consist of two sections – technical interview and HR interview.

For the technical interview, a mixture of questions were asked based on arrays, linked lists, trees and hash maps.

Cant remember any specific one but were fairly easy.

For the HR interview, normal personal questions such as tell me about yourself, why Morgan Stanley , etc, were asked.

TIP: Score good in coding round and technical interview to grab the opportunity. BEST OF LUCK.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Morgan Stanley

### Morgan Stanley Interview | Set 4

#### Written Test:

10 Aptitude  
30 Programming  
10 CS Fundamentals

There's negative marking, plus there's sectional cutoff, so you have to be very careful, and risky at the same time.

#### Written Test 2:

Programming round, 4 questions in 45 minutes

1. Get an array B such that  $B[i]$  has the product of all numbers of A except  $A[i]$

The solution is simple using left and right array

2. Spiral level order traversal
3. Longest Common Substring
4. Add two linked lists

22 people were shortlisted out of 97.

#### Technical Interview 1 :

The interviewer discussed the codes I wrote.

And some additional questions like queue using two stacks , complexity of BFS, worst case complexity of quick sort and when does the worst case occur.

One SQL query.

Out of 22, 10 were shortlisted.

After this, there was no elimination till the end.

#### Group Activity :

This can be the make or break round, as Morgan Stanley is all about personality and communication skills. In my case, we were divided into two groups of 5 and were given 10 11 pictures and were asked to link them and create a story. Your creativity matters here. Advice : Don't stay quiet, but talk sensibly.

#### Technical Interview 2:

1. Design a online e-commerce website like Amazon, Flipkart.

This question requires attention to detail.

2. Given an expression  $5*3+10/2$  , write a function to evaluate the expression. My solution was to make a tree and traverse in postorder.

#### Technical + HR :

The guy was the seniormost among the 8 recruiters.

He talked about my projects, what difficulties I faced, what can I improve more.

One question was..I was given data about students who had taken some subjects.

I had to make a data structure such that if I query for no of students in a subject or no of subjects a student has taken, the complexity should be less.

Rest was HR.

Finally, after 3 hours of discussion between the recruiters, I was selected

A big thanks to GeeksforGeeks. This had been my bible for the summer.

One advice: Please don't mug up the questions from this website. Solve them on your own. It's the problem solving ability which is being tested, not your memory.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Morgan Stanley

### Morgan Stanley Interview | Set 3

Morgan Stanley interview experience

#### 1st round: (90 minutes)

It was multiple choice questions round. It consists of 3 sections:

1. This section had computer fundamental questions which were easy. It had 10 questions.
2. This was language dependent section. You were allowed to choose any of C/C++/JAVA language and there were 30 questions in this section. The level of difficulty was moderate.
3. Last section had logical and mathematical aptitude questions. A total of 10 questions.

So in total this round had 50 questions.

#### 2nd round: (45 minutes)

This round had 4 questions for which we were supposed to write code on paper. Only 45 minutes were given for this round. It was not an elimination round but it was an important one. Questions were:

1. Exchange kth node from start and kth node from end of a singly linked list.

Example: if the linked list is

5->10->25->45->31->16->23->51 and k=3

Then linked list should be converted to

5->10->16->45->31->25->23->51

Boundary cases had to be handled properly.

2. Given a number, you have to find next greater number which has same set of digits.

Example:

If given number is 4765 the output should be 5467.

3. Given a binary tree, you have to print level order traversal of the tree (left child then right child) but every next level has to be printed in next line.

Example:

If the given tree is

```
5
10 15
56 47 12 42
```

Then the output should be

```
5
10 15
56 47 12 42
```

4. You are given a sentence you have to reverse it word by word.

Example:

Input:

this is morganstanley interview question

Output:

question interview stanleymorgan is this

Although the questions were not too difficult but due to the time constraints you have to check boundary cases and comments your code properly.

#### 3rd round: (45 minutes- 1 hour)

This round was a technical interview as well as an elimination round. First of all he asked me about my recent projects and he asked me to tell in detail about my last project. I made him understand everything and discussed about several aspects about it. Then again he asked me if I have done any OOPs project. Since I had one so I told him about that and explained him the OOPs concepts used in that.

Then he moved on and asked me about my approach for 2nd question of coding round which I told him and after that I was told to write end to end code for that which I did. Again he asked me to write code for the last problem of coding round and approach too.

After that he moved on and came to OOPs. The questions were based upon virtual functions, function overloading, function overriding, inheritance, abstract class etc.

#### 4th round: (30 minutes)

This was a group task. We were 5 in a group and the panel had 5 persons as well. They had some 10 images with them; they distributed 5 out of them to us and then kept rest of 5 images on the desk. We were supposed to make assumptions about the picture given to us and the time given was 2 minutes, then they told us to come up with a story as a group, whose theme is business ethics, including those 5 pictures as well in 15 minutes. Basically they were checking your communication skills, body language and team work. Then before those 15 minutes were over he included some more 5 pictures into that and told us to make story now.

Then we were asked to tell about our contribution in the story.

#### 5th round: (1.5 hours)

It was again a technical interview although it was very late in night I had a long interview. Again he started with my project, he took around 30 minutes with project related queries and he asked me several things future scopes, modifications etc. then he moved on with an algorithm question:

There is an array of ordered pairs (value, color) with sorted by value. You have to sort it based on color but relative order of values shouldn't be changed. I gave him a solution for that, then he modified the question that now the value part is not sorted and you have to sort it based on color first and then for same color based upon value. I gave him solution with array of linked list then he asked me about time complexity and all. He asked about sorting technique, why merge sort not quick sort. How can we make quick sort better. How to find median of an unsorted set of values, I told him about selection algorithm and about its time complexity as well.

Again he asked me an algorithm question:

You are given some processes with burst time and some fixed memory. You have to accommodate as much process in memory as possible.

Example:

```
1 4
2 3
3 2
4 10
5 5
```

And fixed memory is 10

So I gave him answer with greedy approach, which includes 2,3,4 but he told me you can have 2,3,5 which will not waste memory at all. Then I came up with solution using knapsack algorithm. He was satisfied with that.

Afterwards he asked me some questions like

Suppose you are given a printer which has very less memory let say memory that can accommodate only 1mb at a time and you want to print a file with 100 pages each size 1mb how you will manage that. Then he extended the problem like if the printer is connected to a network and from each system if I give command to print 100 files how you will handle that. Spooling is done on printer side or system side. And he kept on extending the problem in different dimensions. Again he asked

suppose we want to print only one file like poster which is very large say 500mb how you will handle these type of situation.  
So this was most interesting and lengthy round of all and it was over in night around 11:30.

#### Round 6: (HR round 15 minutes)

Last round was an HR round which was not long for me but for others it was long too.  
He asked me where are from and will you have some problem in reallocating.  
What did you learn coming to this college and what did you learn from your projects?  
Then he asked me if I want to ask him something. I asked him some doubts and that's all.  
By the end of this it was already 12:30 in night. They told us to wait for results and we waited till night 2:30 but they couldn't come to a conclusion.  
So next day morning they announced the result and I was one of four whom they hired from my college.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Morgan Stanley

## Morgan Stanley Interview | Set 2

### Written Test:

10 aptitude and data interpretation questions, questions based on language of ur choice(C/C++/Java), questions on basic Computer skills.

I was able to do only 2-3 out of 10 apti questions...and almost all C questions and Computer skills questions.

Some questions:

Apti:

- 1) A person need to weigh 5 balls (weight30).So the person weigh two balls together (ie. Weigh all possible pairs)..the values of weight of all possible pairs were given and we need to find the lightest ball
- 2) Given 3 boxes with A having 2 white balls 3 blue balls, B having 1 white 4 blue and C having 4 white 1 blue. Find out the probability of picking 2 white and 1 blue if one ball is picked from each box
- 3) In how many ways can 4 balls be distributed in 3 distinct boxes when each box may have any number of balls. Also, 2 balls are identical
- 4) A simpler version of Einstein puzzle
- 5) Data Interpretation Questions –given two graphs interpret data.

C /Computer Skills:

All questions were easy. Mostly output based

- 1) printf("%d",sizeof(""));
- 2) Question on hashing and quadratic probing
- 3) Question on binary tree
- 4) Given base address of array, find array[5][6]
- 5) Question on number of comparisons in binary search
- 6) Questions on size of union /structure and there memory layout

Shortlisted 21 out of 256 students

### Coding Round:

We had to write 4 codes on paper in 45 mins:

- 1) Given a dictionary, find all the words which are anagram of each other
  - 2) Given a sorted array and a number 'c' . find pair of numbers such that a+b=c
  - 3) Given a sorted array .remove duplicates from it
  - 4) Given a binary tree T1 with millions of node and another binary tree T2 with hundred of nodes.Find if T2 is subtree of T1.
- questions were easy, but time was less

### Tech Interview:

- 1) which platforms u use?
- 2) tell some commands of linux
- 3) how to kill process
- 4) how to send some specific signal to a process using kill
- 5) how to see process created by specific user
- 6) how to check memory utilization of all set of process
- 7) how to check CPU utilization of processes(which is consuming highest)
- 8) questions about my Intern project
- 9) what u have done in android?
- 10)

```
while(1)
{
    void * a = malloc(1024*1024);
}
```

How many times this loop will run on a 2 gb ram and a 8 gb ram.

- 11) how 4gb process can run on 2 gb ram
- 12) why we use 8 gb ram if we can manage with 2 gb ram
- 13) given n servers and a scheduler which take messages and send it to one of n servers.

Also given the percentage in which the messages should be distributed among servers for load balancing. Give a algorithm on how will u decide the destination server of

a message which has just arrived.

14) What functions are there in class automatically..write copy constructor signature. Why reference is used as argument.

15) At last I asked him about Glass-Steagall Act which lead to birth of Morgan Stanley. He explained me for 10-15 min

Shortlisted 9 out of 21

#### **Group Activity**

Divided into 2 groups and each group was given some set of pictures initially..Some pictures were specifically given to individuals and others were common. We as group had to come up with a story using those images.After 5 min some more pictures were given to us and we were asked to add those images also in our story. All the discussions we had in the group was heard by them.

At last, in 5 min we had to tell the story as a team with each person talking about the part of story in which his specific picture fits in.

The theme of story was also specified as "Business Ethics"

#### **Tech Interview:**

1) Design Reservation system(long discussion) :

I designed Database for it and did lot many changes in my initial design. We discussed different issues which made me changing my design at various places.

How will u manage situation where two person see same seat number available and proceed for reservation at same time. I told him about transaction and locking, he said from which point of reservation will u lock and allow only one transaction to proceed.

I gave all kinds of possible answers but he was unsatisfied, I gave analogy of transaction from ATM and transaction from Net banking at the same time..and he asked me to tell the answer as to how to handle this situation.

At the end when I was not able to come up with something really working (other than locking the attributes), he said that these problems are very complex and do not have simple solution, he just wanted to see my thinking and asked in if I know about observer pattern.

2) Tell about design patterns

3) Tell about observer pattern

4) 12 balls puzzle

5) Implement queue using two stacks with best case of both enqueue and dequeue in O(1)

6) SQL queries :

Given three tables Student(sid,...) ,Class(cid,...) and joining table Student\_class(sid,cid)

Find all students names taking no class

I did it using "not exists" and subquery but he said subquery is not allowed

I told him that we can use "except" ,but he said no

Then he gave hint as join and I told him to do outer join and he was satisfied.

Query to find students taking more than one class

#### **HR round:**

1) Tell me about urself

2) Intern project

3) Project other than intern project

4) Asked about extra circular activities. What all those awards written in my resume actually means

5) Asked a question, explained the whole situation without paper and pen :

In short the question was how will u have distinct values of product names from the array of product class which contain product names as well as other attributes.

I told him to use Set, then he asked how it is implemented in java, I talked about hash set, he asked about specific function of class (whose hash set is made)

Which is called internally...which I did not know...and told him about simple hashing of strings and he was satisfied and told me the answer as hashCode function

He said how will u use threading in same problem and improve performance again I told me all kind of things like to have two thread which traverse the array in opposite direction(one from beginning and one from end ) and maintain the set as global variable

He said what if there are multiple such arrays..

6) I asked him about the frameworks they use and he went on explaining for 15 mins (of which I could not get much) and said how come u did not had any question in ppt. He was enjoying a lot in telling me all kind of things and wanted people to ask more questions at ppt and show interest

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Interview Experience  
Morgan Stanley

## **Morgan Stanley Interview | Set 1**

Morgan Stanley campus placement for post IT analyst.

#### **1st round – objective written test**

10 questions on aptitude and analytics

30 questions on programming

10 questions on computer fundamentals

They had sectional cut-off and selected 20 students

#### **2st round – coding written test**

5 questions on coding basically on data structures

1. Write a function to find the mirror image of binary tree

2. WAP to find the character which occurred maximum times in the character array
3. Given a 2d matrix find an element in a matrix which is 0 and make the entire row and column to 0
4. Find the minimum element in the rotated array of integers
5. Find highest length substring such that there are equal number of 0's and 1's in array of 1's and 0's only

#### **3rd round – Technical interview**

1. He asked to tell something about me
2. Then he asked a questions on my projects and internship
3. Then he asked me to write a modified bubble sort
4. Asked me to design a structure for storing stock market details for every quote/ company and store it as a linked list and asked me to write a linked list function like insertion and initialization
5. Then he asked me to store the live data of particular company of every 5 minutes and the history should be of 10 days, so it's a huge amount of data so it's very inefficient to use linked list so suggested to use hash map or circular array as it of fix size of 10 days.
6. There were other simple questions on data structures and databases

#### **4th round – Group Task/Discussion**

The group was formed by 6 people. They provided some 8-10 pictures based on business ethics and then we have to form a story using these pictures in 15 minutes and after this time they provided again 6 pictures and we have to include it in our story. And then we have to tell the story in group in 2 minutes. Then they asked some questions and asked us to rate everyone else in the group.

#### **5th round – technical interview**

Most of the questions were on databases and operating systems. Then some are probability questions

1. If your friend is being pointed by a gun by his enemy, consider a barrel of 6 bullets but it has only 2 bullets which were consecutive too, then an enemy rotates the barrel and pushes into a gun then he fires the trigger but the shot was empty, then he gave a choice for 2 shots that do you want to rotate the barrel again(randomly) or continue in this position only, so we have to find both the probabilities and find which one is lesser so that we can save our friend
2. The other question was we have to print

10 – 60% of the time we execute the program

20 – 10% of – –

15 – 30% of –

So we have to write a code so that when we execute the code for 100 times there will be 60 – 10's, 10 – 20's, 30 – 15's

Then asked me to draw tables for database of college for students, professors, time table and courses.

#### **6th round – HR interview**

Before going for HR interview we have to fill the form which has some common questions and all things about you like books you read, hobbies, place where you want to work, about post grad.

Normal HR round was there and asked some common questions such as about me, my past, my grades, interests, hobbies, pros – cons, achievements.

Also about future plans like post grad and position after 5 years, then he given some puzzles to solve the 100 prisons and 100 prisoners question to toggle the doors

I really thank geeksforgeeks for sharing very good questions for placement preparation.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Interview Experience  
Morgan Stanley

## **Directi Interview Experience | Set 17 (On Campus)**

Interviewers of Directi are completely different from other companies. He asked me relax first and started talking in Hindi about the college and stuff(completely irrelevant) and then he gave me a question(that too in Hindi only).

- Given 2 arrays of integers of size m and n where m>n. You need to maximize the dot product by inserting zeros in the second array but we cannot disturb the order of original arrays. Simple(dp is sol)

#### **2 round**

Another cool person but a little tough ques.

- Question – n cities and m roads(m>n), number of ways you can visit n-1 cities one by one (each time we start from the origin city and reach to destination through minimum path and we have to output the number of different combinations possible for all the visits(for each city) with given constraint).
- Deep discussion on modified Dijkstra's algo and using heap sort or not in it and discussion on time complexity as it will also vary according to methodology and then he gave me a hint on applying dp and I solved the question using dp and he was satisfied and he told me to proceed to final round.

#### **HR+ Technical round**

This was the worst round because it was the skype round and there was communication problem. The interview started with summer intern project discussion and I required to draw some diagrams to explain him and it was really difficult to explain him through the poor communication but he somehow got the idea of project.

- He asked there are 2 types of transactions in bank credit and debit, He asked how will you model the total amount of money available at bank..(threading question based on synchronization) he asked me to do in JAVA but I told him that I know C++ only, he told me to build in C++ but he wasn't seem to be satisfied fully however he said it's alright.
- Then he gave me real confusing problem —> we are given a huge data of points in 2D points and this point can be floating points. Now you are given queries where you are given a rectangle and you need to output the

all the points inside that rectangle.I proceeded by making buckets in x-axis and then for each bucket along x axis,(I further bucketed along the y-axis, he also helped me a bit in that.)

- Then he told he was done and if I had any question- I asked how the team is decided and what is general strength of team and how to switch(15 min discussion.)  
I thought that I did fine but may be CV and branch was the weak point as directi is very selective but very few reached the final round, they selected only 2 students but really good company to work in.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

# Directi Interview Experience | Set 16 (Pool-Campus for Application Developer)

There was coding round on CodeChef for 90 min duration. You cannot use custom test cases within their IDE or edit your code after running.

Profile offered Application Developer. Do practice on codechef environment.

They selected 3 students in this round it was a pool campus colleges participated were form across india. I m from Pune. The round was actually tough time will not sufficient. Those who do competitive programming for them it would be a bit easy. If you even solve at least one you will clear this round.

### Coding Problem 1 : Costly Visit

You have a grid of size N x M. Rows of the grid are numbered from 1 to N from top to bottom and columns of the grid are numbered from 1 to M from left to right. So, top-left corner is indexed as (1,1) and bottom-right corner is indexed as (N,M).

Cost of visiting a cell at index (i,j) is denoted by C[i][j]. Cost of changing the direction of your facing at index (i,j) is denoted by P[i][j].

You have to start from cell (1,1) and reach to cell (N,M) with minimum cost. At cell (1,1), you can either face towards 'Right' or face towards 'Down'. At any point of time, you can either face 'Right' or face 'Down'.

There are 2-types of moves allowed:

- Move one cell towards the facing direction i.e. if you are facing 'Right', you can move one cell 'Right' or if you are facing 'Down', you can move one cell 'Down'. The cost of visiting cell (i,j) will be C[i][j].
- Change the direction of facing i.e. if you are facing 'Right', you can now face 'Down' or if you are facing 'Down', you can now face 'Right'. The cost of changing the facing direction at cell (i,j) will be P[i][j].

Find the minimum cost to reach (N,M) after starting from (1,1).

Constraints:

1 <= T <= 3  
1 <= N,M <= 1000  
1 <= C[i][j], P[i][j] <= 1000

Input Format:

First line of each testfile contains T, the number of test cases.

In each testcase, First line contains two integers N and M denoting the dimensions of the grid.

Next N lines contains M integers each denoting the cost matrix C.

Next N lines contains M integers each denoting the cost matrix P.

Output Format:

For each test case, output a single line containing the minimum cost of reaching (N,M) from (1,1).

Example:

Input:

2  
2 2  
1 2  
3 4  
5 6  
7 8  
2 2  
1 2  
3 4  
5 6  
1 8

Output:

13  
9

### Coding Problem 2 : String to Number

You need to pass a secret key to your friend, which consists of all numbers but you don't trust the carrier. So, instead you pass a character string. You come up with a set of rules to map the string to the original key.

1. Each character in the string should be replaced as the rule suggests.
2. If the right hand side of the rule is a character, then this character should again be replaced till we find a number. The range of the numbers lies between 1 and 9.
3. If no such number could be found but a cycle is detected, each such character should be replaced with 0. Note that this includes numbers which map to themselves (self loops).
4. If no cycle is detected and no number replacement could be found, you should output -1.
5. If a character appears in the test string which does not appear in the mapping, output -1.

#### Input

First line of input contains a single integer T, the number of test cases. T test cases will follow. Each test case begins with a mapping. A mapping begins with a number N, the number of rules. Then N lines, each line in the form of A B will follow, where A is to be replaced by B. Then follows an integer K, the number of test strings. Then K lines follow, each line consisting of a test string.

#### Output

For each test case, print on the first line # followed by the test case number, followed by the replacement string for every test string.

#### Solution Templates

In the solution templates provided, complete the function whose signature is

#### C / C++

```
void decode (int n, char orig[26], char mapped[26],
int k, char inputs[32][128], char outputs[32][128])
```

#### Java

```
public static void decode(int n, char[] orig, char[] mapped,
int k, String[] inputs, String[] outputs)
```

'n' is the number of mappings. 'orig' and 'mapped' store the original and mapped values respectively. 'k' is the number of queries. 'inputs' are the encoded strings. It is expected that you will store your answers in 'outputs', which is then printed by the template. Note that in JAVA, do not allocate outputs. It will be allocated, and hence put your answers in outputs.

Note: You are allowed to edit the code as you please. Add / delete headers. Add / delete methods. And so on.. So long as your final code solves the problem with Input and Output as described above. You may submit your own code, without using the template at all.

#### Constraints

```
1 <= T <= 100
1 <= N <= 26
```

The left hand side of the rule consists of a single lowercase character

The right hand side of the rule consists of a single lowercase character or a single non zero digit.

No character will map to more than one character,

i.e. you cannot have a situation where a maps to both b and c.

#### Sample Input

```
1
10
a b
b c
c a
d e
e f
f 9
g h
i j
j 7
k p
3
abcdefghijkl
kabc
aza
```

#### Sample Output

```
#1
00099977
-1
-1
```

#### Explanation

String 1:a, b, and c form a cycle, and d maps to e, which maps to f, which maps to 9, and i maps to j, which maps to 7.

String 2: k maps to p, which maps to no nothing else. Hence -1.

String 3: The character z doesn't appear in the mapping. Hence -1.

#### Coding Problem 3: Binary Sum

In a binary tree, diameter sum between two leaf nodes is defined as sum of all the nodes in the unique path when traveling from one leaf to the other. Assume that the tree is a complete binary tree and every leaf node is at the same depth from root of the tree. Find the value of maximum diameter sum in a binary tree.

Note that the maximum diameter may be a single leaf node as well (since a single leaf node is also a valid diameter – the trivial path of length 0 from the leaf node to

itself).

#### Input

First line of input is the number T, which denotes the number of test cases.

Input for each case consists of 2 lines. The first line consists of the number of nodes N in the tree. The following line consists of the numbers A[1..n] which denote the value of each node in the tree.

The first element in the input is the root element of the tree. Considering index of root element is 1 in the following problem, left child of i'th element in the input is the  $(2^i)$ th element and right child of i'th element is  $(2^i+1)$ th element.

#### Output

Output consists of T lines denoting the value of maximum diameter sum in binary tree for each test case.

#### Solution Templates

In the solution templates provided, complete the function whose signature is

#### C / C++

```
int maxDiameterSum(int nodes, int tree[511])
```

#### Java

```
static int maxDiameterSum(int nodes, int[] tree)
```

The first argument to maxDiameterSum is the number of nodes in the tree. The second argument is tree, presented in an array format as described in the Input Section above. maxDiameterSum should return the value of the maximum diameter sum in the binary tree.

Note: You are allowed to edit the code as you please. Add / delete headers. Add / delete methods. And so on.. So long as your final code solves the problem with Input and Output as described above. You may submit your own code, without using the template at all.

#### Constraints

$T \leq 100$

$N \leq 511$

Range of value of nodes is between -100000 and 100000

N is of the form  $2k-1$ , where k is the height of the tree.

#### Sample Input

```
1  
7  
2 4 5 8 -4 3 -6
```

#### Sample Output

```
22
```

#### Explanation

Path followed to get the maximum diameter sum in this case is

8 (leaf node) => 4 => 2 => 5 => 3 (leaf node)

#### Solution:

I tried to solve but it didn't cleared edge cases.

<a href="http://code.geeksforgeeks.org/ReDZuU">http://code.geeksforgeeks.org/ReDZuU</a>

Don't memorize it. It won't help they will ask you algorithms in interview.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

## Directi Interview Experience | Set 15 (On-Campus)

### Round 1: Online test on Codechef contains 3 Coding Questions

1. Amanada, a school kid, is learning English alphabets. Her teacher devised a small game to make the task fun. A grid of 'm' rows and 'n' columns is filled with English alphabets. She needs to search English words in this grid by moving one step at a time in any of the adjacent grid cells. A grid of alphabets and a set of English words are given. Amanda can start from anywhere in the grid and can move in any of the 8 adjacent grid cells, one step at a time. Each grid cell can only be used once.

#### Input

You are given a template in which you need to implement a function whose signature is given below.

#### C

```
int findWordInAGrid(char grid[128][128], int m, int n, char word[32])  
/* return 0 for false, 1 for true. */
```

#### C++

```
bool findWordInAGrid(char grid[128][128], int m, int n, char word[32])
```

#### Java

```
static boolean findWordInAGridJava(char[][] grid, int m, int n, String word)
```

grid[][] represents the characters that are in the given grid. Only the first m rows and the first n columns should be considered relevant. word is the word whose occurrence has to be found in the grid. Remember, word may start from any location in the grid. word will never contain more than 30 characters. Return true if word is

found in the grid, false otherwise.

#### Output

The function should return true, if you can find the word in the grid and false otherwise.

#### Example

Let's consider the grid given below:

```
a b c  
d e f  
g h i
```

And set of words to be searched are:

```
abc  
abedhi  
efgh  
Output:  
The output of the above example should be:  
abc: true  
abedhi: true  
efgh: false
```

**2.** You are given a grid with 3 rows and N columns. Each cell in the grid contains the value 0 initially. You perform several operations of the following type on the grid Pick a row, say r. Pick a start column and end column, say s and e. Of course  $1 \leq s \leq e \leq N$ . Now, set all values in the grid in row r, from column s to column e to 1. After you perform all the operations, you wish to find subgrids in this grid (or rectangles, if you please) which contain only 1s. Most importantly, you wish to find the rectangle that has the largest area. Print the area of this rectangle.

#### Input

The first line of input contains a number T, the number of test cases. The first line of each test case contains the number N and M respectively, separated by a single space. N is the number of columns in the grid. M is the number of operations you perform on the grid. Each of the next M lines contain three integers R, C1 and C2 respectively to describe the operation. R is the row in which the operation is performed. C1 and C2 are the start and end columns respectively. You may assume that  $1 \leq C1 \leq C2 \leq N$ .

#### Output

For each test case output a single number on a line by itself. This number should be the area of the largest rectangle that can be chosen on the grid – which contains only of 1s.

#### Constraints

```
1 \leq T \leq 100  
1 \leq N \leq 1000000  
1 \leq M \leq 1000
```

**Attention:** The test data is designed such that solutions that simulate each operation in O(N) will get TLE. You should be able to solve each test case in O(N). Hint: Convert each operation to a pair of "start" and "end" events. Observe that the order of operations doesn't matter. Thus you can process the events in increasing order of columns. You can also simply store how many events start / end at each cell (since all events are alike and have idempotent effect). Now, you can walk through the grid column by column maintaining the longest streak of 1s towards the left in each row. This helps in considering the best possible rectangles with their right edge at current column.

#### Sample Input

```
3  
5 2  
1 1 4  
2 3 5  
10 3  
1 1 8  
2 2 10  
3 1 9  
5 2  
2 1 4  
3 3 5
```

#### Sample Output

```
4  
21  
4
```

#### Explanation

In the first test case the final grid looks like

```
11110  
00111  
00000
```

We can see that the largest rectangle with 1s has the area 4. There are two such rectangles. 1,1 –

1,4. And 1,3 – 2,4.

In the second test case the final grid looks like

```
1111111100  
0111111111  
1111111110
```

The largest rectangle is 1,2 – 3,8. The area of this rectangle is  $3 \times 7 = 21$ .

**3.** You are given N stones, labeled from 1 to N. The i-th stone has the weight  $W[i]$ . There are M colors, labeled by integers from 1 to M. The i-th stone has the color  $C[i]$  (of course, an integer between 1 to M, inclusive). You want to fill a Knapsack with these stones. The Knapsack can hold a total weight of X. You want to select exactly M stones; one of each color. The sum of the weights of the stones must not exceed X. Since you paid a premium for a Knapsack with capacity X (as opposed to a Knapsack with a lower capacity), you want to fill the Knapsack as much as possible.

Write a program that takes all the above values as input and calculates the best way to fill the Knapsack – that is, the way that minimizes the unused capacity. Output

this unused capacity. See the explanation of the sample test cases for clarity.

#### Input

The first line of input contains the integer T, the number of test cases. Then follows the description of T test cases. The first line of each test case contains three integers, N, M and X, separated by singlespace. The next line contains N integers, W[1], W[2], W[3] ... W[N], separated by single space. The next line contains N integers C[1], C[2], C[3] ... C[N], separated by single space.

#### Output

An optimal way of filling the Knapsack minimizes unused capacity. There may be several optimal ways of filling the Knapsack. Output the unused capacity of the Knapsack (a single integer on a line by itself) for an optimal way. If there is no way to fill the Knapsack, output -1. Output T lines, one for each test case.

#### Constraints

$1 \leq T \leq 10$

$1 \leq M \leq 100$

$M \leq N \leq 100$

$1 \leq W[i] \leq 100$

$1 \leq C[i] \leq M$

$1 \leq X \leq 10000$

#### Sample Input

4

9 3 10

2 3 4 2 3 4 2 3 4

1 1 1 2 2 2 3 3 3

9 3 10

1 3 5 1 3 5 1 3 5

1 1 1 2 2 2 3 3 3

3 3 10

3 4 4

1 2 3

3 3 10

3 3 3

1 2 1

#### Sample Output

0

1

-1

-1

#### Explanation

In the first test case you can select stone 2, stone 5 and stone 9. The knapsack will be completely full. Of course, there are several other ways to select stones such that the knapsack is full. The unused capacity in all such ways is 0.

In the second test case you cannot select stones such that the knapsack is completely full. You can select stones {1, 4, 9}, such that the unused capacity is  $10-1-1-5 = 3$ . But there is a better way. Select stones {2, 5, 8}. The unused capacity is  $10-3-3-3 = 1$ . This is the optimal way. There is another way that is optimal. Select stones {1, 5, 9}. The unused capacity is  $10-1-3-5 = 1$ . In the third test case there is only one option. Select stones {1, 2, 3}. The total weight will be 11. This is more than what the knapsack can hold. In the fourth test case there is no stone of color 3. Thus, there is no valid selection of stones possible.

#### The answer will be -1.

Those who solved one question were selected for second round.

#### Round 2: (Skype Interview – 45 Minutes)

- Given a grid of  $m \times n$ , a player P1 & P2 is at node  $(x_1, y_1)$  &  $(x_2, y_2)$  respectively. There are n gems placed on different positions of grid i.e.  $(G_1, G_2, G_3, \dots, G_n)$ . Calculate the minimum cost required to pick all the gems. A gem can be picked by a single player. Gems should be picked in particular order i.e.  $G_1$  should be picked first then  $G_2$  & then  $G_3$  so on.

#### For example:

P1 (1,1) & P2(3,4)

There are 4 gems:

$G_1(1,1), G_2(2,2), G_3(3,2), G_4(4,2)$

Total cost: 5

P1 will pick  $G_4$ .

P2 will pick  $G_1, G_2, G_3$ .

Complexity :  $O(n)$

#### Round 3: (Skype Interview- 45 Minutes)

- Given an array of n elements. ' $n$ ' operations needs to be performed on the array. For each operation  $\text{start\_index}$ ,  $\text{end\_index}$ ,  $\text{trim\_value}$  is given. One has to trim the value starting from the  $\text{start\_index}$  to  $\text{end\_index}$  inclusive. If the value at that index is more than or equal to  $\text{trim\_value}$  then make it equal to  $\text{trim\_value}$  else leave it as it is. After performing ' $n$ ' operations find the maximum value of the array.

Complexity:  $O(n)$

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## GATE CS Corner Company Wise Coding Practice

# Directi Interview Experience | Set 15 (1st Round of On-Campus)

Hi, I recently appeared for the 1st round of Directi's recruitment process. Students were divided into 2 slots. The questions for the slots were as follows :

## SLOT 1 :-

1. Maximum Sized Rectangle in a binary Array <http://www.geeksforgeeks.org/maximum-size-rectangle-binary-sub-matrix-1s/>
2. Blueberry Cheese Cake: There is a school in a village. It has N classes. One fine day, someone donated B blue berry cheese cakes to schools. Now you need to divide these cakes such that:
  - Each class gets at least 1 cake.
  - Each class will share the cake(s) among students.
  - Your aim is to minimize the maximum number of students per cake in any class.
3. Tree Updation

## SLOT 2 :-

1. Boggle  
<http://www.geeksforgeeks.org/boggle-find-possible-words-board-characters/>
2. Given a binary tree, such that each node contains a number. Find the maximum possible sum in going from one leaf node to another.
3. Toffee Shop. Similar to Knapsack problem. You have a budget which you input as b. You are given an array of calories for each toffee and another array with associated cost for each toffee. Your goal is to maximize the calorie intake before the money doesn't exceed the budget. Each toffee can be purchased only once.

I solved 2 questions and knew the algorithm correctly but missed some edge case, and simply received "wrong answer". No consideration to partial test cases.

Overall a very difficult experience for us. Only 1 student cleared this round. He was able to solve only 1 question and that too because he had solved the question earlier. Mostly he was selected because he had a CGPA above 9.5.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

# Directi Interview Experience | Set 14 (On-Campus)

Direct I came for Full Time recruitment for Applications Engineer, Operations Engineer and Platform Engineer in our campus.

## Round 1

Online test on Codechef contains 3 Coding Questions

1. Find the maximum sum of path between any two leaf nodes in a binary tree represented as an array.

Example:

Given Tree – {1,2,3,4,5,6,7}

Answer: (5+2+1+3+7) = 18

2. Find the given words in a grid. Return true if present else return false.

Example:

grid = {{a,b,c},{d,e,f},{g,h,i}};

words to find = {"abc", "abeih", "efg"}

Answer : true, true, false

Similar Question – <http://www.geeksforgeeks.org/boggle-find-possible-words-board-characters/>

3. Some tree Related Question (Tough One)

Those who solved 1 coding question complete are selected for next round.

## Round 2

Data Structure Design Round (36 minutes) [Skype Interview]

The interview contains one data structure question i.e.

Design a data structure which will find minimum gap in O(1).

Insert(x) – O(logn)

Delete(x) – O(logn)

Search(x) – O(logn)

mingap() – O(1)

Note – mingap is the minimum absolute difference between two elements present in the structure.

Example: {4, 7, 9, 1, 5, 12, 18}

mingap is 1 (5-4)

Note – Same question for all at same time

## Round 3

Algorithm Design Round (50 minutes) [Skype Interview]

The interview contains 1 Algorithm design question

Given n boxes of different weights and m machines of different weight carrying capacity. Find the minimum time required to move all boxes. Each machine take 1 minute to carry one time.

Since the connection got lost, she called me again after some time and changed the question.

You are playing on a ladder with some moves and with some constraints over you. You are given a int [] changeLevels, the ith element of which is the number of levels you will change with respect to your current position that is you can move changeLevels[i] steps UP or changeLevels[i] steps DOWN any of the one. You are also given the beginLevel which is your

initial position on ladder and maxLevel which is the highest level of ladder. In any case while executing You can't go beyond the maxLevel or below level 0(Zero). Return the maximum Level you can attain after executing all the changeLevels i.e. final level. If there is no way to go through the list without exceeding maxLevel or going below 0, return 1.

Note – Optimized Algorithm is required, not simple recursion solution.

No one got selected for Operations Engineer, however some are selected for interview for Applications Engineer. i.e. Again all rounds except coding round.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

### Directi Interview | Set 13

There was coding round on CodeChef for 3 hours duration. You cannot use custom test cases within their IDE or edit your code after running.

#### Coding Problem 1

Amanada, a school kid, is learning English alphabets. Her teacher devised a small game to make the task fun. A grid of 'm' rows and 'n' columns is filled with English alphabets. She needs to search English words in this grid by moving one step at a time in any of the adjacent grid cells. A grid of alphabets and a set of English words are given. Amanda can start from anywhere in the grid and can move in any of the 8 adjacent grid cells, one step at a time. Each grid cell can only be used once.

**Input:** You are given a template in which you need to implement a function whose signature is given below.

```
C
/* return 0 for false, 1 for true. */
int findWordInAGrid(char grid[128][128], int m, int n, char word[32])

C++
bool findWordInAGrid(char grid[128][128], int m, int n, char word[32])

Java
static boolean findWordInAGrid(char[][] grid, int m, int n, String word)
```

- grid[][] represents the characters that are in the given grid. Only the first m rows and the first n columns should be considered relevant. word is the word whose occurrence has to be found in the grid.
- Remember, word may start from any location in the grid. word will never contain more than 30 characters. Return true if word is found in the grid, false otherwise.

**Output :**The function should return true, if you can find the word in the grid and false otherwise. Example Let's consider the grid given below: a b c d e f g h i And set of words to be searched are: abc abedhi efg

The output of the above example should be: abc: true abedhi: true efg: false Constraints 1 ≤ m,n ≤ 100

#### Coding Problem 2 :You will get 2 points for solving this problem

You are given a rooted tree. The tree is not necessarily binary. The tree contains N nodes, labeled 1 to N. You are given the tree in the form of an array P[1..N] of size N. P[i] denotes label of the parent of node labeled i. For clarity, you may assume that the tree satisfies the following conditions.

- The root of the tree is labeled 1. Hence P[1] is set to 0. The parent of node T will always have a label less than T. Hence P[i] < i will always be true. All nodes contain a mutable value (or, more simply, a variable), which is initially set to 0.
- You are asked to perform several operations of the following type ADD X Y: add Y to the value at node X. ADDUP X Y: add Y to the value at node X. Then, add Y to the value at P[X] (i.e. the parent of X). The, add Y to the value at P[P[X]] (i.e. the parent of P[X]).. and so on, till you add Y to the value at root.
- After you have performed all the given operations, you are asked to answer several queries of the following type VAL X: print the value at node X. VALTREE X: print the sum of values at all nodes in the subtree rooted at X (including X).
- Input- The first line of input contains the number T, the number of test cases. Then follows the description of T test cases. The first line of each test case contains the numbers N, M and Q respectively (separated by single space character). N depicts the number of nodes. M depicts the number of operations you must perform. Q depicts the number of queries you must answer. The next N lines contain a number each, depicting the array P[1..N]. Of course the number on the first such line is always 0. The next M lines contain description of the respective operation. An operation will be either "ADD X Y" or "ADDUP X Y" (without the quotes).
- Please refer to the problem statement and sample I/O explanation for clarity on the meaning of the operations. After the operations, the next Q lines contain description of the queries. A query will be either "VAL X" or "VALTREE X" (without the quotes). Please refer to the problem statement and sample I/O explanation for clarity on the meaning of the queries. Output Print the result of each query on a line by itself. Since the answer for some queries may be too large, please print the result modulo 1,000,000,007. Do not print any blank lines between test cases. Constraints 1 ≤ T ≤ 10, 1 ≤ N ≤ 50000, 1 ≤ M ≤ 50000, 1 ≤ Q ≤ 50000, 1 ≤ X ≤ N, 1 ≤ Y ≤ 50000. The input file will be smaller than 2 MB.

**Sample Input** 2 5 5 3 0 1 1 1 3 ADD 1 10 ADD 2 20 ADD 3 30 ADD 4 40 ADDUP 5 50 VAL 3 VALTREE 3 VALTREE 1 7 4 5 0 1 2 2 2 1 2 ADD 6 76 ADDUP 1 49 ADD 4 48 ADDUP 2 59 VALTREE 1 VALTREE 5 VAL 5 VAL 5 VALTREE 2 VAL 2

**Sample Output** 80 130 250 291 0 0 107 59 Explanation In the first sample case, at the end of app the operations, the values at each of the nodes is as follows 1: 60 2: 20 3: 80 4: 40 5: 50 Also, the sum of the values of all the nodes in the subtree rooted at each of the nodes is as follows 1: 250 2: 20 3: 130 4: 40 5: 50

### Coding Problem 3: You will receive 1 point of solving this problem

In a binary tree, diameter sum between two leaf nodes is defined as sum of all the nodes in the unique path when traveling from one leaf to the other. Assume that the tree is a complete binary tree and every leaf node is at the same depth from root of the tree. Find the value of maximum diameter sum in a binary tree. Note that the maximum diameter may be a single leaf node as well (since a single leaf node is also a valid diameter the trivial path of length 0 from the leaf node to itself).

**Input :**First line of input is the number T, which denotes the number of test cases. Input for each case consists of 2 lines. The first line consists of the number of nodes N in the tree. The following line consists of the numbers A[1..n] which denote the value of each node in the tree. The first element in the input is the root element of the tree. Considering index of root element is 1 in the following problem, left child of i'th element in the input is the  $(2^i)$ th element and right child of i'th element is  $(2^i+1)$ th element.

**Output :**Output consist of T lines denoting the value of maximum diameter sum in binary tree for each test case. Solution Templates In the solution templates provided, complete the function whose signature is C / C++ int maxDiameterSum(int nodes, int tree[511]) Java static int maxDiameterSum(int nodes, int[] tree) The first argument to maxDiameterSum is the number of nodes in the tree. The second argument is tree, presented in an array format as described in the Input Section above. maxDiameterSum should return the value of the maximum diameter sum in the binary tree. Note: You are allowed to edit the code as you please. Add / delete headers. Add / delete methods. And so on.. So long as your final code solves the problem with Input and Output as described above.

You may submit your own code, without using the template at all. Constraints T ? 100 N ? 511 Range of value of nodes is between 100000 and 100000 N is of the form 2 k 1, where k is the height of the tree. Sample Input 1 7 2 4 5 8 4 3 6

Sample Output 22 Explanation Path followed to get the maximum diameter sum in this case is 8 (leaf node) => 4 => 2 => 5 => 3 (leaf node)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

### Directi Interview | Set 12 (On-Campus)

Recently Directi visited our campus for placements for three profiles –

1. Platform Engineer
2. Applications Engineer
3. Operations Engineer

This process is for the first two profiles, I did not apply for Operations.

#### Round 1: Online coding round (263 applicants)

Q1. Given cost C[i] and calorie content P[i] of n chocolates, find the maximum amount of calorie one can take in a budget of W money units. Constraints : W <= 1000, n <= 100, C[i]<=100, P[i] <= 100.

Q2. Given 2 strings s and p of same length. (length<=16)

Define dist(string a, string b) = max(distinct characters in a, distinct characters in b).

A valid operation is to exchange characters at the same index between s and p. Eg: if s="abaa" and p="baab", then after one operation, we can get s="aaaa" and p="bbab" (Exchanging characters at index 1).

Find the minimum value of dist(s,p) if s and p can undergo the described operation any number of times.

Q3. Given a tree with n nodes in the following manner – In array par, par[i] denotes parent of node i in the tree. Root is always at index 1 and par[1]=0. Also, index of child nodes is always greater than index of parent.

Given q queries, process each of them ->

- a) ADD(x,y) : Add value y to node x.
- b) ADDUP(x,y) : Add value y to all nodes in the path from root to node x.
- c) VAL(x) : Print value of node x.
- d) VALTREE(x) : Print sum of values of all nodes in the subtree with root x.

Constraints: 1<=n<=1,000,000

1<=q<=1,000,000

Those who solved at least two questions were shortlisted.

#### Round 2: F2F Algo round 1(31 shortlisted candidates)

Consisted of only 1 algorithm based question, so did the next two rounds. Had to write the code.

Q. Given an nxn chessboard and position (x,y) of a knight on it, what is the probability that it stays in the chessboard after k moves.

#### Round 3: F2F Algo round 2 (20 shortlisted candidates)

Only approach was asked.

Q. Points from (0,0) to (R,C) in the cartesian plane are colored r, g or b. Make a triangle using these points such that-

- a) All three vertices are of different colors.
- b) At least one side of triangle is parallel to either of the axes.
- c) Area of the triangle is maximum possible.

Output the maximum possible area.

Constraints : 1<=R<=1000, 1<=C<=1000

9 people were directly shortlisted for final interview, and 4 were immediately rejected. Rest 7 were called for Algo round 3.

#### Round 4 : F2F Algo round 3 (7 candidates)

Given heights of n rows of grass H[n]. A farmer does the following operation k times->

Selects start index (s), end index (e) and a height (h). Fixes his grass trimming instrument at height h and trims the grass from row-s to row-e. Meaning, for each H[i] for

i between s and e,  $H[i] = \min(H[i], h)$ .

Print all heights after k operations.

Attention -> If  $H[i]$  was 6 and  $h$  was 4, then after trimming  $H[i]$  becomes 4 (does not reduce by 4).

Prohibited ->

a)  $O(nk)$  solution.

b) Use of Segment Tree(Only Update operations are there, so Segment Tree is overkill).

c) Use of BIT.

Expected time complexity –  $O(n\log n)$ .

I gave all these approaches before the interviewer rejected them, then gave an approach using heaps with time complexity  $O(n\log n)$ , but he wanted a simpler approach.

Only 1 candidate from these 7 was called for final interview (in addition to the 9 previously selected). I was rejected in this round.

#### Final Interview : Telephonic(over Skype, 10 candidates)

I didn't give this round but here's what they asked-

1. Introduction about yourself.
2. Projects done, past internships.
3. Questions related to DS (around 6-7).
4. Questions related to networking (around 10-12).
5. Questions related to DBMS and OS (around 10-12).
6. Few HR questions.

Finally, 4 candidates were selected, 3 as Platform Engineers and 1 as Applications Engineer.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

### Directi Interview | Set 11 (On-Campus)

Directi came to my college for Operations Engineer (DevOps) profile. There was a presentation and PPT(pre-placement talk) through which we got a chance to interact with them and got know more about Directi initiatives.

#### Interview Process:

1. MCQ (DOT Test)
2. Coding Round (Offline with Documentation)
3. Face to Face (Technical Interview)
4. Face to Face (Technical Interview)
5. Face to Face (Technical + HR Interview)

#### 1. MCQ:

This was a pen and paper round with 20 MCQs to be answered in 30 min. Most of the questions were easy. The topic coverage was good. The questions were from OS, CN, ALGORITHMS, DS, DBMS, General Aptitude. Marking scheme was +5 for correct choice, -1 for wrong choice and 0 for unattempted questions.

Some of the questions I remember:

1. The sticky bit is set in which directory.
2. The root DNS make recursive, simple or complex lookup.
3. Which among these is not a public IP?
4. Which scheduling results into starvation?

#### 2. Coding Round:

The internet connection of the Desktop was terminated. A server in local network was providing us with the questions and the Documentation required for solving the problems. The Linux environment was required and choice of language was given. The Directi people were very cooperative and were helping us if we got stuck in some part.

The question paper was divided into 3 sub-parts with last one being the bonus part. They asked us to complete the coding round in 90 min but later they extended the time to 120 min.

#### Problem Statement

Implement an in memory key value datastore server with the following features:

The program should create a socket which listens on port 60## (where ## is your user number). A client program NEED NOT be written to connect to the socket. telnet can be used. Once connected to your program it should support the setting and retrieval of keys:

set

get

Eg:  
set hello world  
get hello  
Output: world  
keys  
"Printing list of keys"  
1) hello

## Objective 2

Create a second instance of the same program running on a different port  
Write a client that is capable of taking input values from a file / telnet  
Your client must be able to intelligently shard data across the two instances of your program via sockets

Eg:  
"Start two instances of your server – A and B"  
SET raghu 21 # Data goes to server A  
SET bharath 23 # Data goes to server B  
SET ayush 22 # Data goes to server A  
SET kalyan 24 # Data goes to server B

### Bonus Question:

If there is a ttl value set for the key, it should be deleted from the memory once ttl is expired.

set

Eg:

set hello world 60

In the above case the key hello should be deleted, 60 seconds after it has been set.

Hints for C/C STL library to make your coding.

### NOTE:

After I was done with coding all the three problems, they asked me to explain my logic behind the implementation and why am i using that approach. They were asking questions related to my code and the use of different functions, what they return and what they take as arguments. They also gave me an another part to implement, which was:

"Enter the keyword key followed by the key itself and it will return the time left after which it will expire."

Eg:

key hello

Output : 10

## 3. Face to Face Interview (Technical Interview)

During this face to face round the questions were asked from almost every thing that was mentioned in my CV. Most of the questions where from my self project and my Summer Internship. This round lasted for near about 90 min.

Some general questions I can recall are:

1. The utility used to monitor the resource utilization of the linux system.
2. How will you design a service which is scaleable ?
3. The different types of memory a process has got.
4. How to check the free RAM of the system using htop command and what are the different colors indicator of ?
5. What is Load Balancer ?
6. How will you efficiently balance load given N servers using a load balancer ?

## 4. Face to Face Interview (Technical Interview)

This round lasted for for about 60 min. There were many in depth questions on Networking and Operating Systems. Few questions I remember now are:

1. Which mobile phone you use and what processor it has ? Tell me in details all specifications of your mobile phone.
2. DNS working.
3. What happens when you write 8.8.8.8 in your web browser ? your laptop is connected to internet such that it has an IP address of 172.16.1.22.  
(Asked me to write this in answer in 10 A4 sheets along with diagrams and along with as much details possible.)
4. What happens when you communicate to IP address 172.16.1.23 ? given your IP address 172.16.1.22.

## 5. Face to Face Interview (Technical + HR)

This round lasted for about 30-40 min. The technical questions were easy ones. The entire round was like a talk on what will I be doing as DevOp, the learning curve once I join the company, whether I am interested in further studies or not and what are the non-academic activities i like?

What have i planned for rest of my life?

The best thing was that the entire process went so smooth that I never realised i am giving an interview. The Directi people were so calm and helpful, that every time I got stuck, they used to hint me up. Mine was a ZERO dress code interview. I am very bad at remembering the full forms and the names so I used to tell them the logic

and the working and they were fine with it. All thanks to geekforgeeks and my laptop :).

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

### Directi Interview | Set 10 (On-Campus)

Directi came to my college for DevOps profile. The day started with PPT( pre-placement talk) and i was impressed with the work they are doing. So, I decided to give a shot.

The whole process consists of : MCQ round, Coding round and 3 face to face interviews.

#### 1. MCQ:

In this round they gave 20 MCQs. We have to solve them in 30 min. The questions are solvable but few of them are difficult. The questions are from OS, CN, Algorithms and Data Structure, and general aptitude. One can solve them in 30 min but the catch is that each wrong answer carry negative marks(1/5 th).

#### 2.Coding Round

In this round they gave one coding problem which contain three sub parts and one bonus part.We have solve this problem in 2 hours.This question is based on client – server model. You can use any language of your choice they will provide you the required documentation. Directi people are so helpful and gave lot of support while solving the problem.

**Problem :**

- a) Write a client server programs that use tcp connection to communicate and transfer a text file from client to the server.
- b) Client will send the file name and directory. The server has to create file name in that particular directory and save the data in the file.
- c) The user at the client end dynamically update the file like deleting the whole content of the file or appending more data at the end of the file. The client can able to adopt accordingly to send the data.

**Example:** Suppose in.txt contains 3 lines of data and the client has already sent first 2 lines, if a user opens the file suddenly and delete the whole data, then client should stop sending data. Instead of deleting the data if the user append 4 more lines then the client should sent the remaining 5 lines.

**d)Bonus:** If the user suddenly press ctr+C then the client should print the total number of bytes that it has sent to the server, before it get terminated.

#### 3.Face To Face:

This is pure technical round. It lasted for almost 40 min. In this round they asked more questions on OS, CN and few on linux. They are looking for practical answers rather than text book based answers. It will be more effective if you can answer them based on your experience. Interviewer asked me to select any one of them and i chose OS so he started with OS.

1. What is the difference between process and thread. Why we need threads?
2. What is deadlock and give one example?
3. What is semaphore and mutex?
4. Can you list all cpu scheduling algorithms that you know? What is your favorite algorithm and why? can you come up with new algorithm and explain how it works?
5. What is DNS and why we need it? Can you explain whole DNS message exchange process to convert url to IP address.
6. What is TCP and can you explain three way handshaking? what is man in middle attack and how it can happen in this handshaking process.
7. Since we have MAC, why we need IP address?
8. What is UDP, can you name few applications where UDP is used and why not TCP?
9. What is the method to find the MAC address of PC in the same LAN(I told them using ARP Table we can find the MAC)
10. what is the use of Ifconfig

#### 4.Face To Face:

This round is purely based on resume. They asked me about my projects that i mentioned in the resume and the challenges that i faced during that time.This round lasted almost 30min.

1. Can you draw the tcp/ip protocol stack and explain the functionality of each layer.
2. I did a project on randomized algorithm to mine frequent item-sets. So they asked me how my approach improve mining task.
3. I had one year work ex so they asked me about my role and the challenges that i faced in that period.

#### 4.Face To Face:

This round is more focused on distributed systems and infrastructure. They asked me about infra planning and load balancing. Few more questions on my resume. There was no HR round so they asked hr related questions in this round. are you really interested in DevOps profile. My resume contained algorithms related stuff so it might be reason for this question.

The whole process went very smoothly and the directi people were really helpful and encouraging.

Thanks GeeksforGeeks Team and continue your amazing journey.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

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## Directi Interview | Set 9 (On-Campus)

### Catch The Train

You are walking down the escalator to catch a subway train. The escalator itself moves at a speed of  $V_e$  meters per minute. You can walk down the escalator at a relative speed of  $V_y$  meters per minute. The length of the escalator is  $L$  meters. Trains arrive  $T$  minutes apart. Let  $t$  be the time between your arrival to the station if you stand still on the escalator and the arrival of the last train before your arrival. Assume that  $t$  is a random variable uniformly distributed between 0 and  $T$ . Return the probability of catching an earlier train if you choose to walk down the escalator instead of standing still on it.

Input :

The first line of the input contains an integer  $T_c$  denoting the number of test cases.

Each test case contains the following 4 lines

$V_e$  – velocity of escalator

$V_y$  – your relative velocity with the escalator

$L$  – length of escalator

$T$  – Time Period of Trains

Output

For each test case, output a single line containing the expected probability having an absolute or relative error less than  $10^{-6}$ .

Constraints

$0 \leq T_c \leq 5 * 10^7$

$1 \leq V_e \leq 1000$

$1 \leq V_y \leq 1000$

$1 \leq L \leq 10^5$

$1 \leq T \leq 10^6$

Example

Input:

2

10

10

20

2

10

10

100

4

Output:

0.5

1.0

Explanation

Example case 1. If you stand still, it'll take you  $20/10 = 2$  minutes to reach the bottom of the escalator. If you choose to walk, it'll make you  $20/(10+10) = 1$  minute. In the second case you save 1 minute and in 50% of the cases it'll allow you to catch an earlier train.

Example Case 2. Here, if you choose to walk instead of stand still, you will save 5 minutes and you will certainly be guaranteed to catch an earlier train.

### Toffee Boxes

You have  $N$  toffee packets, each containing different number of toffees. The number of toffees contained in the  $i$ th packet is denoted by  $c_i$ . You need to put these toffee packets in  $M$  boxes such that each box contains at least one toffee packet, and the maximum number of toffees in a box is minimum.

You can only choose consecutive toffee packets to put in a box.

Input

The first line of the input contains an integer  $T$  denoting the number of test cases.

The first line of each test case contains two space separated integers  $N, M$  denoting the number of toffee packets and the number of boxes respectively. The second line of each test case contains  $N$  space separated integers  $c_1, c_2, \dots, c_N$  where  $c_i$  denotes the number of the toffees in the  $i$ th toffee packet.

Output

For each test case, output a single line containing the maximum number of toffees in a box. Also, output -1 if such an assignment of toffee packets to boxes is not possible.

Constraints

$1 \leq T \leq 20$

$1 \leq N, K \leq 100000$

$1 \leq c_i \leq 1000$

Example

Input:

1

4 2

10 3 5 7

Output:

**Explanation**

Below are the possible assignments of toffee packets to boxes.

1. 10 [3 5 7]
2. 10 3 [5 7]
3. 10 3 5 [7]

For minimizing the maximum number of toffees in a box, we choose the second assignment, and hence the output should be 13

**Guess Your Way Out**

Amr bought a new video game "Guess Your Way Out!". The goal of the game is to find an exit from the maze that looks like a perfect binary tree of height  $h$ . The player is initially standing at the root of the tree and the exit from the tree is located at some leaf node.

Let's index all the leaf nodes from the left to the right from 1 to  $2^h$ . The exit is located at some node  $n$  where  $1 \leq n \leq 2^h$ , the player doesn't know where the exit is so he has to guess his way out!

Amr follows simple algorithm to choose the path. Let's consider infinite command string "LRLRLRLRL..." (consisting of alternating characters 'L' and 'R'). Amr sequentially executes the characters of the string using following rules:

1. Character 'L' means "go to the left child of the current node";
2. Character 'R' means "go to the right child of the current node";
3. If the destination node is already visited, Amr skips current command, otherwise he moves to the destination node;
4. If Amr skipped two consecutive commands, he goes back to the parent of the current node
5. before executing next command;
6. If he reached a leaf node that is not the exit, he returns to the parent of the current node;
7. If he reaches an exit, the game is finished.

Now Amr wonders, if he follows this algorithm, how many nodes he is going to visit before reaching the exit?

**Input**

First Line contains  $T$  the number of test cases

The next  $T$  lines contains 2 integers  $h, n$

**Output**

Output  $T$  lines each containing an integer representing the number of nodes (excluding the exit node) Amr is going to visit before reaching the exit by following this algorithm.

**Constraints**

$1 \leq T \leq 10$

$1 \leq h \leq 50$

$1 \leq n \leq 2^h$  Example Input: 1 2 2 Output: 2 Explanation Example case 1. Amr would visit first root node then root->left node and then go to the root->left->right node which is the exit. hence 2 nodes visited before reaching the exit

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

**GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Directi

**Directi Interview | Set 8 (Off-Campus)**

I applied for Directi off-campus on its career website and I got a call. There were total 5 rounds.

**Online coding round: 1.5 hours**

There were a total of 3 questions. All of them were coding questions covering ad-hoc, dp ,hashing ,graphs etc and you could do it only if you do regular online competitive coding. This round was the toughest and you should pick wisely, the questions you want to attempt. I did two of these.

Q1- Blueberry Cheese Cake:

**Problem description**

There is a school in a village. It has  $N$  classes. One fine day, someone donated  $B$  blue berry cheese cakes to schools. Now you need to divide these cakes such that: Each class gets at least 1 cake.

Each class will share the cake(s) among students.

Your aim is to minimize the maximum number of students per cake in any class.

**Input**

The first line of the input contains two space separated integers  $N$  and  $B$  denoting the number of classes and total number of blue berry cheese cakes, respectively.

Next  $N$  lines contain number of students in each class.

**Output**

For each test case, output the maximum number of students who will share a cake.

**Constraints**

2

**Q2: Poor Valet**

Our Chef is opening a new restaurant in the city. Today being the inauguration night of his new restaurant and Chef's huge popularity has attracted a large crowd for the

grand opening. For convenience of the customers, cars of all the customers have been marked with a number from 1 to N where N is the total number of cars, corresponding to their parking space number in which each car has to be parked. Due to the large crowd, the car parking is full except for one parking space. Moreover, as the cars came too frequently, they could not be parked in their respective parking space. Poor valet at the restaurant's parking, Raka, is left with the arduous task of parking the cars at their respective places. Luckily for him, parking has been closed and no more cars are coming and he can now arrange the cars in their proper places. As Raka is left alone to park the cars, he can only move one car from one parking to the other parking. He can use the empty parking space to move the cars around. He wants to arrange the cars in as few moves as possible. Raka asks you for help in finding the optimal strategy to arrange cars in their proper places.

#### Input

An integer T denoting the number of test cases.

For each test case there are 2 lines.

The first line contains a single integer N where N denotes the number of cars.

The second line contains N integers

$K_0 \text{ to } K_{N-1}$  where  $K_i$  represents the number marked on the car standing at parking space number  $i$  in the initial configuration.

Parking lot number N is left empty.

#### Output

For each test output a single integer M, where M is the number of car moves required to arrange all the cars to their proper location.

#### Example

Input:

2

3

1 0 2

4

2 1 3 0

Output:

3

4

### **Q3: XML Validator**

#### Problem description

Let's define a string as an opening tag, where x is any small letter of the Latin alphabet.

Each opening tag matches a closing tag of the type , where x is the same letter.

Tags can be nested into each other i.e., one opening and closing tag pair can be located inside another pair.

Let's define the notion of a XML-text:

- 1) An empty string is a XML-text
- 2) If S is a XML-text, then " S " (quotes and spaces are for clarity) also is a XML-text, where a is any small Latin letter
- 3) If S1, S2 are XML-texts, then "S1 S2" (quotes and spaces are for clarity) also is a XML-text

You are given a string. You have to verify if the given string is a valid xml or not.

#### Input

First line contain T number of test cases

For each test case:

Only one line containing xml tagged string S.

#### Output

For each test case,

One line containing a string TRUE if s is a valid xml FALSE if it is not.

#### Constraints

0 <b></b></a>

<a><b></a>

#### Output:

TRUE

FALSE

#### Explanation

In the first example, <b></b> is a valid xml text inside another valid xml text <a></a>.

Hence total string is XML text

In the second example <b> has no matching pair and hence string is not valid xml text

### **Round 2 : Face to face (Skype- 1 hour)**

This was a DS+ Algorithm +coding round. They said there will be three DS+Algo rounds and it is necessary to pass any two of them , I passed the first two so they didn't take my third.

Q1- Given n ranges  $[a_1, b_1], [a_2, b_2], [a_3, b_3] \dots [a_n, b_n]$  where all the ranges lie between  $[0, 10^6]$ . All the entries are integers. Give total number of unique integers across all the ranges.

Example:

Input:

[1, 3]

[4, 9]

[3, 7]

output: 9

Here he insisted on making optimal code after my first approach, and approved the second one and asked me to code it. It has some good corner cases.

Q2 : Check if an array can be divided into pairs whose sum is divisible by k.

Input: arr[] = {92, 75, 65, 48, 45, 35}, k = 10

Output: True

We can divide array into (92, 48), (75, 65) and

(45, 35). Sum of all these pairs is a multiple of 10.

### Round 3: Face to Face (skype – 1 hour)

Also a DS Algo round. One question was asked in this round.

He asked to explain about graphs and dfs general questions and asked to explain dfs code and what are its applications. Then he gave me a question.

Q-You are given a tree .Each node can have any number of children not specific. Now we create a string of 0s and 1s .Firstly assume you are traversing in dfs so whenever you traverse a node you write append 1 in string traverse all its children and grandchildren, now when you again return to this particular node with all children traversed you append 0 to string and return further up . This way you have to string with whole traversal .

Example take a tree with a root, its two children and the left child has one more child. Its corresponding string will be 11100100.

Now the actual question is, given this string for a tree, firstly obtain this tree structure from this string and secondly identify whether this corresponding tree structure can have more than 1 string possible i.e other than the one given.

(Hint : DFS can be done in different ways depending on which child you traverse first. Also think on tree isomorphism, for all its sub children.)

I took time ,discussed every step with him, he was helpful and he asked me to make the code. I was able to do it, this interview lasted 80 mins.

### Round 4 : Tech Round (Skype – 45 mins)

This round consisted of OS, DBMS , Networks and basic computer fundamentals. We had a detailed discussion on all answers

Q1- about producer consumer process and all its conceptual details

Q2-solution of producer consumer problem, all the solutions(hardware and software) with explanation of all of the three conditions with examples(mutual exclusion, progress and bounded wait)

Q3-. It led to locks and semaphores. Asked me what is mutex locks and applications of locks and semaphores.

Q4- Process related one question, explaining for one program all its stages as a process and its processing (basically the new->ready->running etc).

Q5- What is swapper?Its working.

Q6- Dispatcher and functioning.

Q7- Thrashing and consequently then he went asking demand paging segementation.

Q8- What is HTTP? How is it a stateless protocol.

Q9- OSI model and its real life analogy if I knew any.

Q10- TCP/IP model and how is it different than OSI.

Q11- One SQL query ,I don't remember exactly, but it was on group by and had concepts of sub-query and join.

Q12- Asked me indexing, types and which data structure to use.I told Btrees, and asked to explain how and why it helps. He confused me with BSTs and asked although Time complexity will be same , then why Btree (I thought and discussed ,then came to conclusion about Disk writes)

### Round 5 -(overall -1:30 hours ,Skype)

This was taken by some big person sounded like senior manager/ED.

This was total tech+ds+algo+HR.

Q1-Asked me about my internship project in detail, about technologies used, how much I contributed etc.

Q2- Design a Localized Twitter, which shows the tweets of people within 2 miles of radius . Handling the cases

2.1-Everytime a person tweets (within 2 mile) it should appear on your page instantly, basically Pushing. (optimization of this was asked)

2.2-Design the database tables, show relationships between them, what attributes am I taking and why ?

2.3- Asked to write 2 queries about pulling data from Database.

2.4-Asked to optimize one query, I gave some methods about using joins and subqueries but he gave a hint of using indexing , so I used indexing (used Btrees for indexing – didn't write btree code, just concept)

Q3-Explained me a concept i.e given an array of size n, containing numbers from 1 to n, asked me to write an array containing the current numbers nearest number in its left ,which is smaller than current number.

Now question is given this (second one) array only, can you make the previous one? Asked me to code my logic.

Basic key is , you have to practice coding on online platforms as well as geeksforgeeks, and think before answering, take little time, think on all cases and ask for little help if stuck. Overall it was a good experience.

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

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi

## Directi Interview | Set 7 (Programming Questions)

An article containing recent Directi programming round questions in my campus placements and also those in my friends' colleges.

1) You are given a string S. Each character of S is either 'a', or 'b'. You wish to reverse exactly one sub-string of S such that the new string is lexicographically smaller than all the other strings that you can get by reversing exactly one sub-string.

For example, given 'abab', you may choose to reverse the substring 'ab' that starts from index 2 (0-based). This gives you the string 'abba'. But, if you choose to reverse the substring 'ba' starting from index 1, you will get 'aabb'. There is no way of getting a smaller string, hence reversing the substring in the range [1, 2] is optimal.

Input

First line contains a number T, the number of test cases.

Each test case contains a single string S. The characters of the string will be from the set { a, b }.

#### Output

For each test case, print two numbers separated by comma; for example "x,y" (without the quotes and without any additional whitespace). "x,y" describe the starting index (0-based) and ending index respectively of the substring that must be reversed in order to achieve the smallest lexicographical string. If there are multiple possible answers, print the one with the smallest 'x'. If there are still multiple answers possible, print the one with the smallest 'y'.

#### Constraints

1 <= T <= 100

1 <= length of S <= 1000

#### Sample Input

5

abab

abba

bbaa

aaaa

babaabba

#### Sample Output

1,2

1,3

0,3

0,0

0,4

2) Given two strings I and F, where I is the initial state and F is the final state. Each state will contain 'a','b' and only one empty slot represented by '\_'. Your task is to move from the initial state to final state with minimum number of operation.

Allowed operations are

1. You can swap empty character with any adjacent character. (For example 'aba\_ab' can be converted into 'ab\_aab' or 'abaa\_b').
2. You can swap empty character with next to adjacent character only if adjacent character is different from next to adjacent character. (For example 'aba\_ab' can be converted into 'a\_abab' or 'ababa\_'; but 'ab\_aab' cannot be converted to 'abaa\_b', because 'a' cannot jump over 'a').

#### Input

The first line contains single integer T – the number of test cases (less than 25). T test cases follow.

Each test case contains two string I and F in two different lines, where I is the initial state and F is the final state. I and F may be equal. Their length will always be equal. Their length will be at least 2. Their length will never be more than 20.

#### Output

For each test case output a single line containing the minimum number of steps required to reach the final state from the initial state. You can assume it is always possible to reach the final state from the initial state. You can assume that no answer is more than 30.

#### Example

##### Input:

2

a\_b

ab\_

aba\_a

\_baaa

##### Output:

1

2

3) A probabilistic preorder traversal is generated for a binary search tree from the following pseudo-code

```
function preorder(u) {
    if u is null then return
    print u.label
    r = either 0 or 1 with 50% probability
    if r == 0
        preorder(u.left_child)
        preorder(u.right_child)
    if r == 1
        preorder(u.right_child)
        preorder(u.left_child)
}
```

Given the preorder traversals of a binary search tree you can always uniquely construct the binary search tree. Since, the inorder traversal of a binary search tree is of course, the sorted list of labels.

Given one of the probabilistic preorder traversals of some binary search tree, print the number of different probabilistic preorder traversals that the above algorithm might generate. See the explanation section for clarity.

#### Input

The first line in input is equal to N, the number of test cases. Then follows the description of N test cases. The first line in each test case is the integer N, the number of nodes in the binary search tree. On the next line there are N integers – a probabilistic preorder traversal of the binary search tree. All the labels of the nodes in a test case will be distinct. The value of each label in a test case will be between 1 and N, inclusive. You may assume that the input will be a valid probabilistic preorder traversal of some binary search tree.

#### Output

For each test case, print a single number on a line by itself. This number should be the number of different probabilistic preorder traversals that exist for the binary search tree – including the one given in the test case. You may assume that the answer will always be less than or equal to 1,000,000,000. In fact, it is easy to see that

the answer can never be more than  $2^{30}$  (read to-the-power).

**Constraints**

$1 < T \leq 10000$   
 $1 \leq N \leq 30$

**Sample Input**

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

**Sample Output**

```
2  
1  
4
```

4) You are given a large array of 10,000,000 bits. Each bit is initially 0. You perform several operations of the type "Flip all the bits between start\_index and end\_index, inclusive". Given a sequence of several such operations, perform all the operations on the array. Finally, split the array into sets of 4 bits – first four, next four, then next four and so on. Each set can represent a hexadecimal integer. There will be exactly 2,500,000 hexadecimal integers. Calculate the frequency of each of the hexadecimal integers from '0' to 'f' among the 2,500,000 integers, and print it. See Input / Output and explanation of Sample Input / Output for clarity.

**Input**

The first line of input contains an integer  $T$  ( $1 \leq T \leq 10$ ), the number of test cases. Then follows the description of  $T$  test cases. You should assume that the array has exactly 10,000,000 bits and that the bits are all unset at the start of each test case. The first line of each test case contains an integer  $N$  ( $1 \leq N \leq 10,000$ ), the number of operations performed. The next  $N$  lines contain two integers separated by a space, the start\_index and end\_index for the respective operation. Note that the flip operation is performed from start\_index to end\_index, inclusive. Also, the array is 1-indexed – meaning, the smallest index is 1 and the largest index is 10,000,000.

**Output**

For each test case, output 16 integers on a single line, separated by single space characters. The first integer should represent the number of times 0 occurs among the 2,500,000 hexadecimal integers created according to the problem statement. The second integer should represent the number of times 1 occurs among the 2,500,000 hexadecimal integers created according to the problem statement, and so on.

**Constraints**

$1 \leq \text{start\_index} \leq \text{end\_index}$   
 $\text{start\_index} \leq \text{end\_index} \leq 10,000,000$

**Sample Input**

```
2  
2  
1 4  
9999997 10000000  
2  
3 6  
5 8
```

**Sample Output**

```
2499998 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2  
2499998 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0
```

5) You are given two strings, say A and B, of the same length, say  $N$ . You can swap  $A[i]$  and  $B[j]$  for all  $i$  between 1 and  $N$ , inclusive. You cannot swap two characters within A, or within B. Also, you can only swap a character in A with the character at the same index in B, and with no other character. You can perform this operation zero or more times.

You wish to modify the strings through the operations in such a way that the number of unique characters in the strings is small. In fact if  $n(A)$  is the number of unique characters in A and  $n(B)$  is the number of unique characters in B; you wish to perform the operations such that  $\max(n(A), n(B))$  is as small as possible.

Print the value of  $\max(n(A), n(B))$  after all the operations.

**Input**

The first line of input contains  $T$ , the number of test cases. Then follows the description of  $T$  test cases. Each test case contains the number  $N$  on the first line. The next two lines of the test case contain two  $N$  letter strings, A and B respectively. The letters are lowercase english letters.

**Output**

Print a single line for each test case. Print the value of  $\max(n(A), n(B))$  after all the operations are performed such that the value is as small as possible.

**Constraints**

$1 \leq T \leq 100$   
 $1 \leq \text{length}(A) \leq 16$   
 $\text{length}(B) = \text{length}(A)$

**Sample Input**

```
3  
7  
directi  
itcerid  
5  
ababa  
babab  
5  
abaaa
```

baabb

#### Sample Output

4

1

2

6) Let's define a string as an opening tag, where x is any small letter of the Latin alphabet.

Each opening tag matches a closing tag of the type , where x is the same letter.

Tags can be nested into each other i.e., one opening and closing tag pair can be located inside another pair.

Let's define the notion of a XML-text:

- 1) An empty string is a XML-text
- 2) If S is a XML-text, then " **S** " (quotes and spaces are for clarity) also is a XML-text, where a is any small Latin letter
- 3) If S1, S2 are XML-texts, then "S1 S2" (quotes and spaces are for clarity) also is a XML-text

You are given a string. You have to verify if the given string is a valid xml or not.

#### Input

First line contain T number of test cases

For each test case:

Only one line containing xml tagged string S.

#### Output

Print in one line a string TRUE if s is a valid xml FALSE if it is not.

#### Constraints

$0 < T \leq 10$

$0 < \text{length of } S \leq 10^5$

#### Example

##### Input:

2

##### Output:

TRUE

FALSE

7) In this problem we consider two stairways, A and B, which are parallel to each other. Both stairways, A and B, have N steps each where  $A[i]$ ,  $B[i]$  represent i-th step of A and B respectively.

Each step has some amount of penalty associated and if you use that step you will be penalized by the same amount. After taking few steps you will accumulate penalty of all of the steps you visited.

You have a maximum jump length of K i.e., from  $A[i]$  you can jump forward to  $A[i+1]$  or  $A[i+2]$  ... or  $A[i+K]$  without using any steps in between.

You can also jump across the stairways with an extra penalty P for changing stairways. For example from  $A[i]$  you can jump to  $B[i+1]$  or  $B[i+2]$  ... or  $B[i+K]$  with an additional penalty P along with the penalty of the step you visit. You can also jump from stairway B to stairway A and that too incurs an additional penalty P along with the penalty of the step you visit.

Observe that from each step you can jump forward only. Your final penalty will be penalty of all the steps you visited plus P times the number of times you crossed the stairways.

You can start from  $A[1]$  or  $B[1]$  and should reach  $A[N]$  or  $B[N]$  minimizing the penalty accumulated on the way. Find the minimum penalty you will accumulate.

#### Input

The fist line in input is equal to T, the number of test cases. Then follows the description of T test cases. The first line in each test case has three integers N, the number of steps in both stairways, K, maximum jump length, P, penalty for crossing the stairs. On the second line of each test case there are N integers where ith integer represents penalty of step  $A[i]$ . On the third line of each test there are N integers where ith integer represents penalty of step  $B[i]$ .

#### Output

For each test case, output a single line containing the minimum penalty you can accumulate on your path starting from {  $A[1]$  or  $B[1]$  } and ending on {  $A[N]$  or  $B[N]$  }.

#### Constraints

$1 \leq T \leq 10$

$1 \leq N \leq 1000$

$0 \leq P \leq 1000$

$1 \leq K \leq N$

$0 \leq A[i], B[i] \leq 1000$

#### Example

##### Input:

6

4 1 0

1 2 3 4

1 2 3 4

4 1 0

1 2 3 4

4 3 2 1

4 2 0

1 2 3 4

4 3 2 1

4 1 1 0

1 2 3 4

```
4 3 2 1  
4 2 1 0  
1 2 3 4  
4 3 2 1  
5 1 5 0  
0 0 1 0 2 1 0 4 0  
1 0 1 1 0 3 0 0 1 0 5
```

**Output:**

```
10  
6  
4  
10  
7  
100
```

**8)** In this problem we consider a rooted tree  $T_r$  with root  $r$  (not necessarily a binary tree). A dfs – depth first search – traversal of the tree  $T_r$  starting from root  $r$  , visits the nodes of  $T_r$  in a particular order. Let us call that order as dfs ordering.

Observe that during a dfs traversal , from each node we have choices between which child to traverse first.

These different choices lead to different dfs ordering. You have to find different ways a dfs can visit the nodes i.e., number of different ordering of nodes possible by a dfs on  $T_r$  starting from root  $r$ .

Consider an example  $T_r$  with 3 nodes labelled 1, 2, 3 with 1 as root and with 2 and 3 as children of 1.

A dfs on this  $T_r$  can visit nodes in ordering (1, 2, 3) or (1, 3, 2). Hence there are 2 ways of dfs ordering.

See sample test cases for more examples

**Input**

The fist line in input is equal to  $T$ , the number of test cases. Then follows the description of  $T$  test cases. The first line in each test case is the integer  $N$ , the number of nodes in the tree  $T_r$ . Each node is labelled with a distinct integer between 1 and  $N$  inclusive. On the next line there are  $N$  integers where  $i$ th interger represents parent label of node labelled  $i$  in rooted tree  $T_r$ . The value of each label in a test case will be between 1 and  $N$ , inclusive. Parent node of node labelled  $i$  will have label less than  $i$ . Node with label 1 is the root node  $r$ . Parent node of root node will be given as 0 in test cases.

**Output**

For each test case, output a single line containing number of different orderings possible by dfs on Tree  $T_r$ . Since this number can be huge output the value modulo 1,000,000,007.

**Constraints**

```
1 <= T <= 100  
1 <= N <= 1000  
0 <= A[i] < i
```

**Example****Input:**

```
6  
2  
0 1  
3  
0 1 1  
4  
0 1 1 1  
3  
0 1 2  
4  
0 1 1 2  
5  
0 1 1 2 2
```

**Output:**

```
1  
2  
6  
1  
2  
4
```

**9)** Katrina is a super geek. She likes to optimize things. Suppose she is at position (0,0) of a two dimensional grid containing ' $m$ ' rows and ' $n$ ' columns. She wants to reach the bottom right point of this grid traveling through as minimum number of cells as possible.

Each cell of the grid contains a positive integer, the positive integer defines the number of cells katrina can jump either in the right or the downward direction when she reaches that cell. She cannot move left or up.

You need to find the optimal path for katrina so that starting from top left position in the grid she reaches bottom right position in minimum number of hops.

**Input**

You are provided a template in which you have to implement one function minHops. The declaration of minHops looks like

**C / C++**

```
int minHops(int matrix[64][64], int m, int n)
```

**Java**

```
statuc int minHops(int[][] matrix, int m, int n)
```

#### Output

The function should return the minimum number of cells that should be touched to reach from top left corner of the grid to the bottom right corner (including touching both top left and the bottom right cells). Return 0 in case no path exists.

#### Example

Suppose the grid looks like this

```
2 4 2  
5 3 8  
1 1 1
```

Starting at A(0,0) contains '2' so you can either go to (0,2) or (2,0).

So following two paths exist to reach (2,2) from (0,0)

```
(0,0) => (0,2) => (2,2)  
(0,0) => (2,0) => (2,1) => (2,2)
```

Hence the output for this test case should be 3

#### Example 2

```
5 3 8 2  
6 4 2 1
```

There is no path from (0,0) to (1,3), so the output for this case should be 0

#### Example 3

```
2 3 2 1 4  
3 2 5 8 2  
1 1 2 2 1
```

Various paths in this case are

```
(0,0) => (0,2) => (2,2) => (2,4)  
(0,0) => (2,0) => (2,1) => (2,2) => (2,4)
```

So output in this case should be 4

**10)** Consider NewYork city which has grid like structure of houses. You are provided the city map in the form of a matrix. Each cell represents a building. From each building you can go to adjacent four buildings in four directions : east, west, north, south. Spiderman wants to rescue a victim which is on some building. You will be provided with the location of victim and spiderman is situated at (1,1) building. But, there is a condition that spiderman can not jump between buildings if the difference in their heights is greater than some particular value. Find a way for spiderman to reach the victim by crossing the minimum number of buildings.

#### Input

Input contains multiple test cases. First Line is a integer T, representing the number of test cases to follow.

First line of each test case has 4 numbers – M, N, X, Y, D. Here MxN is the dimension of the city grid. (X,Y) is location of victim.

This is followed by M lines. Each line consist of N space separated positive integers corresponding to building heights. D is the maximum difference between heights of buildings that spiderman can cross.

#### Output

One line for each test case containing a single integer, denoting the minimum number of buildings spiderman needs to cross. Return -1 if its not not possible.

#### Constraints

Should contain all the constraints on the input data that you may have. Format it like:

```
1 <= T, M, N, X, Y <= 100
```

```
1 <= D <= 100000
```

Each building height will be less than 100000

#### Example

##### Input:

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

##### Output:

```
3  
-1  
7
```

**12)** You are given a tree of N nodes. Each of the nodes will be numbered from 0 to N-1 and each node i is associated with a value vi.

Assume the tree is rooted at node 0.

A node y is said to be descendant of node x if x occurs in the path from node 0 to node y. A subtree rooted at node x is defined as set of all nodes which are descendants of x (including x).

A subtree is called univalued if the values of all the nodes in the subtree are equal.

Given the tree and values associated with nodes in the tree, you are required to find the number of univalued subtrees in the tree.

#### Input

The first line contains an integer N which is the number of nodes in the tree. The next N lines contain N integers representing the values associated with each node i.e ith line contains the value associated with node i-1. The next N-1 lines give the information of edges in the tree. Each line contains two space separated integers x and y denoting an edge between node x and node y.

#### Output

You have to print the number of univalued subtrees that are contained in the given tree.

Constraints

N<=30000

#### Example

##### Input:

```
5  
0  
0  
1  
1  
1  
0 1  
0 2  
2 3  
2 4
```

##### Output:

```
4
```

12) Directi organizes FNCS (Friday Night Chill Session) every once in a while (lots of FUN!). Directians comes and enjoy various events and then go out when they get tired and come back again when they are refreshed. For convinience, in/out of any person is recorded. At the end of the day, The organizer wonders what the maximum number of persons was during the event. So he ask for your help. He gives the entry and exit time of each person like this:

Person	Entry_time	Exit_time
#1	6	10
#2	1	7
#3	1	4
#4	8	10
#5	6	10

The identity of the person does not matter. #1 and #4 may be the same person. In this case, maximum number of persons present during the event at any time is 3.

Your task is to read the entries and compute the max number of persons present during the course of event.

#### Input

Input contains multiple test cases. First Line is a integer T, representing the number of test cases to follow. First line of each test case is a number N, number of entry-exit records. This is followed by N lines. Each line consist of two space separated integers corresponding to entry time and exit time of a person.

#### Output

One line for each test case containing a single integer, denoting the maximum number of persons present at the party at any time.

Constraints

1 <= T <= 100

1 <= N <= 100

1 <= ENTRY\_TIME < EXIT\_TIME <= 10000000

The entry and exit time of the persons are guaranteed to be distinct

#### Example

##### Input:

```
1  
6  
7 8  
4 9  
6 9  
8 17  
2 14  
2 10
```

##### Output:

```
5
```

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## GATE CS Corner Company Wise Coding Practice

# Directi Interview | Set 6 (On-Campus for Internship)

Recently Directi visited our campus for intern selections. There was 1 Online coding round hosted on codechef, 2 Algo Interview round and 1 Technical round.

## Online Coding round:

There were 2 questions. Question 1 had 2 points whereas question 2 had 1 point.

Question 1. There is a compressed string eg. "ab2c3", the string has lowercase characters and numbers. We can uncompress the given string as follows: whenever we get a number "n" in the string, the portion of the string before the number will repeat "n" times. So in the above example, we get a 2, so string will become "ababc3", now we get a 3, so final string will be "ababcababcababc".

Given a compressed string and a number k, you have to output the k'th character in the uncompressed string.

1 <= length of string <= 1500 1 <= n <= 1000 1 <= k < 2^31 example: input: ab2c3 10 output: c Question 2. There is a string whose characters can only be either 'a', 'b' or '\_' (there can be only one '\_' in the string). At each step, we can modify the string as follows: 1. '\_' can be swapped with its adjacent character, example "a\_ba" can be changed to either "\_aba" or "ab\_a". 2. Two characters adjacent to '\_' (both on the same side of '\_') can be reversed along with the '\_' if both characters are different, example, "aa\_ba" can be changed to "aab\_" but not to "\_aaba" because both characters are 'a'. You are given two strings, the initial state and the final state (lengths will be same), you have to output the minimum number of steps required to change the string in initial state to the string in the final state. example: input: a\_b ab\_output: 1 input: abaa\_a b\_aaaa output: 4 reason for example 2:- abaa\_a -> aba\_aa -> ab\_aaa -> \_baaaa -> b\_aaaa

Hint: Use Breadth first search

They shortlisted 12 students after this contest for the next round.

## Round 2 (Telephonic interview):

Question 1. Suppose you are given a string of length n and a set of pairs(i, j such that 0 <= i < j < n). Pair "i, j" (0 based indexing) means that you can swap the i'th and j'th character in the string any number of times. You have to output the lexicographically smallest string that can be produced by doing any number of swaps on the input string. example:

```
input: zcxfb  
0, 1 0, 2 3, 5  
output: cxzebf
```

**Hint:** Try to model the problem to a graph problem.

Question 2. Suppose there are two piles of plates in the table. One has 'm' RED plates and other has 'n' BLACK plates. In his/her chance, a player can either pick any number of red plates or any number black plates or equal number of red and black plates. A player loses if he cannot make a move in his/her chance. You are playing this game with your friend. Given that you begin the game and both the players play optimally, output 'L' if you will lose or 'W' if you will win.

example:

input: m = 1, n = 2

output: L

input: m = 2, n = 2

output: W

After this round, they selected 4 people for the next round of interview.

## Round 3 (face to face):

Question 1. Suppose there are 'n' trees (literal trees, not trees of computer science, suppose they don't have any branch, more like a straight stick), each of them have some height. We want x length of wood. We have a woodcutter, which we will use to cut all the trees at the same height 'h' from ground, if 'h' is greater than the height of any tree, means that tree is not cut. Given the heights of all the trees and length 'x' of wood required, output the height 'h' from ground from where you will cut all the trees.

Question 2. You have an undirected weighted graph, given input 'x' and 'y', which are any two vertices of the graph, you have to output all the edges that are in any of the shortest path from x to y.

Note that there can be multiple shortest path from x to y. We have to output all the edges in any of those shortest paths.

They selected only 1 student for next round.

## Round 4 (Technical round, telephonic):

In this round, he asked me small questions which included:

1. About any of my self-projects.
2. Advantages and disadvantages of BST and hashing. Questions related to collisions in hashing etc.
3. A question related to databases, he asked me to make a query.
4. Formulate the angle between the hour hand and minute hand of the clock for any given time.
5. Suppose we have a huge CSV file having ip-address ranges and its corresponding country code, given any ip-address how will we find the country which it belongs to.
6. Difference between BST and tries.
7. He asked few questions from Network course and OS course.
8. You have a huge linked list, how will you detect any loop in the linked list.

He asked few more small questions which I don't remember, after which the interview ended.

I got selected after clearing all these rounds.

## Tips:

1. There main focus was on string and graph, prepare well for them.
2. Practice your codes on paper or google doc, you will not get any editor for coding.
3. Keep your concepts clear on all the topics, they can ask you about any minute detail of any data structure or algorithm.

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## Directi Interview | Set 5 (On-Campus)

There was 1 online coding round, followed by interviews. Online coding round was on Codechef.

### Online round:

There were 2 questions.

Question 1: A string can contain only a, b or c. There cannot be 2 consecutive same character. First and last character cannot be same. Now given a string with 'a', 'b', 'c' or '?'. We need to find the string replacing '?' that satisfy the above conditions. For multiple answer display lexicographically smallest string. For no answer possible display "Not Possible".

### Round 2 (Telephonic):

Question 1. We need to make a string of size n. Each character of the string is either 'R', 'B' or 'G'. In the final string there needs to be at least r number of 'R', at least b number of 'B' and at least g number of 'G' (such that  $r + g + b = n$ , No. of 'G'  $\geq 1$ , No. of 'B'  $\geq 1$  and (No. of 'R') + (No. of 'B') + (No. of 'G') = n) then following cases are possible:

1. RBGR and its 12 permutation
2. RBGB and its 12 permutation
3. RBGG and its 12 permutation

hence answer is 36.

Question 2. There is a rectangle with left bottom as (0, 0) and right up as (x, y). There are n circles such that their centers are inside the rectangle. Radius of each circle is r. Now we need to find out if it is possible that we can move from (0, 0) to (x, y) without touching the circle. We can move freely anywhere.

### Round 3(Face to Face):

Question 1. There is a binary tree. We are given 3 nodes a, b and c. We need to find a node in the tree such that we remove all edge from that node we get a, b and c in three different trees.

Question 2. Given an array and an integer T. We need to find a subarray from  $i, i+1, i+2, \dots, j$  such that  $|a[i] + a[i+1] + \dots + a[j] - T|$  is minimum.

I was rejected in this round. But latter got placed in flipkart.

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## GATE CS Corner Company Wise Coding Practice

## Directi Interview Questions

I took Coding Round 1 of Direct I campus recruitment today . Sharing the 2 questions which have been asked.

### Question 1 (Optimal substring reversal):

You are given a string S. Each character of S is either 'a', or 'b'. You wish to reverse exactly one sub-string of S such that the new string is lexicographically smaller than all the other strings that you can get by reversing exactly one sub-string.

For example, given 'abab', you may choose to reverse the substring 'ab' that starts from index 2 (0-based). This gives you the string 'abba'. But, if you choose to reverse the substring 'ba' starting from index 1, you will get 'aabb'. There is no way of getting a smaller string, hence reversing the substring in the range [1, 2] is optimal.

#### Input:

First line contains a number T, the number of test cases.

Each test case contains a single string S. The characters of the string will be from the set { a, b }.

#### Output:

For each test case, print two numbers separated by comma; for example "x,y" (without the quotes and without any additional whitespace). "x,y" describe the starting index (0-based) and ending index respectively of the substring that must be reversed in order to achieve the smallest lexicographical string. If there are multiple possible answers, print the one with the smallest 'x'. If there are still multiple answers possible, print the one with the smallest 'y'.

#### Constraints:

1  $\leq$  T  $\leq$  100

1  $\leq$  length of S  $\leq$  1000

#### Sample Input:

```
5
abab
abba
bbaa
aaaa
babaabba
```

#### Sample Output:

```
1,2
1,3
0,3
0,0
0,4
```

**Attention:**

The constraints are designed such that an  $O(N^3)$  algorithm per test case, would not pass.

**Question 2 (Database Queries): 2 points**

You have a set of N objects. Each of these objects have certain properties associated with them. A property is represented by a (key, value) pair. For example, assume you have the following two objects.

```
Tower:  
{  
    (height, 100), (weight, 50),  
    (xposition, 25), (yposition, 36)  
}
```

```
Tree:  
{  
    (area, 100), (noofleaves, 500),  
    (height, 25), (yposition, 36)  
}
```

Each object you have, will have at most 4 properties. An object will have at least 1 property. Note, from the two objects above, that it is not necessary for key in the properties to be same for all the objects. Also, it is not necessary for the key to be different.

Now, given N such objects, you wish to answer M queries. Each query is represented by a set of properties (again, at most 4 properties, and at least 1 property). The answer for the query is the number of objects in the set, that have all the given properties. Two properties are considered equal iff both the key and the value match.

For example, if you have the above two objects, then the answer for the following queries is

*Query:* { (height, 100), (yposition, 36) }

*Answer:* 1 // matches Tower, but not Tree

*Query:* { (yposition, 36) }

*Answer:* 2 // matches both Tower and Tree

*Query:* { (height, 100), (noofleaves, 500) }

*Answer:* 0 // neither Tower, nor Tree satisfy both properties

**Input:**

The first line of input contains N and M. This is followed by the description of the N objects. The description of the i-th object will start by a number k, which is the number of properties associated with the object. The next k lines contain two space separated strings – the property key and the property value. Note that the property value is not necessarily an integer (although this is so for the example above).

This is followed by the description of M queries. The format of a query will be exactly same to that of the objects. Check the Sample Input for clarification.

One test file will contain only one test case. A single test case may contain several queries.

**Output:**

Print M lines. Each line must be the answer of the respective query.

**Constraints:**

```
1 ? N ? 10000  
1 ? M ? 100000  
1 ? k ? 4
```

**Sample Input**

```
2 3  
4  
height 100a  
weight 50b  
xposition 25a  
yposition 36b  
  
4  
area 100a  
noofleaves 500  
height 25  
yposition 36b  
  
3  
weight 80  
xposition 25a  
yposition 36b  
  
1  
yposition 36b  
  
2  
xposition 25a  
yposition 36b
```

**Sample Output:**

```
0  
2  
1
```

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## Directi Interview | Set 3

### Online round:

1. There exist a binary tree with each node containing a character (lower case letters for leaf nodes and upper case letters for non-leaf nodes) and exactly two child, Now given a string find the number of root to leaf paths that contain this string as its subsequence. And the binary tree is given in post order notation.
2. A long question and a brute force solution of finding the most optimum subset ( $2^n$ )

### First Round-

1. Find the k root of a number n. Mention the special cases, if any.
2. Given a connected graph with  $n-1+k$  edges and k being less than 10. Convert this graph to a tree removing the most weighted set of edges.
3. Given a set of coins n with each coin i having  $P_i$  probability to give heads. Find the probability of getting k heads, when all coins are tossed together.

### Second Round-

1. Given a random function which gives some value in the range [-1,1]. Find the value of PIE.
2. Given a set of currencies and the exchange rates from each currency to another. Find if there exist any cycle of exchanges after which the original value of the amount increases.
3. Given a tree find the maximal XOR of any path from root to leaf (simple recursion)
4. Given a tree find the maximal subset XOR of any path from root to leaf. (ie the subset XOR may or may not include all elements from root to leaf)

### Third round-

Some HR questions especially regarding the projects done by you and only one algorithmic question-

1. Given a set of restaurants (the number being quite large) and its geographical location( $x,y$ ) , you are allowed to do an significant amount of pre-processing on it. Now suppose there are x customers located at position (s,t), design an efficient algorithm to find the k nearest restaurants to these customers.  
( This problem is the famous KNN problem- the solution they were expecting were of grid files )

Please do comment in case of doubts and queries.

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## GATE CS Corner Company Wise Coding Practice

## Directi Interview | Set 2

There was 1 online coding round, followed by interviews.

Online coding round was on Codechef.

**1st question** Sandeep and Pali want to go on holiday. Their parents have given them a list of cities they can visit. A list may contain a city more than once. Both of them want to go to places of their parents choice. As they want to travel together, they have to agree upon a common route. No one wants to change the order of the cities on his list or add other cities. Therefore they have no choice but to remove some cities from the list. Of course the common route is to involve as much sightseeing in cities as possible. There are exactly 26 cities in the region. Therefore they are encoded on the lists as lower case letters from 'a' to 'z'.

Input:

```
1
abcabcaa
acbaba
```

Output:

```
5
[question is similar to LCS ]
```

### Interview Round 1

He asked me two questions

1. You are given two array, first array contain integer which represent heights of persons and second array contain how many persons in front of him are standing who are greater than him in term of height and forming a queue. Ex

A: 3 2 1

B: 0 1 1

It means in front of person of height 3 there is no person standing, person of height 2 there is one person in front of him who has greater height then he, similar to person of height 1. Your task to arrange them

Output should be.

3 1 2

2. Your are given an array of integers and an integer k of window size, you need to find minimum value in this window.

Ex. A: 1 2 3 4 5 6 and k = 3

Then output will be: 1 2 3 4

This question is similar to [Maximum of all subarrays of size k](#)

This article is compiled by **Nitin Gupta**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Directi  
Interview Experience

### Directi Interview | Set 1

#### Written Round:

- 1) Given a binary tree, such that each node contains a number. Find the maximum possible sum in going from one leaf node to another.
- 2) Suppose you have some guests arriving at a party. For each guest, you are given the arrival and departure time. When a guest arrives he is given a wine glass and when he leaves he returns that wine glass (it becomes available to be given to another guest). Find the minimum number of wine glasses needed to serve all the guests. The arrival and departure team can only be between 1800 to 2359 hours.

#### Interview

##### Round 1:

- 1) Suppose you have strings like A, B..., Z, AA, AB, ....AZ and so on. This is similar to the way the columns of excel are named. Given a number you have to find the corresponding string. (e.g. 27 would map to AA). I had to give the algorithm and write the pseudo code for this.
- 2) Given n biased coins, with each coin giving heads with probability  $P_i$ , find the probability that on tossing the n coins I will obtain exactly k heads. I had to write the formula for this (i.e. the expression that would give us  $P(n, k)$ ).
- 3) Given n positive real numbers, find whether there exists a triplet among this set such that, the sum of the triplet is in the range (1, 2). Do it in linear time and  $O(1)$  space.

##### Round 2:

- 1) Suppose we have three positive integers A, B, C. We randomly choose an integer a in the range [0,A] and an integer b in the range [0,B]. Find the probability that  $a + b \geq C$
- 2) Repeat the above problem for the case when A, B, C are three positive real numbers.
- 3) Given a regular expression and a string (that apart from characters only contains \*). Find whether the string satisfies the regular expression. Once the initial solution was given, a good amount of time was spent in considering all possible edge cases and tweaking the algorithm to solve those edge cases.

#### Round 3: Telephonic Interview

The length and breadth of my knowledge regarding Databases, networks and data structures was tested. Some of the questions asked were:

What are relationships? How are they represented in a database?

What is indexing? Explain it with an example.

What is a hash table?

What is an IP address?

What is a MAC address?

If a MAC address exists why do we need an IP address?

Give the use cases of binary tree?

What is the advantage of an M-ary tree over binary tree?

Given the different prices of a stock over a time period, find the maximum profit that a person can make by buying and selling the stock within the given time period. The number of such entries can run into millions, so time complexity is important. E.g. the prices are 70, 60, 100, 150, 110. The maximum possible profit in this case is (150-60=90).

This was the end of the telephonic interview. Probably he was in two minds after this because I was called again after 10 minutes, and two quick questions were asked:

How can I contribute to Directi?

What exactly did I do in my internship and how did I benefit my team?

The response to these two questions sealed the deal and I was 'hired' by Directi.

#### Interview advice:

- . College students spend majority of their time doing problems related to data structures and algorithms. However most of students ignore the other core CS subjects. You MUST devote equal time to these subjects, because almost all companies require you to possess a solid understanding of the basic fundamentals of Operating Systems, Databases, Networks, Classes (depending on the profile they are hiring you for).
- . The way you express yourself is really important. If you are unable to express yourself clearly or lack enthusiasm organizations would see that as a potential red flag. If you are weak in English, practice speaking in front of a mirror (believe me, it helps) or still better give mock interviews to your friends.
- . Think out aloud. Whatever idea comes to your mind, share it with the interviewer. Always start by giving a brute force solution to the problem (it helps the interviewer know that you have understood the problem).
- . Don't give up on a problem until the last moment. Keep on discussing things with the interviewer; he will give you hints if you are on the right path.
- . Keep solving problems on GeeksforGeeks!

This article is compiled by Vikram Goyal. Many Many congratulations to Vikram for his selection in Directi. If you like GeeksforGeeks and would like to contribute, you

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Direct  
Interview Experience

### Works Applications Interview Experience | Set 3

To get your interviews with Works Applications, you need to solve a set of questions within a stipulated amount of time. One thing to remember is that you are competing against the whole of India, and hence your programs should run as fast as possible, even in the worst case. As far as I'm concerned, this is the hardest stage to clear. Once you have cleared that, you shall be called for interviews. You shall have the option to pick your location and date of interviews.

You shall have two 45 minutes technical interviews, one 50 minutes written aptitude round and one HR round. The process shall start with the first technical interview. Make sure that you have some projects or experience on your resume, so that there is something to speak about in the initial stage of the interview. Your grades don't matter here, just your code chops. Once that introduction stage is past, the interviewer shall give you your first question. This is a live coding round, meaning that you need to code your solution on a computer. The interviewer shall be watching every line that you type through another computer. Though you can choose your language to code in, they prefer Java. The question can be a modification of your solution that you submitted online, in which case, code it in the language that you had submitted. You may also be given another question too. Just make sure that you code it all well and quick.

If you clear that interview, you shall be called for the second interview, which is again another live coding round. Another thing to note is that your interviewers shall in all probability be Japanese. If you have any problem with their accent, please say so. My interviewers were some of the nicest interviewers I had ever come across! Some of them are even familiar with some of the languages in India!

If you clear both these interviews, you now stand a good chance to get selected. If you are strong with your mathematical fundamentals, you can easily clear the written round. Once you do that, you shall be called for the HR interview. I have heard people mentioning that HR round is a mere formality, but I have seen people getting rejected at this stage. So prepare well for this round too. Research the company well, understand what they are doing, what their products are, and about their work culture. Don't just jump ship just because of their package. If you clear this interview, you shall be leaving the room with the signed offer letter in your hand! Good luck!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Works Applications Japan

### Works Applications Interview Experience | Set 2

Here is the hiring process they followed (in my case):

**Round-1:** (Online Coding Round)

**Question-1:**

**Abstract**

An orienteering map is to be given in the following format.

```
#####  
#@...G#  
##.##@##  
#.@@..$#  
#@....#  
#####
```

Calculate the minimum distance from the start(S) to the goal(G) with passing all the checkpoints(@).

**Specification**

'.' means an opened-block that players can pass.

'#' means a closed-block that players cannot pass.

It is allowed to move only by one step vertically or horizontally.

$1 \leq \text{width} \leq 100, 1 \leq \text{height} \leq 100$

The maximum number of checkpoints is 18.

Return -1 if given arguments do not satisfy specifications, or players cannot arrive at the goal from the start by passing all the checkpoints.

**Input**

The input is to be given in the following format, from the standard input.

```
W H  
Row1  
Row2  
...  
RowH
```

The first row is to describe the width and the height of the orienteering map, sectioned by a space.

**Output**

Output into the standard output, and put a return.

**Question-2:**

Implement a Immutable Queue in Java.

In both of these question Code skeleton was provided.

## Round-2: (Interview)

After this, we had to select our location and dates of the interview also.

It was 13th September and we went there for the interview. Interview was further taken in 4 different rounds.

1. [Live Coding](#) – In this round the interviewer asked to optimize and code the first problem in the given assignment and print the complete path from source to goal in 45-60 min.

2. [Aptitude](#) – 30 MCQs from P&C, Probability, Contribution, Profit – Loss, Time and Work etc. to be done in 1 hour.

3. [Live Coding & Technical Discussion](#) – In this round an engineer discussed the technologies I have worked on and then gave me another problem to code. It was to print all the permutations of a string in sorted order. He gave me a software designing problem and asked me how will you proceed with that and what ideas are you proposing for that kind of a design? And then he asked me about my internship experience with Oracle and what work I was doing that time.

4. [H.R. –](#)

Not to mention but it was the best round among all. She asked me some usual questions like how their interview process was, the differences I found in the process, why I want to work with them, how I fit in their organization.

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## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
[Works Applications Japan](#)

## Works Applications Interview Experience | Set 1 (Japan)

At 8:30 AM on 17th Dec., I heard my name from the recruiter, and that was the starting of a long technical interview. I was the first one to be called for the interview. The interview was a live-coding interview, where I needed to code on Eclipse, and that coding practice was to be seen by the recruiter on the other computer connected with mine. To mention, Recruiter was very nice in nature, and very fresh (as it was the first interview, that day) at that time. He started asking me about my programming and technical interests. I told him that I love to do programming in C and Java, ad DS and OS are my favorite subjects. Then he asked me, the very first code, it was just a modification to be made to the programming assignment which I had submitted during the All India IT Talent Contest. Then he asked for one more modification. Modifications were to add two more functions of finding least 10% elements at any time in the Data-Structure and to reverse the Data-Structure at any time. Then, he given me a fresh program to check, whether a given string is a sub-string of another given string. Firstly I suggested normal  $O(m*n)$  solution and then he told me to optimize it. Thanks to geeksforgeeks that I studied, KMP algorithm of pattern matching there and re-modified the code to  $O(m+n)$  complexity. The he asked me a problem about segregating zeroes and ones in an array. Then one problem was related to reduction of strings (consisting of a, b & c) & by replacing two chars with the third one. Then he asked me a program on finding longest monotonically increasing sub-sequence in an array. Again thanks to geeksforgeeks that I solved it in the normal fashion followed by the Dynamic Programming solution. Then he asked me to print all such sub-sequences possible, not only the first one. Then he asked me for making changes to the code, considering the fact that input-values are Hexadecimal string not the Decimal values. I was not known to any predefined functions capable of converting Hexadecimal string to Decimal value. So I wrote my own HexToDec and DecToHex functions, and thus completed all the changes suggested by the recruiter. Finally due to my good performance in the interview, recruiter was very happy regarding this. He congratulated me for this & wished me best of luck for the next round.

Next round of interview was more about the basics of CSE. He asked me many questions from OS (semaphores, process, deadlock, virtual memory etc.), one question about B Tree and B+ Tree and some questions from multi-tier & client-server architectures. This round also went nicely. Then there was an aptitude test consisting of questions from Logical Reasoning, Data Interpretation, Probability, P&C and simple Quantitative Maths. It was an average test, so I attempted almost all questions. Generally all the people who reach to this round, clear it, as only some people clear those tough technical interviews.

Finally I reached to the HR interview, where interviewer asked me many questions about my areas of interest, thinking behind relocation to some other country, family background and about my teaching interest to The Enlightenment club members of NIT Agartala. Finally, after considering performance in each round, She offered me a position of R&D Engineer at Works Applications Co., Ltd. I thank her for offering such a lucrative offer. Then, she told me more about the company and its working environment through her presentation.

I thank Works Applications Co., Ltd., geeksforgeeks, T&P Cell, my parents, my didi, my teachers, my department, my institute NIT Agartala & my dear friends for all their guidance and blessings so that I could get such a nice placement. At the end I should say that "where there's a will there's a way".

Thanks for your time!

This article is compiled by **Saurabh Jain**. Many Many congratulations to Saurabh 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.

## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
[Interview Experience](#)  
[Works Applications Japan](#)

## Adobe Interview Experience | Set 42 (Off-Campus)

Recently i was interviewed at Adobe(off-campus) Software-Engineer position and got placed. I would like to thank the whole GeeksforGeeks team for providing such a great platform for preparing interviews. Below is a detailed description of all the rounds.

**1st Round(Online)** : Aptitude Test:45 minutes(Objective Only). Technology Test:C/C++ or Java(only one)(Objective+Subjective) 45 minutes.The questions were easy in both aptitude and technology test.Platform was hackerrank. Coding questions included :binary to decimal,generating a unique set of numbers in a given range every time etc.The output questions were of medium difficulty.Just manage your time for this round.It is easy to clear.

Face To Face :

Well after around 15-20 days, I got a mail that I have been selected for the face to face rounds.

1st: Started with introduction. The interviewer was very cool. After sometime, he started with questions.

i). Given a string, print all the sub-strings that are palindrome.

ii). OS: Explain Deadlock and Virtual memory.

iii). Implement Virtual Memory (by code).

iv). A scenario: Suppose you have: browser -> cache -> database model. Now, suppose a bug fix has been done on this model. After bug fixing, it has been found that a request -> response that earlier took 1ms now takes 25 ms. How will you identify what is wrong with the model and in which part?

2nd: Again started with a bit of intro... Then onto questions..

i). Binary To Hexadecimal. (Directly).

ii).

**Input N=4**

**Output :**

```
4444444  
4333334  
4322234  
4321234  
4322234  
4333334  
4444444
```

**Input N=3**

**output :**

```
33333  
32223  
32123  
32223  
33333
```

**Generalize and write code.**

iii). Asked about Adobe products. Discussed for some time about Adobe CC.

Well I was a bit nervous after this round. I had to wait more than 2 hours. After that my 3rd round began

3rd: Directly went to questions.

i). <http://quiz.geeksforgeeks.org/puzzle-11-1000-coins-and-10-bags/>. (Was asked the optimal solution).

ii). Zig Zag Level Order Traversal: <http://www.geeksforgeeks.org/level-order-traversal-in-spiral-form/>

iii). <http://quiz.geeksforgeeks.org/puzzle-gold-or-silver/> (Replaced gold and silver with apples and oranges).

iv). Loop Linked-List: <http://www.geeksforgeeks.org/detect-and-remove-loop-in-a-linked-list/>

v). What is host file in windows?

vi). What is loopback address and its significance?

vii). What is windows registry?

viii). Difference between 32-bit and 64-bit windows.

Well after this round I was told to go home for that day. I feared being rejected but all was well as I was again called the next day for the 4th and final round.?

4th: The interviewer was the senior most of all.

He started off with my intro. Then moved onto my projects. He told me to describe one of my project and was pleased. He then asked me about what practical usage of my project is and some other questions from my other projects. Then he gave lots of scenarios:

i). Wireless keyboard not working. Give possible reasons..

ii). Adobe Photoshop Blurring Effect: Tell what type of image you will take to ascertain that Blur Effect happens actually or not..

iii). Improve Uber/Ola by adding one missing feature. (at least)

iv). Improve Whatsapp by adding one missing feature again..

Asked about why I want to leave my current organization. What my plan for future? And last of all -> Any questions?

After 1 week I got a confirmation call that I have selected for Adobe. I am really overjoyed and I would like to give credit to my friend (with whom I do coding) and geeksforgeeks for my achievement.

Those who are preparing for interviews, I would like to advise them.

a). Be focused, try to grasp in one go any question.

b). Don't hurry and give wrong answers. Instead take time (not too much) and give correct answer.

And last of all prepare from geeksforgeeks. It is such a platform that will help you in coding and other topics. Apart from that for coding, do interviewbit, hackerrank..

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## GATE CS Corner Company Wise Coding Practice

# Adobe Interview Experience | Set 41 (For Software Engineer)

## First Technical Round

1: Given NXN matrix filled with 1,0,2,3.

1(Source)

2(Destination)

3(Blank cell)

0(wall)

Write a code to identify whether there is a path possible from source to destination, traversing through blank cells only. You can traverse up, down, right and left.

2: In above question calculate the minimum number of moves needed to move from source to destination.

3: Given a binary tree , print all the nodes in a same horizontal distance from root in a zig-zag manner.

suppose the data in same horizontal distance is

1 5 6 (horizontal distance 0)

3 11 13 14 (horizontal distance +1)

2 9 10 12 (horizontal distance -1)

4 (horizontal distance 2)

7 (horizontal distance -2)

8 (horizontal distance 3)

15 (horizontal distance -3)

op will be 8 4 12 10 9 21 5 6 14 13 11 3 7 4 15 8.

4: Test cases on fb login page.

5: To detect and remove Loop in a link list.

## Technical Round 2

1: There is a Queen placed in 8X8 chess board, a x,y coordinate is given, u have to find out is it possible to put other queen and so on for 8 queens.

2: Test cases on a smart phone going to be launched tomorrow.(Discussion of about 40 minutes)

3: Is testing your smartphone under refrigerator and microwave oven is valid test scenario?

## Technical Round 3

1: You have given 3 rows 5 column matrix. Rows will be filled with platforms like ios,windows,android and columns would be features like camera,music system,Internet,voice,Locking system.

i have to filled the matrix by yes or no for the combinations of rows and columns for my smartform going to launch tomorrow on this different platforms and having updates on this feature.what would be my stratergy of testing as i have onl one day.And i have to launch the smartphone tomorrow any how.

2: SDLC life cycle phases. He is a customer and i am a road contractor. He will be stating me that he will need a road from this city to some list of cities.I have to fill the details on different phases.

3: Mis-labelled jar puzzle.

4: Mis-labelled jar puzzle for 4 jars.

## Technical Round 4

1: Difference between severity and priority.

2: Given scenerios i have to mark with appropriate level of severity and prioity.

3: 2 ropes and 45 min puzzle.

4: 25 horses puzzle.

5: Discussion on some OS concepts.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

# Adobe Interview Experience | Set 40 (On-Campus for MTS-1)

## Online test:

Coding : Time : 90 minutes

There were three coding questions as follows:

i > A man starts from his house with a few pan cakes. let they be N. Now he visits K places before reaching home. At each place he can buy a cake, sell a cake or do nothing. But he must sell L cakes before reaching home.Find the maximum number of cakes he can have at any point in his journey.N,K,L are given as input  
ex: for 5 3 1 , output: 7

ii > The exact question i don't remember. You have to find the maximum contiguous subarray in an array. Basically a question on Kadane's algorithm

iii > There is a text. There is a pattern. The pattern contains a \* symbol and it can be replaced by 0 or more letters(any letter) . For example if the pattern in aa\*b the aaab, aab,aacb,etc all are valid patterns.You have to find number of occurrences of the pattern in the text.

MCQ: 50 minutes

There were 45 questions based on logical reasoning, data interpretation and elementary mathematics. One advice is that start from the end, they are much easier than those in the beginning.

About 16 students were selected for interviews.

#### **Round 1**

The interviewer looked at my resume. Then directly moved to Data Structures and Algorithm.

1> He asked me about sorting algorithms.Then he asked me what is the difference between quick sort and merge sort and when to use what?

I told him merge sort is stable and quick sort has a worst case complexity of  $O(n^2)$  but in quick sort we don't need to merge sorted array. In case of arrays we use Quicksort and for linked lists we use merge sort

2 > Write code for merge sort of a linked list containing floats

3> He then told me about bubble sort in linked lists by swapping of data in nodes and asked what is the problem here apart from complexity?

I told that linked lists generally contain chunks of data so swapping data can cause considerable overheads and degrade performance. He seemed happy with the answer.

4 > How is a float like 5.7 represented internally in the CPU?

I had to tell about IEEE notations. I didn't remember those so could not answer it.

5 > Few questions on Operating Systems , Threads, Process, their difference , paging, etc

6 > You have to write a generic Compare function for sorting. For example, suppose there is a Student class containing marks of Subjects X,Y,Z. you have to write a compare function for sorting based on any field that the user wishes.

Hint:Use Function pointer

7 > Two numbers are given you have to multiply them without using \* operator and also tell the minimum number of additions required to do so.

i gave an also but could not tell the minimum number of additions required.

#### **Round 2**

Again the interviewer looked at my resume and told i have done a good number of projects. But again no questions on my projects.

1 > Design a Cache for storing any kind of data.

As we do not know what data is to be stored , so we must return void pointers. Now first i implemented with an array. Then for page replacement i used LRU. For keeping track of least recently used element, i used a heap. I was told to further optimise it . So First represented the cache a heap then finally went ahead with a Doubly Linked List with addresses of nodes stored in a HashMap.Wrote codes for set and get functions for the cache and replacement also.

The interviewer helped a lot and pushed me towards correct solution

2 > A C code was given and i was asked to find the error. It was a tough one involving pointers and character alignment within the memory space and segmentation faults.

3 > A few questions on function overloading

4 > The arrival time and departure times of trains are given, you have to find the minimum number of platforms required for the trains.

#### **Round 3**

In this round, my internship project was discussed in details. Then the following questions were asked:

1 > What happens when we often allocate and deallocate memory?

There was a long discussion on how the OS allocates memory, fragmentations , how to avoid it (compaction).

2 > how compaction works? he was asking for algo

Told him that memory blocks can be represented by 0(free) and 1(occupied). Compaction would then mean moving all the 0s in the end. I told him the respective algo for array and linkedlist.

3 > how deallocation occurs and what things should be taken care of during deallocation?

I told him that instead of frequently allocating and deallocating memory, we can reuse it using realloc(). There were a few questions on realloc().

4 > Why row major traversal of a very big array is faster than column major traversal?

Told him the benefits it can have from internal caching

5 > You have to cover a distance N. You can take 1,2 or 3 steps. Find number of ways of doing so.

Gave both the recursive and dp solution.

#### **Round 4(Final HR round)**

This was basically an HR round and questions like Why adobe? If you get another job, how will you decide which one to accept ? What is your location preference ? etc were asked.

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## **GATE CS Corner Company Wise Coding Practice**

# Adobe Interview Experience | Set 39 (1.5 Years Experienced)

Test Procedure: (Prior to interview date)

1. Online Written test.

Time: 1:30 hrs

Questions: 25(5- coding, 20- MCQ)

MCQs were aptitude, Operating systems and output questions

Coding were simple array manipulation.

## 2. F2F Interview(1 hrs) (Bangalore)

Q1: Find the diameter of the of binary tree with least complexity(O(n)).

<http://www.geeksforgeeks.org/diameter-of-a-binary-tree/>

Q2: Convert a binary search tree to balanced binary search tree(with and without rotation)

## 3. F2F Interview(1:30 hrs) (Bangalore)

Q1: Intro and explain project

Q2: Assume, there are millions of line in a file. Print the last K lines from that file.

Q3: Coin change problem(Normal solution and dynamic programming solution) <http://www.geeksforgeeks.org/dynamic-programming-set-7-coin-change/>

Q4: OS concepts- Virtual memory and Paging

Q5: Print Tree in the vertical form <http://www.geeksforgeeks.org/print-binary-tree-vertical-order/>

Q6: One pointer manipulation question in Linked list (forgot exact question :)).

Q7: Tell me about the design patterns that you have used for your project. Explain their application.

## 4. F2F(video conferencing from Noida) Interview(1 hrs)

Q1: Intro and explain project

Q2: Difference between 32 bit and 64 bit OS

Q3: Explain the scenarios when C++ program might crash.

Q4: Optimize Linear search in an array for least number of comparison.

Q5: One more programming question regarding array. Can't remember

## 5. Director's interview: (Bangalore)

Q1: Intro and explain project

Q2: What you learned from your last project?

Q3: What will you avoid if you have to do it again.

Q4: How do you manage to succeed in IT industry in spite of being from Electronics background

Q5: You have 4 byte integer. WAP to return the number of set bits in O(1) complexity. You could use some space if u need

Q6: Current offers and concerns regarding salary and job location.

I'd like to thank GeeksforGeeks for helping me during my interview preparations. Hope this helps. Please comment if any clarification is needed.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

# Adobe Interview Experience | Set 38 (4.6 Years Experienced)

Round 1:

Q1. Implement memcpy function. How do you make compiler to give warning if user passes numberOfBytes less than equal to zero.

Q2. Write code to multiply two matrix.

Q3. What is SIMD?

Q4. What are different IPCs mechanism.

Q5. Find least common ancestor for N-ary tree, given pointer of two nodes. tree structure has parent pointer too.

Q6. what are the principles of Dynamic programming.

Round 2:

Q1. Design like/unlike feature of facebook, when some one uploads a photo.

How do u notify to users who have already liked the photo.(Observer pattern)

10 million users like the photo at the same time, how do you handle such scenario.

Solution:(duplicate the photo instance in multiple servers based on load balance and do parallel reduction technique to do like++(lock like in each server) for each server and then broadcast the number of likes to other servers )

Q2. Write code for inorder traversal of a tree. Recursive and iterative using stack.

Q3. Given a matrix of size nxn, how many ways are there to go from 0,0 to n-1,n-1. Both recursive and DP based solution.

Q4. Given a matrix of size nxn and filled with 0s and 1s. you can't step into cell with zero. what is the shortest path to go from 0,0 to n-1,n-1. Both recursive and DP based solution.

Round 3: (Director Round)

Q1. Why do we need copy constructor?

- Q2. Write method signature for copy constructor.  
 Q3. Write method signature for operator overloading.  
 Q4. Implement a stack which supports push and pop function. Write production level code.  
 some question related to work and behavioral questions.

Round 4:

Q1. There are two players A & B.

Pots of gold are arranged in a line, each containing some gold coins (the player can see how many gold coins are there in each gold pot – perfect information). They get alternating turns in which the player can pick a pot from one of the ends of the line. The winner is the player which has highest number of gold coins at the end.

The objective is to maximize the number of gold coins collected by A, assuming B also plays optimally. A starts the game. You need to tell the final state of both the player.

Q2. Can we do `array[i]=i++;`

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Adobe

## Adobe Interview Experience | Set 37 (3.5 Years Experienced)

Online Written Test

20 MCQ + 5 Coding Questions

### F2F 1

- There are two sorted arrays . Find the median of array obtained by Merging these two arrays.  
<http://www.geeksforgeeks.org/median-of-two-sorted-arrays/>

2. Find Transpose of a Matrix.

3. Tell me about Garbage Collection . I told him about GC process and different types of GCs available. Then Interviewer asked about Mark and Sweep Algorithm.

4. Fill 4 Lt using 5 Lt and 3 Lt Jars.

### F2F 2

1. There are tuples given for each users of a website ( $S_i, E_i$ ) where  $S_i$  denotes the when the user entered the website and  $E_i$  denotes when the user exits the website .Find the maximum number of users active of website at any time duration.

2. Given an array that contains both positive and negative integers, find the product of the maximum product subarray  
<http://www.geeksforgeeks.org/maximum-product-subarray/>

3. Rotate a Matrix clockwise by 90 degree.

4. Puzzle : There are n Prisoners standing in a line with increasing height such that each prisoner can see the hat color of prisoners standing ahead of him but he cannot see his own hat color. Hats are of only two color , Red or Blue. Now each prisoner has to say his hat color. If he is right, he lives otherwise the Jailer will shoot him. Find the strategy to save maximum number of prisoners.

5.

```
class
{
    int i = 0;
    method()
    {
        // updating the value of i to 10
    }
}
```

We want to execute this class in Multi threaded environment such that each thread should have same initial value as 0 .

Ans: I told him to use ThreadLocal Variable and store i in it . Then we started discussing on Thread Local Variable and Java Memory Model.

### F2F3

- There is a binary stream coming . You need to print true or false based on the fact whether the number formed is divisible by 5 or not.

Hint:I used state machine

2. Print all subset of a Set .

3. Implement Dictionary .

I used Ternary Search Tries.

4. What is Adapter Design Pattern . Give an Example and draw class diagram.

### F2F4 (Director Round- Telephonic)

It was very short (15-20 mins). Comprised general discussion of my project , the internal architecture of framework i am using. Few Scalability concepts.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Adobe

### Adobe Interview Experience | Set 36 (Off-Campus Drive)

#### Online Written Test:

Multiple choice questions on aptitude and programming 2 coding questions.

#### F2F R1

- Given a string of any length. print all possible combinations of string length k

Hint use recursion

- Given a matrix, print in spiral order.

- Verify whether given tree is BST or not.

Had solved as per the method 3 <http://www.geeksforgeeks.org/a-program-to-check-if-a-binary-tree-is-bst-or-not/>

Then he himself orally briefed about method 1 from the same link and asked me to write code for the same and figure out what's wrong with the approach.

#### F2F R2

- Given a Node such that

```
Node x {  
    boolean ifFile;  
    int[] children;  
}
```

had to print all the paths from root to the file. if there is no file don't print anything.

Note: This is not tree or graph.

The structure is like windows file system and hierarchy can be any long. So recursion will cause stack overflow. Solve it without recursion

- Given a sorted array with one number having any number of duplicates

For eg [1,2,3,4,4,4,5,6]

Find the index of the first occur of duplicating element.

So for above example your function should return 3.

Hint: Use Binary search

- Minimum number of jumps to reach end

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).

If an element is 0, then cannot move through that element.

Example:

Input: arr[] = {1, 3, 5, 8, 9, 2, 6, 7, 6, 8, 9}

Output: 3 (1-> 3 -> 8 ->9)

#### F2F R3

Discussed about resume and projects worked upon.

- Given a binary stream, state if the number is divisible by 3 at any point of time

Discussed 2-3 approaches.

- Discussed various approached to implement dictionary.

- Given a set print all possible subsets.

#### F2F R4 (directorail round, last one)

Discussed about my work projects and college projects as well.

Discussed various approaches and complexities for array rotation problem.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

### Adobe Interview Experience | Set 35 (Off-Campus Drive)

Recently I appeared for adobe interview drive at Hyderabad.

Here is the questions being asked to me.

**Round 1: Written test** based on online hackerrank.

- MCQ choice questions on aptitude and 5 coding questions.

**Round 2: Telephonic discussion.**

- Infinite streams of number, find top k numbers.
- OS scheduling policies.
- 9 balls puzzle to detect the faulty ball.

#### Round 3: F2F

- Print a m\*n matrix in spiral form.
- Detect & return the intersection point of 2 linked list.
- Puzzle- Calculate the value of pie given area of circle.

#### Round 4: F2F

- Multiple 2 numbers using bitwise operator.
- Given a number, find the next highest number formed using the same digits.  
Eg: I/P: 25317  
O/P: 25371
- Clone a linked list given 2 pointers, next & arbit.
- Concept of virtual destructor.
- Delete operator in C++

#### Round 5: F2F

- Given an empty string of size n & value k. Find permutation of string with the value at each position ranging from 0 to k-1.
- Given a windows file system structure containing folders & file. Given a method IsFile(). Print all the path from root which ends in a file.

#### Director Round:

- Discussion about projects done with previous company.
- Design hashtable , write APIs exposed to user & underlying architecture used.

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## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
[Adobe](#)

## Adobe Interview Experience | Set 34 (For MTS-1)

Recently I appeared in interview for MTS-1 Adobe. Here is my experience.

**Written Round:** Very easy aptitude Questions on geometry, DI, profit loss etc.

Main are the coding questions which were:

1. Paranthesis matching
2. Row with maximum 0s in a matrix with 0s and 1s where in each row 0s come before 1s
3. Multiply two numbers without using \* operator and minimum number of additions
4. Check if a number is palindrome
5. Check if given sum is available in array.

Also there are 3-4 OS questions on memory management and synchronization.

#### F2F Round 1:

All the interviewers were very sweet. First interviewer asked me about my present role in the company and the technologies I use. The requirement was for Java, Spring, Hibernate and jsp. And these are the technologies that I had been working on so I had an edge. He asked me about Hibernate. Why we use hibernate? What alternatives we have? Why spring? Dependency injection? I explained with an example. It was a long discussion.

Java Question:

```
C = "abcd"
try {
    c.substring(0);
}

catch(Exception e) {
    //
}

} finally{
    c.substring(1);

    print c; //what will be the output
}
```

No coding Questions were asked in this round.

#### F2F Round 2:

Tell me about yourself.

Rate yourself in C,C++ and in java .

How confident are you in java? Then he started asking conceptual Questions in java. Exceptions in java. Checked and unchecked exception. Little discussion on that.

If exception is thrown in finally block what will happen?

Ans: The exception goes up the call stack.

What are the cases in which finally block wont be executed?

Ans: jvm crash or exit command in try.

```
class A {  
    int a = 1;  
    static class B {  
        printA() {  
            System.out.println("a:" + a);  
        }  
    }  
}
```

Output of this question? Ans: static inner class can access only static members of outer class. So this will give compile time error.

Final Keyword in java. Output Q on that.

Abstract class Vs interface. When to use what. How it works?

He then asked about my project and how client and server communicate. REST APIS related Questions.

Coding Q: Given inorder and postorder traversal make the actual tree.

Find the longest distance between two nodes in a tree.

He asked me if I had any questions. I asked about the work I was being interviewed for. What it is and where it is used.

#### F2F Round 3:

Tell me about yourself and your role in the company. What does your company do? Which project are you proud of and why? I told about a project that I had done individually. He asked everything about that project starting from the use case to technologies used.

How will you find out in a program that system is 32 bit/64bit. Ans: sizeof(viod\*)

Implement your own collection class

Why do you want to join Adobe? And why leaving the current job in less than a year.

Find Local minima in an array

Print right view of a binary tree.

#### F2F Round 4: (Director Round)

We spoke a great deal about my present work and the work that they do.

Design a DS which does push, pop and min in O(1)

K arrays each of size n is given. Merge them in minimum time complexity. Space is not a problem. Before the solution he wanted the exact equation and the time complexity. Then the code.

Note: in all the interviews they asked to write a code in such a way that its going in production today.

#### HR round:

He asked how were the interview rounds according to you. He then asked current CTC and expected CTC. He was very friendly. He asked me to tell about myself. Things that distinguish me. He told about the awesome Adobe campus and the food and games and gym. Why you want to join us, etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 33 (On-Campus)

Adobe came to my campus in April 2016 for Software Engineer(White Box Testing) profile.

#### ONLINE ASSESSMENT ON HACKERRANK:

First, they took 2 online tests. An aptitude test having 50 questions to be done in 45 minutes. It was pretty easy. Mostly questions were on logical reasoning based on seating arrangements, data interpretation, test cases, find the area of some given figure, inferences based, speed, simple interest, discount, shares type questions etc. There were no questions which required much calculation like pipe cisterns, work and time, trains etc

TRICK : Start from last. Do data interpretations questions in end. Most importantly, Be quick.

Second was online technical assessment. It was of 35 minutes and had 18 questions. 14 questions were C/C++ MCQ and last 4 questions were subjective coding questions. You can't run and test the code there.

Coding questions were:

- 1) Draw a pattern of stars having inverted triangle.

- 2) Write code in C to multiply two matrices.
  - 3) Write code in C to find the decimal number if its binary conversion is given as a string.
  - 4) How will you generate a stream of random numbers using rand() function and ensure that every time it generates unique numbers.
- Codes were easy .Basically they wanted to evaluate whether you include all test cases or not.
- 13 students were shortlisted on the basis of these 2 online tests and were invited to Adobe Office at Noida.

#### ASSESSMENT 2:

It was pen and paper round. 3 coding questions were asked.Out of which ,we had to write two codes in 20 minutes.

- 1) Find the nth node from back of the linked list.
  - 2) Find the maximum sum subarray from a given array.Array can have negative elements too.We have to print initial and final position of the subarray. Hint: Kadane's Algorithm
  - 3) Find the factorial of 100. Hint: Use an array to store results.
- PS: Hints were not given there.

#### TECHNICAL ROUND 1:

Interviewer was pretty cool and nice to me. She asked to give my intro to her and brief description of my projects.She asked me what approach I used in the previous round to answer the questions and what other method I could have used to improve complexity.She also asked the technical questions which I did wrong in online test.She asked me what are binary trees and to write the code to make a binary tree.Given Inorder and Preorder in the form of arrays.

She asked me a lot of questions from operating systems like Virtual Memory, Context Switching, Assigning priorities to processes and detailed discussion on it.

She asked me the difference between static and auto in C.

What are dangling pointers and memory leak .How you can avoid them.

She asked me all types of testing.Automation testing,Memory leak testing,Loop testing,Performance testing etc

7/13 were rejected after this round.

#### TECHNICAL ROUND 2:

Interviewer was very friendly.He first introduced himself and what work he and his Core Technologies team do at Adobe.Then he asked my introduction.He asked me various well known puzzles like gold bar puzzle ,socks puzzles.One question was if I have Sunday on 1st Jan 2000. Then in which year ,we will have Sunday on 1st Jan again.(I used the odd days trick and answered him quickly). He asked me some questions on virtual memory,priorities of various processes.How OS assigns the priorities to various processes. What will happen if 2 processes having same priorities come?LRU ,MRU,techniques etc.

He asked the test cases that I will try if a system is running slow.

He asked me test cases on Like button of facebook,test cases on if someone uploads a picture on fb, test cases that I will run on login page of a website.

I gave him many and he was impressed.

PS: If an interviewer asks a puzzle and says whether you have done it before or not.Never say yes in any case.

#### MANAGERIAL ROUND:

Interviewer was very polite and nice.She asked me about my major project and we had detailed discussion on it.She asked me 1-2 questions that I was not able in Tech round 1.I explained her very well this time. She asked me whether I am placed or not. If yes, then in which company I am placed and what they are offering to me.What is the location of that company. What profile I have been offered here. Why you want to join Adobe instead of that company(Azcom Technologies).

Do you use Adobe products.Which one you like most and what feature of that product fascinates you most?She asked me how I use paid products of Adobe.

I frankly told her I use cracked versions and she smiled.(I thought I did a blunder but later I got to know that she was impressed with my truthfulness).She also asked me to write the code to find a given word in the given string.I wrote the code and included all the test cases which was important for this role irrespective of time & space complexity.

1 person was rejected.

#### HR ROUND:

I got a call for this round just after the previous round.HR was coolest lady at Adobe.(Later she clicked our pics too :P) At first,She offered me tea/coffee.She asked me typical HR questions .

What are your strengths and weaknesses.

What you want to join Adobe.

What do you see yourself 2 years down the line.

What position you have in your class.

Our college which was part of IPU before has changed to a state university .We discussed about it also.She asked me what changes I have seen after this conversion to state university.

She asked me how ppl know me at my college apart from my academics performance.How my previous interview rounds went?

It was very short and nice interaction with her.

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

## GATE CS Corner Company Wise Coding Practice

# Adobe Interview Experience | Set 32 (For MTS-1)

I was recently interviewed for MTS-1 at Adobe. Here is my interview experience:

## 1) Online written round

1. **Aptitude test**, time = 45 min, questions = 60. (**Tip:** Start from last question.)

2. **Coding test**, time = 2hrs, questions = 7 coding, 13 technical multiple choice.

Multiple choice questions contained maximum questions related **pointers**.

7 coding questions:

1. To check if the parenthesis are balanced.
2. Matrix has rows in the form of 1's followed by 0's. Find the row with maximum number of 1's.
3. Reverse a linked list.
4. Multiply two numbers using minimum number of additions.
5. Find if the number is palindrome or not?
6. Find the number of pairs which sum up to a particular sum 'K'. Numbers may be positive or negative
7. Every number ending with 3, has at least one multiple of all 1's.

## 2) Telephonic round

**Q1:** Find the smallest K elements in a continuous stream of integers.

**Q2:** Find the intersection point of two linked lists.

**Follow up** – You can't compare node's data as well as address.

**Q3:** Write code for merge sort.

## 3) F2F

**Q1:** WAP to clone a linked list.

Be sure to cover all the edge cases.

**Q2:** There are n players in a tournament. Players hold transitive property i.e. if A beats B and B beats C then A automatically beats C. Find the minimum number of matches required for finding the winner.

**Follow up** – Minimum matches for finding the first runner up. Which data structure will you use for this question?

**Q3:** In memory layout of a process.

## 4) F2F

**Q1:** You developed your own image editor let's say Picedit. An update of Picedit is delivered to customers. After updating, the customers report an inconsistent problem of Picedit crashing but the same cannot be reproduced at your end even by using the same image file.

You are provided the window crash call stack by customer. How will you approach this problem? What are the probable causes?

How will you use call stack to find out the erroneous line of code?

A lot of discussion on reasons for heap corruption.

**Q2:** Design a garbage collector in c.

**Q3:** Suppose you have a repository of a million records of mobile numbers. A lot of discussion on how will you store these numbers so that you can check whether a given number already exists in minimum space and time complexity?

**Q4:** Discussion on stack frames, Printf, signed int and unsigned int memory representation.

## 5) F2F

**Q1:** Find output of a program related to pointers. (It was simple although I got it wrong first 😊 )

**Q2:** You are given a function let's say bin() which will generate 0 or 1 with equal probability. Now you are given a range of contiguous integers say [a,b] (a and b inclusive).

Write a function say rand() using bin() to generate numbers within range [a,b] with equal probability.

**Q3:** Consider a regular telephone dial up. It has generally three alphabets for each digit. For example, ABC for 2 and so on.

Given a number. Print all the possible strings by taking one alphabet corresponding to each digit in number.

Input: 254

Output: AKH, AJG etc.

**Q4:** WAP to tokenize a string.

## 6) F2F

**Q1:** Given a number say N. WAP to print the next greater number by using the same set of digits of N. For example:

Input: 123

Output: 132

**Q2:** You have a continuous stream of strings. At any point of time, you have to print the strings such that those which are permutations of one another are printed together.

WAP for the same.

For example:

Input: {'act', 'cat', 'dog', 'tac', 'abc', 'god', 'bac'}

Output: {'act', 'cat', 'tac', 'dog', 'god', 'abc', 'bac'}

## 7) Director round

**Q1:** Discussion on a piece of work that you have done in your past and you are proud of.

**Q2:** Design a mobile application that gives user a set of nearest restaurants available.

Discussion on what will be your approach for densely populated areas and sparsely populated areas.

How will you identify whether user is in densely populated area or sparsely populated area.

You have (x,y) coordinates of user as well as all the restaurants with you.

## 8) HR round

**Q1:** What do you know about Adobe? Its headquarters etc.

**Q2:** Why Adobe?

**Q3:** Why should we hire you?

**Q4:** PDF full form.

### Few Tips:

1. Adobe truly evaluates a candidate on the basis of how you approach a problem instead of bookish answers. You can get through even if your answer is not the best one but approach is different. Concentrate on that.
2. Be prepared with space and time complexities for all the questions.
3. The programs that you will write should handle all the possible test cases.
4. You will be asked for more than one approach for almost every question.
5. Interviewers were very friendly and will make you feel comfortable.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 31

I was interviewed by Adobe at hyderabad following is the experience

### F2F Round 1:-

1. What is MVC in angularjs ?(Angularjs was mentioned on my Resume so he asked me)
2. Write programme to find first repeating element in an array  
sol :- <http://www.geeksforgeeks.org/find-first-repeating-element-array-integers/>
3. <http://www.geeksforgeeks.org/design-and-implement-special-stack-data-structure/>
4. Given a node in directory structure(folder). Print all the sub node of the folder with its path. Structure of node is

```

struct Directory
{
    // true if given node is directory or not
    bool isDirectory;

    List * child;
    String nameOfNode;
}

```

#### F2F round 2:-

1. In UI given a dropdown with name of employee and a entry as "all" on clicking any entry it should show details about that employee on selecting all it should show detail of all employee

He asked me to write sql query for it

Ans : select \* from emp\_table where emp\_name=selected\_emp or selected\_emp=all;

2. He asked me to implement "AND" (if input is bool1 and bool2 return (bool1 && bool2) ) gate and "NOT" ( if input is A return !A ) using abstract class GATE. Then he asked me to implement child class "NAND" using "AND" and "NOT" as parent(base) class

3. Asked me to search a word (string) cross word

<http://www.careercup.com/question?id=14560771>

4. Give an array of integer find all repeated element (non uniq) in it.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 30 (Off-Campus For Member Technical Staff)

Hi, I was recently interviewed for MTS at Adobe. Here is my interview experience:

### 1)Online aptitude test

### 2)Online technical test :

**It comprised of C MCQs and coding question(in any language).**

**Coding questions were:**

1. To check if the parenthesis are balanced.
2. Matrix has rows in the form of 1's followed by 0's. Find the row with maximum number of 1's
3. Reverse a linked list
4. Multiply two numbers using minimum number of additons
5. Find if the number is palindrome or not?
6. Find the number of pairs which sum up to a particular sum 'K'. Numbers may be positive or negative
7. Every number ending with 3, has at least one multiple of all 1's.

### 3)Written test (10 questions, 1hour):

1. Given a boolean number in string form. WAP to output the 2's complement of the number in the same form(string).
2. Define a doubly linked list. WAP to reverse the list in place.
3. Find gcd of 2 numbers using recursion.
4. Write a function to find maximum of three numbers using ternary operator only.

```

5. int a = (int *) 60;
   int b = (int *) 40;
   printf("%d",a-b);

```

Ans. 5.

6. Some variable is declared in a file. It is now used in another file using extern keyword. What possible problems could arise?

7. 1 output question of recursive function., 1 output question of #define, meaning of 2 pointer declaration were asked, 1 output question of 3d array.

### 4) Technical Interview 1:

- 1) Segregate balls of red, blue and black color stored in an array.

<http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/>

- 2) Consider a directory Structure. Given a file object of outermost directory, print unique names of files. You are given a predefined isFolder() method.

- 3) Consider an alarm system with operations:

addEvent(eventId,time,callback()) – Callback function could be playing a ringtone on the alarm.  
removeEvent(eventId)  
updateEvent(eventId,time)  
executeEvent(time) – This will call the callback function of the event to be executed at the given time.  
Discussion on possible data structure to be used along with complexities of each so that executeEvent function is optimized i.e. takes least time.

#### 5) Technical Interview 2

1. Compare C and C++/Java. Discussion on polymorphism, method overloading, method overriding, Constructor, handling errors, dangling pointer, memory leak. Suppose a class takes positive Integers only, what will happen if we try to create an object giving negative value. How to catch the error. How is the memory deallocated for the object. What is full form of PDF.
2. What is thread? What problems arise with multithreaded applications? How are they solved? Difference between semaphore and mutex?
3. Given 2 sorted arrays , find kth smallest element among them.
4. Reverse a linked list in place, without returning the head pointer.

<http://www.geeksforgeeks.org/write-a-function-to-reverse-the-nodes-of-a-linked-list/>

#### 6) Technical Interview 3:

1. <http://www.geeksforgeeks.org/search-in-row-wise-and-column-wise-sorted-matrix/>
2. <http://www.geeksforgeeks.org/reverse-level-order-traversal/>
3. <http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/>  
<http://www.geeksforgeeks.org/clone-linked-list-next-arbit-pointer-set-2/>
4. Given a binary search tree to be transmitted over a network, WAP to store the BST at sender side and recreate BST on receiver side.
5. What data structure is used for dictionary. What are limitations of that data structure.

#### 7) HR Round:

1. Tell me something about yourself.
2. Why should we hire you.
3. Why Adobe?
4. What is your dream company?
5. Family background.
6. Adobe CEO, headquarters, when it was established.

#### 8) Director Round:

- 1) Tell me something about yourself personally as well as professionally.
- 2) Design a mobile app which tells nearest restaurants to your current location. Discussion on how restaurants should be stored on database. How should database be searched for restaurants based on current location. How it can be optimized in case of remote areas and dense population areas.
- 3) Given n red balls, m blue balls and 3 containers, how would you distribute balls among the containers so that the probability of picking up the red ball is maximized.
- 4) WAP to read through a file and print tokens of length 5 comprising of alphanumeric characters only.
- 5) Questions from resume.
- 6) What is your strongest quality. Give an example of a situation.

I would like to thank GeeksForGeeks which helped me a lot in my interview preparations.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 29 ( Off-Campus)

Written:

1. Online Aptitude test, time = 45 mins questions = 60.
  2. Online Coding test, time = 2hrs, questions = 7coding, 13 technical multiple choice.
- 7 coding ques. :**
1. To check if the parenthesis are balanced.
  2. Matrix has rows in the form of 1's followed by 0's. Find the row with maximum number of 1's
  3. Reverse a linklist
  4. Multiply two numbers using minimum number of additions
  5. Find if the number is palindrome or not ?
  6. Find the number of pairs which sum upto a particular sum 'K'. Numbers may be positive or negative
  7. Every number ending with 3, has at least one multiple of all 1's.

#### 4 F2F Rounds

##### Trick:

1. First solve using brute force, then if he asks to optimize, optimize the solution. never give optimized solution in the first go. think think and think about the question, if still not able to solve, asks the interviewer for hint.
2. Be ready with the complexities of all the answers that you give.

##### Round 1:

1. Method to determine whether a number is a power of two.
2. Find a number in a 2-D matrix sorted horizontally and vertically.
3. Find number of set bits in a number.
4. Find largest and second largest number in an array with minimum number of comparisons.

##### Round 2:

1. if you cover distance x, then in the next step you cover 2x then 4x.in this way you cover total distance n. tell me the way in which you are travelling.  
My ans: geometric progression, he was like okay.
2. What is inorder, preorder, postorder. write the code and the output for the given binary tree.
3. how to make a tree from the combination of any two, also write the full function code. why cant we make binary tree from post and preorder? Explained well.
4. Find the intersection point of two linked lists with full code.
5. how to compile two .cpp codes together.
6. what is makefile? utilities?
7. where is printf stored? all the internal details.
8. explain logical and physical memory.
9. explain paging.
10. what does stdio.h do? difference between #include "" and #include .
11. what gets included when we do #include?? does it includes the whole definition of the function or just the prototype?
12. what is the role of assembler in "gcc a.c" ?
13. what does linker do? how does it link? functions of a loader?
14. Explain all the compilation steps in this command "gcc a.c b.c c.c".

Be familiar with the preprocessing and compilation in deep and its internal working details.

##### Round 3:

1. You are given 4 (x,y) coordinates of a rectangle, 1 (x,y) coordinate of a circle and its radius. write the code to find if the rectangle and the circle intersect?  
Intersection: if a point on or above the figure is also on or above the other figure.
2. A sorted array is rotated around an element. Modify binary search to search for an element in the array.

3. There are 2 processes, A and B, their working:

A : Makes .jpg files and stores them at some address.  
B : Retrieves the .jpg files from the same address.

There is no producer-consumer problem. B retrieves only when A has produced some file.

Now instead of storing the entire file at some other address, the process A makes files and just pass the address of those files to process B.  
Will B be able to access those file?

Correct Ans: No, it won't access because any process just can't enter another process' block to retrieve something.

My ans:

1. yes, if they were using some shared memory and the files are stored on shared memory.
2. no, if not shared memory because the address given by A is the logical address not the physical address, so B can't access until it is given physical address.

##### Round 4 (Engineering Director):

1. An array is given of size m, only n indices are filled. rest contain garbage. n for (int i=0; i

Then he asked that in this loop there are 2 comparisons in each iteration, i a[n]=x; for(int i=0; a[i]!=x; i++); //only one comparison now. if(i

2. There is a lake, it can have any random shape, you have to measure its volume without spending a lot of money. how will you do it?

—————END—————

Preparation source links:

1. <http://gohired.in/adobe/>

2. <http://www.geeksforgeeks.org/tag/Adobe/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

### Adobe Interview Experience | Set 28 (For MTS-2)

#### Written round:

3 hours of written test.

First technical and then aptitude.

Few technical questions that I can remember.

1)

```
int* a = (int*)60;
int* b = (int*)40;
printf("%d", a-b);
```

Print the output. (Ans: 5)

2) Given a boolean number in string form.

WAP to output the 2's complement of the number in the same form(string).

3) Convert a prefix expression to postfix.

4) Some assembly program was given, needed to tell what exactly the program was doing.

5) Some basic hash related questions.

Aptitude questions are standard and repeated everytime.

Can be looked up on the net.

#### Round1: F2F

1) Implement n-ary tree using down-right approach.

Traversal both level-order and in-order.

Asked to code everything.

2) What data structure would you use to store a composite linked list?

Composite means that the data value in the individual nodes could vary among the primitive data types.

I started with void\* and an enum entry to specify the type to help during retrieval.

Then moved to using union. He looked happy with this.

3) Implement malloc and free.

4) Memory layout of a C program.

5) What do I like about Adobe Photoshop from the technical point of view?

How would you load and display a 3 GB data file at runtime.

#### Round 2: F2F

1) Design and implement garbage collector in C.

Many aspects were discussed here.

When to trigger?

Who is responsible?

Which memory to free?

2) Given an integer number, how would you determine if it is a palindrome.

He wasn't too impressed with the stack based method.

Wanted in lesser space complexity.

So gave solution like this:

```
rem = num1%10;
num1 = num1/10;
num2 = num2*10 + rem;
```

if the new number created is equal to the original, it is a palindrome.

He wanted me to optimize it further.

So started comparing num1 and num2 also, if the number has even-digits, it would return early.

Also, if the number is a multiple of 10, can outrightly say it is not a palindrome.

3) Given a integer number, find the next higher palindrome number.

**Round 3: F2F**

1) Code to check if a binary tree follows the below property.

Every node's data = sum of left subtree + sum of right subtree.

2) Design a model for implementing sync mechanism for Google drive.

(handling only the client side).

Same file can be accessed and modified by different clients.

Take care of power failure, no internet connection scenarios too.

3) Given an infinite stream of boolean digits, need to tell at runtime whether the number received so far is a multiple of 3.

example, first digit received is 1, so number is 1 -> not a multiple of 3.

second digit received is 0, so number is 2 -> not a multiple of 3.

Constraint is that you can only use a 2-bit buffer to store.

Ans: always store the remainder to know if it is a multiple of 3.

in the above example,

rem =  $1 \% 3 = 1$

when 0 comes, new remained =  $2 * 1 + 0 = 2 \% 3 = 2$ .

and so on.

**Round 4:**

1) Code for given a sorted but pivoted array, find the ceiling of a given number.

2) Discussion on projects.

Volatile keyword.

Discussion on use of extern and static.

3) Big endian and little endian architecture.

How to identify if big endian or little endian.

If something has been written on the disk using big endian architecture and then read using little endian architecture, how would happen?

**Round 5:**

2 questions asked here, i genuinely didn't know the answer to.

I just tried attempting in all possible ways and analysing the pros and cons.

1) Given a rectangular sheet of paper, and a set of very irregular shapes.

I was to cut these shapes out of the paper, in such a way

that 'there is a good mix' of all the pieces and the wastage of paper is minimal.

When I say irregular, it can also have a hole in the middle.

2) Say now, on a touchscreen display, you have those set of irregular pieces.

You touch at a point and swipe it, the corresponding piece should move in that direction. This game is interactive and needs good time complexity.

3) Given a fairly large number, need to tell whether the number is part of fibonacci series or not.

You are not allowed to generate all the number in the fibonacci series.

I was not aware of the direct formula to check this at that point.

So tried the matrix multiplication method to calculate the nth fibonacci number.

I calculated the 1st number, 2nd number, 4th and so on, till the number exceeded the given number.

And then used binary search to track the answer down.

4) Was asked if I could improve the performance on the hardware.

I said by calculating all four members of the matrix parallelly on four cores, if available. He looked satisfied.

Asked to explain the MVC design Pattern.

Thank you geeksforgeeks for the awesome resource you are!

Cheers!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 27 (On-Campus for Internship)

Round 1: Online Round 60 min.

8-9 Questions were asked.

6 Aptitude Questions: (1 point each)

2 coding questions: (2 points each) (only pseudo code)

1: Given the ID, starting time and ending time of racers, Output the no. of racers whose starting time is greater and ending time is less than a racer.

2: Given a BST output the rank of the an element in that tree in less than O(n) time.

Rank of an element is the index of element when all the elements of the tree are in sorted order. eg 4 5 6 7 8 ; rank of 5 is 1, rank of 4 is 0;

#### 1 Writing Question ( 3 points)

Imagine that self driving technology has been achieved. Describe the ecosystem surrounding such a world and what technological break-through do you think that would have evolved by that time.

Around 15 students were shortlisted based on the Cumulative of score in first round and C.G.P.A

#### Round 2 (Telephonic Interview) 30 min.

First of all he asked me to Introduce myself.

Then he asked configuration of my laptop.

Interviewer : A recursive function has no termination condition. What will happen when it runs.

Me: Stack overflow.

Interviewer: Given a simple recursive function which calls itself:

```
eg: void f() {  
    f();  
}
```

How long will it run in your laptop.

Me: I asked for certain assumptions.

1st: what stack space shall I assume?

Interviewer: Half of RAM.(4 GB)

Me: 2nd: I further assumed 4 bytes are required for addressing.

time = (4 GB/ 4 Byte)/frequency; frequency-> processor speed (2.0 GHz)

This is not accurate solution... accuracy involves lot other parameters.

He was just checking my Approach that how I solve the problem.

He further asked me about my favorite subject. I said Data Structures.

He didn't ask me even a single question related to data structures.

Interviewer: What other courses have you done,.. Have you done OS?

Me: yes.

Then he asked to differentiate b/w Process and Threads.

Further he asked .. Given an array of 1000 elements.Elements are multiplied in a for loop from 1 to thousand.

Time of execution is x milliseconds. How will you reduce x?

I thought a few mins .. didn't make out anything... then he gave a hint: During the time program was running, CPU performance was 50%.

Then I said use threads or fork to multiply first half in one thread and other half in another thread. Multiply the results from both the threads.

He further asked: Which one is better, fork or thread?

I answered Threads.

Interviewer: There is box and in that box there are real numbers ranging from 1 to 10. What is the probability of getting 2 out of that box.

Ans: Firstly I answered 1/10 .. then he repeated the question ... then I answered 0.

Interviewer: Does that mean we can't ever get 2 when I take a number out of that box.

Me: I said no, we can get but its probability is tending to zero.. very low probability.

Interviewer: You have got 1 last minute. How will you explain Internet in 1 minute.

I explained a bit then he asked Is there a central authority which runs Internet?

I said no.

End of Interview.

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## GATE CS Corner Company Wise Coding Practice

[Internship](#)  
[Interview Experiences](#)  
[Adobe](#)

## Adobe Interview Experience | Set 26 (On-Campus for MTS-1)

Adobe visited our campus for full time Member of Technical Staff-I (MTS-1)

**First round** consisted of an aptitude test and a coding test.

The aptitude test had 45 minutes and 45 questions.

The test was an average one. A tip start the test from the last question they were really easy as compared to the starting 15 questions.

The coding test had 3 questions to be completed in 90 minutes.

1) you are given the waste at certain positions with values between 1.01 and 3.00 and you can carry almost 3.00kg at one time. You had to tell the minimum number of

bags required to carry the waste.

Input

4

1.30 1.40 1.50 1.60

Output

2

Input

4

1.40 1.70 1.50 1.50

Output

3

Question 2) A CEO of a company wants to keep his employees happy. He can keep them happy if he has enough cookies in the pantry that are required at any time.

The values at ith position indicates how much candies one person needs.

A value  $C_i < 0$  means the employee needs cookies otherwise he keeps those cookies back in pantry.

Input

-5 4 2 -1 -6 -1 0 5

Output

8 (it should have been 7 but 8 was given so had to print ans+1)

Question 3) you are given the heights of n towers and a value k. You can either decrease the value of a tower by k or increase the value by k. You have to tell the minimum difference between the maximum and minimum height tower.

Input

3 5

7 -7 4

Output

4

## Round 2

24 students were shortlisted out of a potential 200 students.

I was asked 4 questions.

1) tell whether a string of parenthesis is valid or not.

2) you have an the heights of the bars given in an array first you have to tell the amount of rain water trapped between the bars and then he extended the question to finding the block with maximum water trapped.

3) print all the permutations of a string with and without repeating characters.

4) implement and tell the complexity of inserting a value in a vector in c++.

## Round 3

This round was the toughest round.

First i was asked to design a spell checker. I used tries and implemented most of the functions.

Then i was asked a few OS questions like difference between process and a thread etc.

Then i was asked what happens when you type a URL in your web browser.

Then he asked me a question on finding an element in a 2D matrix which is sorted column and row wise.

Finally he asked me to design a web browser and cover every aspect of it.

## Round 4:

This round was based completely on my past internships and projects.

A few questions were which project or internship excited you the most.

Finally 8 students were selected for the job.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 25 (On-Campus for MTS-1)

### Initial Round:

**Aptitude Paper:** 45 questions to solve in 50mins. Platform was Hackerrank. No negative marking. I solved around 35 approx. correctly.

**Online Coding:** 3 questions to solve in 90mins. Platform was Hackerrank. Two of them I remember.

1. Given a string with no spaces and random characters, we have to find that a given word can be formed or not if we start removing one character at a time. If one character is removed then it's all existences in the string will be removed. Print 'Yes' if possible else 'No'. E.g. finding "hacker" in "bhbacdkqegr" will print Yes. We also need to consider that "hacker" characters should come in order, I missed this case.
2. Given an array of 0's and 1's. Need to tell minimum number of swaps required to take all 1's to one side. Only adjacent swap is allowed.
3. Don't remember. Was related to DP.

### First Interview (1hr):

Presented himself and what he do. Took resume and asked "Tell me about yourself".

- Started with OS
  - Tell me about fragmentation. Internal and External both. How it happens?
  - Asked about Paging.
  - How space is allocated to processes in memory.
  - What is defragmentation? How it works?
  - What happens when I execute a process like play a video in my PC?
  - +more.
- Coding
  - Asked to write a code to do defragmentation. Basically I converted this problem to an array which contains 0's for free space and Non-Zero value for used space. Wrote a code of O(n) to shift all non-zero numbers to one side.
  - Write code to make mirror of a binary tree in-place. I said I already know that but still asked to code it.
  - Many memory allocation related problems
  - Write a method which will return me an array of size n every time(every time new).
  - Questions on static variables, malloc, calloc, pointers and how they work.
  - Wrote code on his own laptop and asked to find mistakes (static variables and pointers related).
  - +more
- Internship
  - What was my role? What I did, learned and experience?
- Puzzles
  - 5ltr and 3ltr jug problem. I said I know this so he skipped.
  - 25 horses problem. First time heard so solved there only.

Do you have any questions ?

#### Second Interview ( 1hr + ):

Saw resume and asked "Tell me about yourself". Questions on Internship, same above. Jumped to coding questions then.

- Make a string tokenizer. A string with its length and token character will be given, now return a 2D array which contains sub-strings of that string separated by that character and stored at different rows of array.  
e.g "I am a CSE student" and character is space, so now return-  
I  
am  
a  
CSE  
student  
this should be in a 2D array but 'NO EXTRA SPACE SHOULD BE USED'. Here you can't use a 2D array of 5x8(including '\0'). Hint: Use an array of pointers, each pointer in array will point to variable length string.
- Now write a method which will free the space used by above 2D array.
- Which data structure you will use to store phone directory so that you can access a person's number in shortest time?
- You are given a file which is a phone directory containing Name and phone number in each line of file. Now give me an efficient algorithm to find a person's number in shortest time. You can't use much space. You can jump to any line by use of seek. Hint: Do a pre-traversal of file.  
I made a 2D array of 26x26 size with a-z and a-z perspective and stored the starting line number of names starting with these characters in pre-traversal and then did binary search to search in between. E.g searching "ram" will appear between "ra" and "rb".
- You are given two files A and B, and each contains a number in each line. Print A-B. Consider number are sorted.

At last he was very satisfied with my approaches and answers.

#### Third Interview ( 1hr+):

First "Tell me about yourself" and then long discussion about my Internship. Same above questions of internship but also many questions on Ruby on Rails and about the product which I worked on and my experience, what challenges I faced, what I learned etc.

Then coding questions (all coded on paper):

- Write a method which returns hexadecimal representation of a given integer. Easy but same "No space to waste" so size of returning array was main. Different in case of 32bit and 64bit systems.
- Questions on memory allocation and pointers.
- Reverse words in a string. I Said I know this.
- What will be the number of unique factors of  $(p^a)(q^b)$  where p&q are different prime numbers and  $a,b > 0$ .
- Write a method returning pivot position in quick sort where initially I will be taking first value as pivot. I Said I know this.

I had not asked any questions in the PPT so he asked why I not asked any questions and I was present or not.

Next he opened my answers of the online test and asked why my all test cases not passed in 1st question(10/13 had passed) and why I didn't attempted 3rd question.

#### Fourth Interview (20-25mins): HR Round

- Tell me about yourself
- Tell me about your Internship in detail. Explained almost everything.
- When you gets angry?
- What is your dream job?
- You was in the PPT? Why you didn't asked any questions?
- Tell me about some of the Adobe products.
- Which is your dream company? I said Adobe is my 1st dream company, so she asked-
  - o So, what is your 2nd dream company?
  - o What if we don't hire you?

- "I said I will take job in any other company for now and will see you again next year."
- Gave me an office scenario where my manager is putting pressure on me to complete the work fast and I understand nothing about the work.
  - What will be my preferred location to work?
  - Asked about family background.

\*Can be the case that I missed many questions but these are the only one I remember.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

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### Adobe Interview Experience | Set 24 (On-Campus for MTS)

Adobe came for recruitment in my college. Here is my experience-

First round was an online round-

There were some aptitude questions and 3 coding questions.

I remember only 1 question out of the three.

You are given the height of n towers and value k. You have to either increase or decrease the height of every tower by k. You need to minimize the difference between the height of the longest and the shortest tower and output this difference. I solved this in  $O(n^2)$

#### First interview:

1. You are given an array of characters which is basically a sentence. However there is no space between different words and the first letter of every word is in uppercase. You need to put a single space between these words and convert the uppercase letters to lowercase. There are some extra spaces available in the array at the end.

Eg. "MyNameIsRam" , you need to convert this to "my name is ram"

I first told him an  $O(n^2)$  approach but the interviewer asked me to optimise so I came up with an  $O(n)$  time and  $O(1)$  space algo.

2. Find the intersection point of two linked lists. This is given on gfg.

3. Then he asked me some question on dynamic memory allocation which I don't exactly remember. Also asked about new, delete, malloc, free.

#### Second interview:

The interviewer asked me to introduce myself. After this there was long discussion on my internships and the projects I had done. I had done a project on machine learning so a long discussion went in this. Then some questions related to my CV. In the end he asked me a few questions on dynamic memory allocation and pointers.

#### Third Interview:

This was a very long interview.

1. He asked me to implement a spell checker- first check if it is the correct word and then check words which are similar to the given word. Eg how google shows in Did you mean!

2. What happens when you type a url in the browser? After this question there was a long discussion on how a browser displays a web page(HTML, CSS etc).

3. Convert an array to balanced binary search tree

4. Find duplicates in a string

5. Implement quick sort

6. Also some questions on different sections of memory of a computer(heap,stack,data etc)

#### Fourth interview- HR

There were some general HR questions like Why adobe, where do I see myself after x years, how was the entire recruitment process, my strengths and resume related questions.

Thanks geeksforgeeks! J

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

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### Adobe Interview Experience | Set 23 (1 Year Experienced)

I recently interviewed at Adobe, Noida office and got the offer. I had 1 year work experience.

It was a standard process comprising of an aptitude and technical test on hackerrank. Its the same every time. You can have a look at the test in previous archives.

## Screening

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### -Aptitude Test

-Technical Test having 13 MCQs and 7 standard coding questions.

## Interviews at Noida Office

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### Round 1.

=====

1. The interview started with my general introduction. The interviewer wanted to know if I had in depth knowledge of what I am working on, so he asked all sorts of questions related to the technologies and why they were used and not something else.

2. Questions Related to C, C++ – How are .h files loaded and linked with their .c files. I did not know much about it as I had experience in Java and told him the equivalent answer in Java.

3. How to find the minimum element in a rotated array? e.g. 4 5 6 1 2 3

Gave the answer using Binary Search

4. How to find a common node between two Linked Lists?

```
1->2->3->4->NULL  
|  
5->6
```

Gave an answer using difference in length of LLs and wrote the code which handled all the cases.

5. Then he discussed about Operating System Concepts, Virtual Memory, Paging, etc.

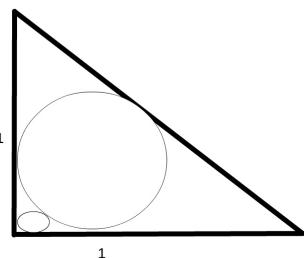
Note. Make sure you write code which handles all the test cases especially the boundary ones.

### Round 2.

=====

1. The interview started with my brief introduction. This time the interview was more interested towards my hobbies and passions. He asked me what do you do to keep yourself updated with the latest technology trends?

2. After that he asked me only one question related to geometry. The question was given an isosceles right angled triangle. Find the radius of the smaller circle.



Solved it using basic pythagoras theorem.

It was weird that he asked only one question.

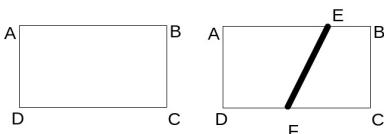
### Round 3

=====

This round was a tricky one.

1. The interviewer asked me what all had been asked to me till now. I confidently said that I liked that geometry was asked. I shouldn't have said that... ☺

The question was given a rectangle ABCD with length l and breadth b. Now it is folded along diagonal BD. i.e. A is joined to C. Find the length of the line segment EF



Solved the question with his hints. Basically it involved some deductions related to imagination and pythagoras theorem. Basically  $AE = EC$  and  $EF = EC$ . After that it is simple geometry question.

2. How do you heapify an array? What is the time complexity involved. Apparently he was interested in the exact complexity. I told him that we always start heapifying from the last parent whose index in the array is  $(n-1)/2$ .

He then asked me about how we heapify individual elements, etc. and how heap sort works.

Basically he wanted me to answer that we do not heapify elements from  $(n-1)/2$  till  $n$  which decreases the time complexity from  $n\log n$  which I answered in the end.

```
3. int a = 8;  
char *b = (int *) a;
```

Where does b point to?

Now this question was related to Big endian and little endian as in he wanted me to ask if the architecture is little endian or big endian. I told him I did not know about this.

After this question I told him that I am from Mechanical background and I did not know much about computer architecture. He was a little shocked and skipped the OS questions. Lucky me!!!

4. How to know if a number is a power of 2 in  $O(1)$ ?  $n \& (n-1) == 0$ ? true:false

5. Given an array of numbers all of which are repeated only one non repeated, find the non repeated number.

Gave the algorithm using XOR.

6. Then he extended the previous question to find if two numbers are non repeated. He wanted the XOR approach again.

7. Given two binary trees A and B. Check if B is a subtree of A. Solved using normal tree traversal.

8. Find the kth smallest element in an unsorted array of numbers.

First gave the approach using Heap. Put all the elements of an array in a min heap and extract k times. But he was interested in a better approach.

Answered using quick select algorithm (modified quick sort).

He told me there is a more optimized approach on the selection of pivot elements using order statistics. I did not know the order statistics method but he was quite satisfied with basic quick select algorithm.

Round 4 : Director Round

=====

1. My brief introduction. Why low CGPA, etc. ?

2. Given an array of size m out of which n indexes are allocated. How do you minimize the number of comparisons when you search an element in this array?

I wrote basic linear search code. Then he asked me how do you minimize number of comparisons.

3. Given n points in a plane which form a polygon. Find if a random point exists inside that polygon or not?

4. How would you find the volume of a lake. He was interested in my approach. I gave 2-3 methods, one of which was quite funny on which he laughed at me.

In the end he asked me if I had any questions regarding the role and all.

I would like to take a moment and thank GeeksforGeeks for helping me in my interview preparation. Cheers to you guys!!!

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Adobe

## Adobe Interview Experience | Set 22 (On-Campus)

Adobe Interview Experience (On-Campus)

Round 1:

=====

1) Coding round: 3 questions, 90 mins:

a) Given  $k, n, m$ . where  $k$  is no. of coconuts you initially have.  $n$  is the same no. such that if you have  $>= n$  coconuts, you become stressed otherwise you become normal.  $m$  is the no. of shops. You go from 1st shop to  $m$ -th shop without skipping any shop. At  $i$ -th shop, either you buy  $S_i$  coconuts or sell  $S_i$  coconuts. If you are stressed then you must become normal at next shop. If you have less than  $S_i$  coconuts and you want to sell then you must sell all the coconuts you have. The task is to calculate maximum possible changes of your mood from stressed to normal or vice-versa.

My solution: Used DP.

b) You have  $n$  nodes and  $m$  edges with their weights given. If no edge is given from node  $i$  to node  $j$ , you should assume there is an edge with weight=1. You have to calculate the min cost of path from node 1 to node  $n$ .

My solution: Could be done by Dijkstra, but Floyd Warshall was working for all test-cases hence saved my time by using Floyd Warshall.

There was one more question.

2) Apti Round: 45 questions, 50 mins.

1st F2F Interview:

=====

-Asked how you solved the coding questions. When I came on Dijkstra, It was a complete discussion on its algorithm and Time Complexity.

-A brief on my projects.

-OOP-Inheritance, Polymorphism, Abstraction.

-Discussed Hashing

-A problem on Spoj is encrypted using substituting cipher(substituted an English alphabet with another English alphabet). All spaces and punctuation marks are deleted.

How will you get the original problem statement.

-Discussed Heap

-Find 2nd largest element in given array using min. no. of comparisons. I told him solution with  $2n$  comparisons, but he kept insisting me to think more and reduce the comparisons.

2nd F2F Interview:

=====

-1 question on linked list

<http://www.geeksforgeeks.org/check-if-a-given-binary-tree-is-sumtree/>

-How to synchronize 2 threads, one which is downloading contents of a site while loading the website and another UI based thread which is showing the percentage completeness. Without using Java Synchronization concept.

-Discussed on sync on Dropbox. You are uploading something on Dropbox. Suddenly network connection is lost. After that you have modified file and then network is connected. What should you code on Client-side to resume it instead of restarting. It can be the case that the part of file that was uploaded is modified and you should resend the modified one.

3rd F2F Interview: (With Director)

=====

- An array is given of size m. First n elements ( $n < m$ ) are filled and rest contains junk. Write code for linear search to find an element x in first n elements. There would be 2 comparisons per iteration: ( $i < n$ ) in for loop and ( $\text{arr}[i]==x$ ). You have to reduce the no. of comparisons to 1 comparison/iteration.

- A two-balls question on trigonometry.

-Two balls with same weight and same diameter are there. One is solid and other is hollow. Distinguish between them.

-Archimedes principle.

-Why Mirage happens.

-Explain concept of TIR(Total Internal Reflection).

My solution for array question:

```
arr[n]=x;  
for(int i=0;;i++) if(arr[i]==x) break;  
if (i < n) return i;  
else return -1;
```

HR Round:

=====

Think of a real-life society problem and think of some innovative technology you can build to solve that.

All interviewers were very-friendly. Hindi was permitted except HR Round. It was an enjoyable experience.

Thanks Geeksforgeeks for Trees and Linked List.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview Experience | Set 21 for Software Engineer (Fresher)

Adobe Interview Experience for Software engineer (Testing profile, Fresher)

### Phase 1: shortlisting of resumes on basis of cgpa (7.5 in our case)

1) Online Aptitude Test- link is mailed to email account , consists of 45 questions in 50 minutes, reasoning questions bit tough, but quant part is very easy.

My advice for this test is start from the last question as starting 15 questions are tough, and after that questions are so easy that they dont even require pen and paper.

2) Online Coding test: 14 MCQ (C output based) and 3 C programs

in my case programs were multiplication of 2 (2X2) matrices and second was a pattern question(reverse pyramid) and one more i dont remember.

Now there are 2 f2f technical rounds.

### 1st F2F:

Interviewer was so friendly that as i was a bit nervous in the starting he took me to the cafe, and had a cup of tea with me and showed my his previous seat locations when he joined Adobe. Then the interview began, asked me in which language i am comfortable(tell only those you know coz they ask only from them) . i told i can code in C, and clear with concepts of Java.

Questions:

How java is platform independent?

He told me that if he mails me an excel file and when i try to open it, it doesnt open. asked me all the possible reason to it.? (gave me lot of time to think, basically he was checking how much i can think on it)

He then told me that if he makes a new web browser and asks me to test it, what all thinks i would test. (again gave me a lot of time to think and tell him as many as i can)

Then WAP to convert binary no to Decimal no.

Then WAP, given a file, find the line in the file which has maximum characters and print it.

### 2nd F2F:

Started with my intro, as i had done internship in my final sem so i told this in my intro , so he asked me to explain what all i did in the internship.

Asked me given an array , find the element before which all the elements are smaller than it, and after which all are greater than it. Asked me approach, didnt want the

code.

#### **Final Director Round:**

Started with my intro.

Discussed my final year project, asked me if it is live as i had made an e-commerce website. so i told him the link , and then he asked me to prove that the website is made by me only, it is not someone else website that i am showing so i showed him the admin panel and he believed it was made by me only.

Then he asked few questions

What is virtual memory?

What is SaaS?

What is Memory Leakage?

What is cloud?

then he also gave me a testing related question. to which i had to think and give all the possible cases i would test.

Basically think vast, think for all the possible cases, take your time, language is not a barrier, Hindi is permitted.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Adobe

### **Adobe Interview Experience for MTS-1 (1.5 Years Experience)**

2 Rounds of online test, one related to aptitude and other is related to c++. Aptitude one had around 39 questions and 2 hours was given. C++ one had 19 questions and 2 hours was given. 7 coding questions and others basic c++ questions.

#### **Round 1(Technical):-**

- 1) There are N nuts and N bolts, u have to find all the pairs of nuts and bolts in minimum no. of iteration (comparision). All the nuts/bolts might have different diameter.
- 2) There is a paragraph having million characters. You have to find out the first non -repeating character in the complete paragraph. For example:- aab cld jb then answer should be :- c
- 3) Any base to any base conversion i.e base 11 to base 7
- 4) Questions related to Multi-Threading i.e synchronization or usage of Volatile (Basic questions)
- 5) Questions related to projects from my resume

#### **Round 2(Technical):-**

- 1) Questions related to Multi-Threading i.e synchronization or usage of Volatile (Basic questions)
- 2) Questions related to projects from my resume
- 3) Garbage collection algorithms
- 4) As I had Java background, so he asked me New features in JAVA 8
- 5) There are chocolates each worth x. You have total amount y with you. And you can exchange z wrappers for 1 chocolate. So in this way how many chocolates he can eat.

#### **Round 3(Technical):-**

- 1) Declare a 2D array using pointer notation.
- 2) A brief discussion about my work.
- 3) Suppose there are packages having volume m and there are n packets having volume a,b,c.... each having volume less than m. So you need to find out the minimum no. of packets required to wrap up the products.
- 4) There are N cities spread in the form of circle. There is road connectivity b/w city 1 and 2, then city 2 and 3 and so on till city n and 1. Each ith city has a petrol pump where you can pick pith petrol and distance between ith and i+1 th city is di . Assume you car has a mileage of 1km/litre. You have to find out if there exist any city, if you start from that city then you can visit all the cities either in the clockwise or anticlockwise fashion.

#### **Round 4(HR Round):-**

Normal HR questions

#### **Round 5 (Director Round):-**

- 1) Questions a bit related about my personal life i.e schooling activites or hobbies.
- 2) Questions pertaining to the best work(projects) that I did
- 3) Things that every software programmer should know and he asked me to convince him.
- 4) What do you do to keep urself updated on the technology.
- 5) Asked me about any open source projects which I had and put in GIT..... told him about all of my projects.
- 6) Few more questions related to technology.

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### Adobe Interview Experience | Set 19 (For MTS)

#### Written round:

Same test every-time.

#### 1st round:

He asked me to write code for hello world in C. Then he asked where this printf is stored and how compiler knows where to check that thing. If printf declaration is moved to the program will it get executed. I told him that I am not aware of these things.

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/> without using extra space.

Design a transaction system for a bank with many atm's across. He asked me if you want to deal with the bank how will you explain them the model and all the software and hardware requirements. He wanted a multithreaded client-server interaction model and the database requirements.

#### 2nd round:

Reverse a string. Reverse a paragraph word-wise.

Inorder and level order traversal and queue operations complexity.

Why inheritance is used. What is virtual memory and thrashing.

#### 3rd round:

Implement a push pop operations in a stack. Implement a queue using stacks. Remember there is further optimization, he asked me for that.

Explain virtual memory and how mapping is done.

Explain multithreading and how global, static etc variables are stored and accessed by threads.

Write complete code for the number of ways a frog can reach nth step by jumping 1 or 2 steps.

#### 4th round:

Replace a string with another string in a paragraph. Which data structure you will use. Complete code.

There are balls of red, blue and green color. How will you sort them.

Implement a generic swap function. I wrote a function which swap the pointers but he wanted me to swap the complete memory blocks not just the pointers.

Indirectly he was asking me to implement memcpy function.

#### 5th round:

Implement a contiguous 2-d matrix dynamically in C.

Spiral order traversal of a matrix. Complete code and he ran it for a 4x4 matrix.

Calculate Fibonacci for nth term. He was asking to optimize the traditional solution.

#### 6th round: Director round

Write a function which returns 1 when 2 is passed and return 2 when 1 is passed.

1 number is missing from an array(1 to n). find that

He just wanted sum of n terms minus sum of array solution.

Now correlate the above two problems.

He asked me what I do at my home after office.

I told him that I read news, quora and some articles. So he asked if I remain updated with the news and then asked me questions like J&K election results, CM of some states and latest android version.

What if I do if I would have everything.

Why not go for further studies.

#### 7th round: HR

Tell me about yourself. Current CTC and notice period.

I would suggest to go through pointers and how the things actually work from scratch like they would ask you to implement any generic library in-built function. Also read OS and oops concepts. If you don't know any topic simply tell them.

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## GATE CS Corner Company Wise Coding Practice

### Adobe Interview Experience | Set 18 (For WBT Profile)

Following is my Interview experience in Adobe Bangalore for the profile of White Box Test Engineer.

### **Written Round**

There were two parts technical and aptitude

1. Aptitude questions(MCQ) were fairly easy,simple mathematical,geometrical problems,profit and loss etc Also Logical questions with paragraph..(R.S. agarwal is enough)

2. 30 Technical question(MCQ) related to C and C++ , 2 programming questions(String permutation and Reversing linked list) , one question about two phase commit protocol and difference between hub and switch

After 30 days of long wait, I got call that I have been shortlisted for the Further rounds.

### **F-2-F Round 1:**

Starts with Brief introduction.

1. Questions related to my previous company work,meaning of Unit testing,Integration Testing,Which Software Model is used etc.

2. Test Cases of Mobile for rural area for hardware as well as software point of view. Long discussion on this.

3. Design a clock in which if you want to know about time in any region of this world, you can know .Hardware given is such that it has already built calculation device inside it. Long Discussion on various approaches.

4. famous Puzzles a) Measuring 4 liter water from 3 and 5 liter. b) 3 bulbs 3 switches, here is the link <http://www.programmerinterview.com/index.php/puzzles/3-switches-3-bulbs/>

After this Next 2 rounds are video conferencing(V.C.) rounds as Hiring was for Noida campus.

### **V.C. Round 2:(Hiring Manager Round)**

Starts with Brief introduction.

1. Write a C/C++ function for removing extra spaces in given sentence.

2. Write a various test cases for checking the functionality of Adobe reader while saving it .Long discussion on it.

3. Find a 3 digit Number abc such that  $abc = a! + b! + c!$ . Ans is 145.He then ask me the approach how i got it.

After this he briefly explain the Job profile in which I have to work if I got selected. He also asked about testing methodology that I have been doing in my current company.

### **F-2-F Round 3 H.R.:**

After Hiring manager round, There was H.R. round. He was a really cool guy. He asked me about previous interviews how it went. Then he asked me about my long term plans if I got selected, about my family, My qualifications etc.

He also asked me about C.E.O. of adobe.

### **V.C. Round 4:**

1. Write a C code for converting a string from a2b2c5 to aabbccccc. Then make it generalize. Various Test cases of it

2. About testing tool that I used in my current company, Various functionality of It.

3. Puzzle : There is a pond in which there is x kg ice on 1st November, it becomes 2x on 2nd November then 4x,8x,16x,32x and so on.Like this whole pond is filled with ice on last day i.e. 30th November. On which day pond was filled with half the ice ?

4. Puzzle: you have 100 coins on table, 60 heads and 40 tails. With your eyes closed, how can you separate the coins into 2 groups such that each group has same number of tails.

5. Write a C function to convert array {1,3,5,7,2,4,6,8} to {1,2,3,4,5,6,7,8}.Then make it generalize. Various Test cases of it.

Many C/C++ concept were discussed on this round like friend function, Inheritance etc.

### **F-2-F round 5:**

Starts with Brief introduction.

1. About some commands in UNIX , use of wild card character etc. Then he asked me how you open notepad without using mouse.(simple),then he explain the internal logic behind this like what will happen if you press ctrl+s,ctrl+o etc. After this He gave me array of strings such that each string must have '\$' character, I have to write a C code to find whether there exist two strings having same character just after \$.(also simple).

2. Difference object oriented concept like function overloading. why C does not support function overloading as there is a concept of variable number of arguments in C? , explain with example.

3. Different searching methods and its complexity, Hashing. How you search words in dictionary?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Adobe

## **Adobe Interview | Set 17 (For MTS-1)**

### **Written Round**

There were two round technical and aptitude

1. Aptitude round consisted 45 questions (50 minutes) except two passage based on logical reasoning rest were easy, time management was important in this round.

2. 20 Technical question 13 multiple choice from OS and C++ , 7 questions were coding related running code were required.

After almost 15 days I got call that I have been shortlisted for the next round.

### **F-2-F Round 1:**

1. Write a program to search an element in a row-wise and column-wise sorted 2-dimesional array .

2. Write a program to convert a binary tree to binary search tree.
3. Two string are given check whether second string are substring of 1st string or not second string may contain wild card character like '\*' and '?'.
4. Many C/C++ related question, concept like virtual function , static variable are discussed.
5. Suggest method to multiply two object(operator overloading , proper code for overloading was required).

**F-2-F Round 2:**

1. Write a Recursive function to reverse a link list.
2. You are given a string in which every character is followed by space u have to return n/2 string that is each character as a separate string ..extra space were not allowed.
3. Many OS related questions Deadlock,Mutex, Semaphore, IPC etc.
4. Many typical C/C++ declaration, memory allocation difference between new/malloc, free/delete and details about how memory allocation takes place.

**F-2-F Round 3:**

HR round

1. Your strength
  2. Weakness
  3. Why adobe
- many more HR questions.

**F-2-F Round 4:**

1. Implement a stack using two queue and queue push, pop operation proper working code were required.
2. Write a function to find 2nd largest element in an array.
3. Reverse a string efficiently.
4. Design a chess game.

3-4 puzzle were discussed one related to time glass, one related to watch , and one related to number this one was really interesting, Puzzle was write an eight digit number in which 0th position represents number of zero in that number, 1st position represents number of 1's in the number , 2nd number represents number of 2's in the number ...so on.

Many C/C++ concept were discussed this interview went on for olmost 1 hour and 20 minutes ..this was director round and fortunately went well ?

**F-2-F round 5:**

1. U have n vending machine out of which 1 is defected find the defected machine in O(1) on solving this he modified it give general solution for the case in which 2 machine are defected O(1) solution were required.
2. U have given a link list make a new link list which is reverse of original link list.
3. Again many C/C++ and OS related conceptual questions and some general discussion on few data structure .

**F-2-F round 6:**

1. Write a recursive function to print directory structure. Two function were given isfolder() and openfolder().
2. Write proper running code for heapsort and some discussion related to that.
3. Asked 3-4 puzzle.
4. Again some C/C++ related question.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

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### Adobe Interview | Set 16 (For MTS-1)

Recently I got the opportunity to be interviewed for the position of MTS-1 at Adobe. Here is my Interview Experience:

**Written Round:**

Part A (50 mins):

45 questions based on logical reasoning, DI, quant and geometry. The questions were easy but the real issue was time in this round.

Part B(2 hrs):

13 MCQs on C,C++ basics (referencing and de-referencing of string pointers ,size of union etc.), OS basics

Coding Questions were:-

- a) Reverse a linked list.
- b) Check if a number is a Palindrome or not.
- c) Multiply two numbers without using \* operator and using minimum number of additions.
- d) Balancing of parenthesis.
- e) Find the row with maximum ones in a 2D array where in each row all 1s occur before all 0s
- f) Check if a given sum is available in an array.

I think it is same from last 3 years and also same for Post Member of technical staff

**F2F Round 1:**

- a) About my projects. Simple Questions.
- b) How a program compiler and run. He wanted answer from scratch.
- c) C++ Questions for what is cout, Object orientation.
- d) Design a ladder and Snake Problem with TWO Player and Code it. I did not have played earlier.
- e) Code for Directory Structure.

**F2F Round 2:**

a) Discussion on Projects. A person can have 1 step, 2 step, or 3 steps. How much combination he can have to climb on a ladder of n and code.

b) Min, push, pop in Stack.

c) C++ Question. VIRTUAL CONSTRUCTOR, virtual destructor significance. Design Pattern related Questions.

**F2F Round 3:**

a) Basic Projects into.

b) In array only 1 element is unique rest are 2 times. How to find that? He further extend if one unique and rest are multiple of 3.

c) Design rate Maze Problem.

d) Loop in a list and how to find out. I said it is a standard question and answer. he asked me. Okk, now tell me why are you increasing fast pointer by 2 only. find the value that should be best match for this.

e) Some of two elements in an Array. Code it.

d) Random Pointer in Linked list. Clone it.

**F2F Round 4: with VP :(:(**

a) A lot of questions about my college. So please be prepare for that too. :P:P:P

b) He showed me my resume and pointed out grammatical mistakes. Project Questions. He asked me every question with deep. What everything mean to regarding project knowledge.

c) Asked my computer science topic which i proud of. By Mistake i said MAPREDUCE. :(:(. I gave him everything by myself.

He asked me to tell what is it. I explained. He was like you understand that but being a IIT product you should know some mathematical form, and should explain in terms of that.

d) Write code for inverted index for MapReduce. Mapper and Reducer Functions.

e) Page-Rank Algorithm, a lot of discussion, asked me to code it. After making a lot of mistake i was successful with his help. He asked me why after running page rank algo, why page rank stabilize after 7-8 turn. (After running page rank algo, page rank of each page become nearly constant, no big change. Why it happens.)

f) My B.tech project, after explaining everything he asked me for mathematical terms, i explained him.

This was the best interview, i have ever had. I learned a lot.

**Fourth Round : HR Round (30 Minutes)**

It was scheduled next to next day.

Thanks geeksforgeeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview | Set 15 (For MTS-1)

Recently I got the opportunity to be interviewed for the position of MTS-1 at Adobe. Here is my Interview Experience:

**Written Round:**

Part A (50 mins):

45 questions based on logical reasoning, DI, quant and geometry. The questions were easy but the real issue was time in this round.

Part B(2 hrs):

13 MCQs on C,C++ basics (referencing and dereferencing of string pointers ,size of union etc.), OS basics

7 coding qustions. Some of which I remember are :

a)Reverse a linked list.

b)Check if a number is a Palindrome or not.

c)Multiply two numbers without using \* operator and using minimum number of additions.

d)Balancing of parenthesis.

e)Find the row with maximum ones in a 2D array where in each row all 1s occur before all 0s

f)Check if a given sum is available in an array.

**F2F Round 1:**

a) I was asked to allocate a 2D array dynamically. I did that. I was then asked to free the allocated memory.

b)Implement an averaging filter assuming a fixed window size on an image. Entire code was required.( We can ignore the border cases). I first did it using a brute force approach. The interviewer then asked me to optimise it. I did it using extra space to store the sum of elements in a fixed window size so that we do not have to compute it for each pixel of the image

c) He told me that for a very large image (2D matrix) the row major traversal is better than column major traversal. Why?

Entire array cannot fit into main memory at same time. Rows are contiguously allocated. Therefore benefits from locality of reference.

d)Questions on virtual memory and paging.

e)Which data structure should we use to represent polynomials and why?

**F2F Round 2:**

a)Implement queues using linked list. Entire working code with all corner cases was required.

The interviewer was impressed as I had handled all the test cases properly.

b)Most optimal code to calculate the number of set bits in an integer. (i.e. O(no of set bits))

c)Difference between process and threads, multiprogramming and multithreading, multithreading and multitasking.

c)Consider there are 9 balls. One ball is defective (might be heavy or light). Find the defective ball in maximum 3 weighings.

I went into the wrong direction as I thought that I had done this before. But he gave me one or two hints and based on that I was able to come to correct answer.

#### F2F Round 3:

a)There are 2 people A and B. Both A and B have equal speed of walking. Both A and B have equal speed of running. Now assume that A runs for half the time and walks for half the time. While, B runs for half the distance and walks for half the distance. Can we tell conclusively who will win in a race?

b)There are two arrays. One contains n digits and the other n-1 digits. How to find the missing digit in the second array?

I asked the interviewer if I can assume that the elements are unique. He said yes. Then I solved it using XOR method. He asked what if the nos are negative or fraction. I said that as two negative numbers or 2 decimal numbers will be stored in the same way in memory therefore XOR will work for that cases as well.

c)Find square root of 'N' without using square root function.

d)Find whether the number 'n' is a palindrome or not. He wanted the best optimal solution with all special cases.

Finally after a lot of hints I was able to bring it down to O(1) space complexity and O(log(n/2)) time complexity. He was pretty satisfied !

#### Fourth Round : HR Round (30 Minutes)

It was an amazing experience as the interviewers were very friendly and made me feel at ease. I would like to thank GeeksForGeeks team for creating such a wonderful portal which helped me a lot in my interview preparations.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

## Adobe Interview | Set 14 (On Campus for Full Time)

**Round 1(aptitude and coding)** Two tests:

**Test 1** (50 mins)

45 questions on analytical reasoning, quantitative and geometry.

Analytical Reasoning Questions were tough, with lengthy and confusing statements.

**Test 2-** (2 hrs 50 mins)

13 MCQs on OS, C, DS, OOP, Computer Architecture

7 coding questions, few of them i remember are:

- a) Reversing a linked list
- b) Check if the given sum is available in an array
- c) Row with a maximum number of ones in a matrix of 0s and 1s
- d) Balanced parenthesis
- e) Multiply two numbers without using \* operator, and minimum number of additions
- f) Check if a number is a palindrome

About 18 people were shortlisted.

#### Tech Interview Round 1:

Tech Interview Round 1:

a) Asked me to implement a 2d bit-matrix representing monochrome pixels which will have only OFF/ON values and will take on an average only one bit of memory for each stored bit (Don't declare an int matrix!), and how to perform various operations on it.

b) Some problems on basic geometry – circles and tangents were given.

c) C programs were given and various OS related issues were discussed regarding them, mainly addressing issues, address space, paging etc.

d) If F() generates 0 or 1 with probability .5 each, generate 0-7 with equal probability.

e)Some in-depth questions on pointers, dynamic memory allocation etc were asked..

#### Tech Interview Round 2:

a) Convex Hull problem

b) given a set of points in a plane, how would you make the most optimized triangular mesh-each point is a vertex of a triangle.

c) Intersection of two lines in a plane, if they intersect- determine the point of intersection.

d) Design problem: without knowing the underlying data structure to store various entities, how would you extend the stl library of c++, which will support any type of queries. Basically he was interested in methods of indexing upon the data and retrieval of relevant information.

#### Tech Interview Round 3:

This round was mostly a design round.

a) Given two machines with different architectures and different endianness, how would you as a programmer make sure that user gets a uniform view of the various files stored. Now if one the files is transferred from one to another, how you're going to maintain that view to the user?

b) Implement the qsort() in c/sort() in c++ library or your own custom sort which will sort any type of data on user defined criteria. write the function prototype, definition and another requirements.

c) How much memory is made available to a user program by the kernel, is there any limit to it? What is the range of addresses a user program can have at max, what determines it?What happens if excess memory is allocated to a user program, say malloc in an infinite loop?

d) What is the difference between mutex and a semaphore. Write down a crude implementation of both. How would you solve the mutual exclusion problem using semaphore. Propose a solution to the readers-writer problem.

e) Other OS related problems.

Last round was the HR round.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe

### Adobe Interview | Set 13 (On Campus for Internship)

We had Adobe visit our campus recently. First they shortlisted students for an online test on the basis of CGPA. A few students even got direct offer.

#### Online Round

There were 8 questions in total. 5 MCQ, 2 Coding and 1 question was based on creativity.

The MCQ's were on heap, and probability. Finding the expectations and the running time complexities for heaps were the main focus of the MCQ's.

In the coding questions we had to write pseudo code, not actual C++ code.

**1st question:** There is a stream of incoming integers, how would you maintain its median using a minHeap and a maxHeap.

(<http://www.geeksforgeeks.org/median-of-stream-of-integers-running-integers/>)

**2nd question:** You have the start time, end time and index number of racers in a race. You need to tell the rank of each racer. The rank is calculated as following: if racer B starts after racer A but finishes before racer A, then the rank of racer A increases by 1.

**Eg.**  
**Index Start Time End time**

0 100 170  
1 80 150  
2 120 165  
3 110 145

**Output**  
**Index Rank**

2 0  
3 0  
1 1  
0 2

I did it in  $O(n^2)$ , but I think there should be an  $O(n \log n)$  algorithm for this.

The last creative question was:

If the 3G wireless network and smart phone penetration in India reached as much as the cellular network penetration, what product would you design and i) how would it benefit the customers and ii) how would you profit? (Write in roughly 200 words).

I was shortlisted for the telephonic interview.

#### Telephonic Interview

I introduced myself, and my projects. He asked me some details of the projects that he found interesting. After this, he asked me algorithm questions.

- i) What is the running time for insertion, deletion, extracting min from a minHeap.
- ii) What is the running time for insertion, deletion and searching an element in a sorted array and the same for an unsorted array?
- iii) How would you determine if a coin is biased or not. Does the degree of biasness effect the number of experiments you have to perform? (Eg, if the prob of heads is 0.6 in one case and 0.7 in another, then would you still perform the same number of experiments to decide if they are biased or different number of experiments).

Thank you geeksforgeeks.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Adobe

### Adobe Interview | Set 12 (On Campus for MTS-1)

#### 1. Online Technical Round (2 hrs)

7 coding problems were given along with 13 mcqs. Coding Problems were very easy.

#### 2. Online Aptitude Round(50 minutes)

45 questions were there. Time was the only limit in this round. Two LR passages, 1 DI problem and rest were quant questions.

16 were selected after the online rounds.

#### 3. Round 1 PI

This round was all about concepts of C, C++, Compiler, Debugging, Design patterns

a. Tell about different sorting algorithms and their complexities. Why so many sorting algorithms present where only one can serve the purpose. Advantages and disadvantages of quick sort and merge sort.

b. What happens when a C program is compiled and executed in details.

c. Where are local variables, dynamic allocated variables, global variables stored?

- d. Where are static variables stored?
- e. Tell me about the design patterns which you know. Which design pattern have you followed in your project.
- f. Write a pseudo code for Singleton Pattern.
- g. Consider the code snippet

```
main()
{
    cout
Without touching the above code snippet print
```

Hi

Hello

Bye

h. Do you want to work for Adobe? Why?

#### 4. Round 2 PI

a. Tell me about yourself.

b. Difference between process and thread. Give me a real life example where thread can be used.

c. Consider a recursive function with no end condition and architecture of your own laptop. What will happen? After how much time will the program crash. (Calculations and performance)

d. Write a client server simple code. How will you handle multiple requests? Will increasing number of threads solve the problem. What should be the optimal number of threads depending upon what?

e. How google handles 1 billion request in 1msec.

f. What is Load Balancer?

g. Real life example where hashmap can be used. Real life example where array can be used.

h. Why do you want to join Adobe?

i. What happened in Microsoft last round? (I was rejected in Microsoft last round)

#### 5. Round 3 PI(HR Round)

Basic HR questions were asked. A puzzle was given where three tires are given which can travel 14, 20, 26 kms. Two tires are required for travelling. Find the maximum distance we can travel with these three tires.

#### 6. Round 4 PI

a. Find the number of occurrences of a key in a sorted array. Handle the base case. Write some test cases for it.

b. Implement a stack where you can search an element in the data structure. He asked me to optimize the solution.

c. Two strings were given. You have to find whether they are permutations of each other. I gave the hashing technique. He then asked me to optimize it.

I thank geeksforgeeks for maintaining such a great site. It helped me a lot while preparing for the interviews.

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## GATE CS Corner

### Company Wise Coding Practice

## Adobe Interview | Set 11 (On-Campus)

Adobe procedure consisted of two online rounds back to back.

1) **First Online Round-** It was Aptitude Test of about 50 minutes and 40-45 Questions were there. The questions were easy and everybody could easily solve that, speed should be good in order to attempt all the questions.

The questions were of type- some geometry based questions,some easy puzzle type questions (like there are 5 painters, one painter passionate about scenic beauty, 2nd painter has interest in... , and other information was given and 3-4 related questions were there),some simple comparison based questions and some quantitative aptitude questions.

2) **Second Online Round-** It was of 2 hours.

In this round there were about 10 coding questions and 10-12 simple c o/p(pointer related) and data structure related question.

Coding Questions asked can be easily found in geeksforgeeks, some of the questions that I remember are-

1) Reversing a linklist.(trivial question which everybody should know).

2) Given a 2-D binary matrix(nxn)(elements are either 0 or 1) such that in each row,all the 1's in the array are present before the 0's.You have to return the row number of the row with max. no of 1's.You just have to implement the function whose prototype looks like-

Int max\_row(int \*arr,int n); //here arr is a pointer to integer and nxn is the size of matrix.

3) Write a program to check whether the number is palindrome or not.

4) A recursive program to multiply two numbers with addition such that there should be minimum no. of recursive calls.

5) Given an array of n integers, find pair of numbers if present whose sum is equal to a given target sum.

6) Every number with 3 at it's unit place has a multiple which has all 1's like for 3,the multiple is 111,for 13 multiple is 111111.The multiple can exceed the integer range i.e,it can be very large number(try storing it in a string).

7) Given a mathematical expression, check whether the parenthesis used in that expression are balanced or not.Possible parenthesis used can be {},[],() only.Eg.  $(2+3)/4*[9+(8*5)]$ .

8) Three processes p1, p2, p3, p4 – each have sizes 1GB, 1.2GB, 2GB, 1GB. And each processes is executed as a time sharing fashion. Will they be executed on an operating system.

9) One question was from scheduling in OS.

### Technical Interview 1

In this round,firstly the interviewer asked me about DNS server(full working), ARP protocol etc.

We had some general talks regarding my achievements, then he gave me a problem- There is a string which may contain repeated words, you need to print unique words only.(I gave a solution using trie but he wanted brute force solution...:( )

Then he gave a puzzle which I had never heard before(you can search it- "King's poisonous wine cellars").

He was also asking approach for some of the questions asked in written exam.

### Technical Interview 2

In this round,first of all I was asked some networking questions,then virtual memory concepts,some scheduling questions etc.

Then he gave me a problem which I had to implement in C.The problem goes like this- There is an application which is again and again fetching data from database and then using that information in further processing.but since the application is again and again accessing the same database so inorder to increase the speed of accessing data we have to implement a cache.(Property of cache-keep the most frequently used data and remove the least frequently used data if cache is full,assume limited size of cache).

Solution that I first gave was using a linklist (wrote all functions inC)

He was happy with the solution but wanted me to think about more efficient solution so I told him using Heap and Hashing,implemented it in C again.He was impressed by this solution ...:)

### Technical Interview 3

In this round he asked me about DHCP,DNS working protocols etc.(I wrote these terms in my resume).He asked about unions,bitfields,structures,asked me to write 6-7 complicated declarations,asked me the meaning of some declarations((like int \*const \*const \*i)).Then asked C++ Questions about default functions in C++,how would you detect that error has occurred inside the constructor and destructor,lots of c/c++ output questions.I was also asked about reimplicit cast etc. but since I never studied so I simply denied>If you don't have any idea about something or heard the term for the first time,it's better to simply tell that u don't know that,rather than fooling around..).

Output questions were easy if you have done 295C Questions and GeeksForGeeks C/C++ Output Questions.

### HR Interview

My third technical and HR Round were scheduled on second day and after my third tech. round I got more confident which really counts in HR round.You should be really confident about each and everything you speak and kindly think before speaking something so that he may not be able to trap you.

First of all he asked my iit rank and AIEEE rank, then why among all the options I chose this college, then tell some unique and different quality that you possess so that i should hire you(he warned me not to say words like honest, hard-working, determined etc., it should be something unique also think of a situation if u could fit in with that quality), why adobe?, what is my weakness and how will I overcome it, then he gave me a puzzle to solve. Also I forgot to add the most common question which you are asked if interviewing in adobe and you are not among the toppers, where do you stand(rank) in your class, what is the reason of your low pointers(prepare a genuine answer to this question).

In the end all went well and in my favor and I got recruited for the company. I really want to thank geeksforgeeks because of which I am at this position. It is really a great platform where you could find lots of problems to practice and these are repeated by many of companies in their coding round and interviews.

I hope that this experience of my interviews might prove helpful to some of you.

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### Adobe Interview | Set 10 (Software Engineer)

Written:

Aptitude: Objective 50 min 45 questions

LR- 2 passages-5 each

DI- 1 paragraph- 5 each

Mathematical

Exactly same paper at this link

<http://www.gohired.in/2014/03/adobe-aptitude-c-language-written-test.html>

Easy only. Just time concern for those who are out of touch. My suggestion will be to do the LR in the end.

**Java WhiteBox test:** Subjective 45 min 20 questions

java-15

j2ee-5

- 1) What is package and how is it used.
- 2) When is thread's run method invoked.
- 3) What is synchronised method and synchronised statements
- 4) What is the difference in class hierarchies of Reader/Writer and InputStream and OutputStream
- 5) What is transient
- 6) Which is illegal

int i=0;

float f=45.0;

double d=49.0;

7)

```
StringBuffer sb1 = new StringBuffer("Amit");
StringBuffer sb2 = new StringBuffer("Amit");
String ss1 = "Amit";
System.out.println(sb1==sb2);
System.out.println(sb1.equals(sb2));
System.out.println(sb1.equals(ss1));
System.out.println("Poddar".substring(3));
```

- 8) What are wait(),notify(),notifyAll()
- 9) what is finally in try-catch-finally blocks
- 10) What is thin-client application
- 11) Difference between >> and >>>

O/P questions related to string.concat, equals methods. Error pointing codes with options

**F2F Round 1:(1.2 hr)**

- 1) Brief intro about work.
- 2) Why do you want to shift when Mobile (and ecommerce) are already the most happening things.
- 3) Test cases for mail attachment(word doc) not being opened scenario
- 4) WAP to convert a binary to decimal.(i wrote by taking the parameter as String, he asked me to do by taking as int)
- 5) WAP to print sum of first 'n' prime numbers
- 6)

```
String s = "Hello ";
s+= "Adobe ";
s.trim();
System.out.print(s);
```

What is the output?

- 7) Explain a project you have been recently been part of and what are the test cases you have gone through.
- 8) What is the testing framework you have used in Android.What is the approach you follow while testing any product.How do you test a method which does not return any value.
- 9) What are the operating systems you have worked on.Do you know Unix.
- 10) What are the main things that you need to look at while making a mobile application to that of a desktop application
- 11) What is the toughest bug you have fixed.
- 12) What is memory leak
- 13) What is the difference between instance variable and local variable
- 14) If i write java in command prompt from anywhere in system, will it work?If not, how to make it work.
- 15) Why is the class name same as filename in Java.Is there any use.
- Can a file have more than two classes.What will be the name of that file?
- How many class files will be generated when we compile.
- 16) Why is Java platform independent.
- 17) Is JVM platform dependant?On what factors it depends?
- 18) What are the best practices you have followed in your project.

He asked me if i have any questions.I asked more about the role and team. He explained in detail about the team and also about Adobe subscription model.We had a general discussion over this business decision.

**F2F Round 2:(30 min)**

- 1) Brief intro
- 2) WAP to find out factorial of a number  
He asked for recursion as well.  
Asked me to write the testcases and handle the overflow condition and border cases in the code.
- Discussed which approach is better and when to use which.
- 3) Do you know Unix
- 4) Do you know any other mobile platform apart from Android. Do you know any application platform which enables building apps across channels (desktop, android, ios, cloud...)  
He asked me if I have heard about PhoneGap and later explained it. He asked me if I have any questions. I asked if they have a mobile team separately. He said yes and explained their work a bit.

**F2F Round 3:(1 hr)**

- 1) Brief intro
- 2) What is binary search.
- 3) Write a code for ternary search. Is it better than Binary? He asked me to generalize the search and asked me which is the optimum.
- 4) What is registry.
- 5) Do you know Unix
- 6) I have a hard disk of 100 GB. It has one and only file of 80 GB (database backup).  
What happens if I delete it and it goes to recycle bin.  
Follow-up questions:  
Is the memory freed from the hard disk.  
What happens if I move it from one drive to another.  
What happens in case of permanent delete.  
What happens when we format the disk.
- 7) What is virtual memory.
- 8) Puzzle: 10 containers with 100 balls each but one container defective. Find out the defective container in minimum weighings.

He asked me for questions. I asked them if there will be option to shift to developer position. He said yes and explained about their open culture. Also explained how they interact and work closely with developers.

**Director round:(40 min)**

- 1) How was the day.
- 2) What is the most interesting question you have been posed today.
- 3) What is it that you have learnt today.
- 4) Give me a brief about your work.
- 5) Why do you want to shift from Development to Testing.  
He said he will concentrate on only problem solving, aptitude and attitude-
- 1) Gmail wants to provide a new enhanced service which offers auto-backup, promotional mails filtered, extra space for mail box etc which costs 50 rs per month.  
They want to run a provisioning program which shows a popup to certain customers having options-
- 1) Yes and then redirected to payment and all
- 2) Remind me after 2 weeks.
- 3) No
- 4) Not happy with the service offered.

Asked me to test this model.

Later he asked me the factors which I will consider for choosing set of customers for this program.

- 2) Have you worked on Unix.
- 3) What is registry.

I have installed msword in my pc. Copied the C:/program files/ folder into pen drive and pasted in another pc. Will it work? Why /Why not?

- 4) What is SaaS. Examples.  
There is one fb user in India and another in US. When they communicate, do they connect to same server. If not then how does the communication happen? What is the data that is being transferred.

This round felt like a stress test and went very badly. Couldn't ask for any good questions when he offered.

(My suggestion will be, answer only if you know and you are sure about it otherwise don't even try)

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Interview Experiences  
Adobe

## Adobe Interview | Set 9

Experience: 8 months

**Online Written Test:**

Given interviewstreet links of two tests. 24 hr. time-line to finish both tests. Tests are independent, can be given at any-time on that day in any order.

1. Duration 120 min.  
Basic C, OS 20 multiple choice questions  
7 coding questions
2. Duration 50 min.

40 low level maths aptitude and LR questions

After a week, received call for onsite interview rounds at noida office.

4 technical rounds + HR:

**1st round:** (manager level guy)

little intro to give it a start

why do you want to leave so early (Graduated in 2013 so its only 8 months)

Should I evaluate you as freshers or experienced ? (because my previous work was bit of non-technical)

1.(Bit manipulation/bit masking)

Given a M\*N size tv screen. Colour of each pixel is integer value b/w 0-7 (i.e. 3 bits to represent colour)

screen is tightly packed bits(no byte padding allowed). now given a (i,j) index of pixel change its colour ?

Basically screen is matrix but in memory its represented as 1-d array.

character array can be used to represent each bit.

Hint:

map matrix (i,j) to 1-d array and change 3 bits to change colour.

problem arise when 2 bits are in one byte and another 1 bit is in another byte.

2. Process vs threads

3. One question to check whether i have idea on address space of process and threads

(based upon threads share data and heap but have separate stacks )

4. How realloc() work in C.

**2nd round:** (4-5 years experienced guy)

1. Given an integer N . tell if it is power of 3 or not.

2. Given infinitely long character array.

replace all occurrence of particular word with another word of larger length. Solution should be inplace can do copy only one time.

e.g.

Gandhi was born in 1969. Gandhi was from gujrat.

replace gandhi with mahatma

3. Given a binary search tree delete any node in tree.

one more question...

**3rd round:** (4-5 years experienced guy)

1. Given sorted 2-d array of integers i.e. row wise and coloum wise sorted

Search for given number in array.

2. Given an circular linked list. convert it into non-circular . no link or data can be changed.

(basically find start node of circular list and de-link it )

3. Given an integer array find two numbers with sum equal to K.

one more question...

I finished this round early so he chated about which system you use.(windows or linux)

what is difference b/w this two.

You had 4 gb RAM or 8 gb RAM ? how RAM size affect user perspective ?(want to know i have general idea about virtual memory or not)

**4th round:** (highly experienced old guy)

Given sorted 2-d array of integers i.e. row wise and coloum wise sorted

Search for given number in array.

I told him i already solved this in previous interview.

then he extended same question.

Insert a number in this array.

Delete a number in this array.

Only this question,because we had wide discussion about various approaches.

**HR round:**

Didn't happen because HR was in urgent critical meeting.

After 2 days got a call from HR that I was selected for Adobe ☺

Thanks you geeksforgeeks team for making my preparation smoother.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe  
Interview Experience

## Adobe Interview | Set 8 (Off-Campus)

Experience : 8 months

**First Round :**

Held on interview street .Aptitude + technical (standard pattern and questions)

**Second Round (f2f):**

Started of with the discussion of trees. Like what is a tree/BST ?

Implement insertion in tree (Java).

Discussion on projects.

Search time complexity in BST/ ternary tree.

Link List v/s BST

**Third Round (f2f):**

Implement a generic binary search algorithm i.e. the input array may contain int, double or structure values.

How does strtok() works. How can you make it thread safe.

Given an array, find number of pairs which equal to a given sum.

Question on singleton pattern.

**Fourth Round(f2f) :**

A building has n steps. A person can take 1,2 or 3 steps. In how many ways can a person reach top of building.

General discussion on cache.

You have a stream of incoming integers. How will you store these numbers and implement following functions : GiveMax(), GiveSecond Max(), Delete Max(), DeleteSecondMax (), Add , Remove an element.

I couldn't make it beyond this round.However, this was my interview experience.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe  
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## Adobe Interview | Set 7 (On-campus for MTS-1)

First of all, I would like to sincerely thank the entire GeeksforGeeks team for creating and maintaining such an awesome site. GeeksforGeeks has tremendously helped me in my preparation for the on-campus interviews and finally cracking the job interview for Adobe.

Type of Interview: On-Campus for MTS 1

No of rounds: 1 apti + 1 written + 4 PI

**Aptitude Round: 1 hour**

There were 15 questions on LR followed by 30 questions on DI. The questions were similar to those asked in management examinations like CAT.

The results were declared after a couple of hours and around 50 odd students were selected for the written round.

**Written Round: 2 hours**

It was divided into two sections :

Section 1 contained 10 questions including a couple of questions on OS and the rest were common programming questions.

Section 2 had 10 syntactical questions on C/C++. I guess most of them can be found on GeeksQuiz.

15 students cleared the written test and were to attend the PIs the next day.

**PI Rounds-**

**1st Round: 45 minutes**

1. Had a general discussion about various data structures. Comparison of BST and hashmap ( relative advantages and disadvantages ). Applications of each.

2. Implement a queue using 2 stacks. Then optimize the implementation.

3. Suppose we have two functions void g() and void h(). The function h() has been called somewhere in the body of g(). Now using a debugger, we find that that the program crashes as soon as the return statement in h() ( at the end of function h() ) is executed. There is nothing syntactically wrong with the program. How will you debug the code ???

My answer : The function h() has modified the return address on stack.

4. The last question was a puzzle. You have 7 coins out of which one is fake. Find the fake coin in minimum number of weightings.

**2nd Round: 45 minutes**

1. The round started with a rigorous discussion about various OS concepts, specially virtual memory and demand paging.

2. Implement a stack using 2 queues. Now optimize the implementation.

3. A robot can walk on 1 step or 2 steps. Find the number of ways in which he can reach the nth step.

I started with the naïve recursive solution. He asked me to draw the entire recursion tree and hence manually find the answer for n=8. I asked him to make it n=5 ☺ I pointed out the overlapping sub-problems and gave him the DP solution. He also asked for time and space complexities of both the solutions.

4. This question was related to what he called conditional operator on an image. I had no idea what that was. So he explained it to me.

A monochromatic image is represented by a MxM matrix Image0. We have another WxW matrix Op ( W3rd Round: 45 minutes

1. Fibonacci series. Just the recurrence relation and derive the time complexity of recursive implementation.

2. Write a function that takes n parameters and returns an n-dimensional array using those parameters as the dimensions. The expression `a[i1][i2]...[in]` should work. For 1-d array, it's trivial. For 2-d arrays of dimensions `mxn`, first create an array of m 1st-level pointers and for each pointer allocate an array of size n. He asked me to do it for k-dimensional array where k is a parameter. The real issue was implementing k nested loops, where k is not a constant value. I was able to implement it using a single loop which runs from  $i=0$  to  $i=k^k - 1$ . For each iteration, I calculated the various nested loop variables, say  $\text{par}(L)=i \bmod k^{(L+1)}$ , where  $L=0$  represents the innermost loop and  $\text{par}(0)$  represents the innermost loop variable. So when  $\text{par}(t)=0$  for some t, it's obvious that either  $i=0$  or the immediate outer loop, ie the loop  $L=t+1$  has moved on to its next iteration. So the malloc statement between the loops  $L=t+1$  and  $L=t$  has to be executed. The interviewer was very impressed with the approach.

3. The question started with the interviewer asking me to write a program to print "Hello World". I just stared at him for a while. So he repeated the question 😊 He then wanted to know what the compiler does when it encounters the statement `#include`, whether the `stdio.h` file contains just the function declaration of `printf` or the definition too. Then we had a discussion on static and dynamic libraries.

#### 4th Round(HR Round): 20 minutes

Was asked typical HR questions like why do you want to join Adobe, your dream companies, why not go for a higher education instead of a job, what do you like to do in your free time. When I told him that I was a sci-fi fan, he asked me that assuming I had the resources, how would I design an iron-man suit 😊 Needless to say, I really enjoyed this round for multiple reasons 😊

Finally, the results were declared and 5 students including me were hired 😊

This article is compiled by Saikat Chakrabarty. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe  
Interview Experience

## Adobe Interview | Set 6 (On-campus for MTS-1)

I would like to thank the entire Geeksforgeeks team, whose contribution has helped me a lot in my preparation for the interviews and getting placed at Adobe.

**No of rounds:** 1 apti + 1 written + 4 PI

**Aptitude Round:** 1 hr

15 questions on Analytical Ability, 30 questions on Data Interpretation and Quantitative Ability

**Written Round:** 2 hrs

10 questions on Algorithms and OS, 10 questions on output of C/C++ code snippets

**PI Rounds-**

**1st Round: 45 minutes**

1. Implement a queue using 2 stacks( average time complexity O(1) for push and pop )

2. Discussion regarding demand paging. Then the interviewer asked me to give a detailed implementation of demand paging, using object-oriented approach, considering everything from page tables to swap disk I/O to page replacement policies.

**2nd Round: 45 minutes**

1. This round started with a puzzle: There are two buckets- one having 100L water and another having 50L milk. A spoonful of water is taken from 1st bucket and added to 2nd bucket and the mixture is stirred, now a spoonful of the mixture is taken from the 2nd bucket and added to the 1st. Compare the final volume of milk in 1st bucket to the final volume of water in 2nd bucket.

2. Defective ball puzzle: Find defective ball among 7 balls using minimum no of measures.

3. A system sends multiple queries to find all primes between two given numbers. Provide service to each query in less than O(p) time(p is total no of primes)

Solution: Perform Sieve of Eratosthenes initially and maintain list of primes. For incoming queries, use binary search to find first and last primes between given numbers.

4. A modification of Towers of Hanoi problem: Consider 3 towers A(source), B(auxiliary), C(destination) and n discs. All usual constraints of the original problem hold true, but a new constraint is added: No disc(s) can be moved directly from A to C or from C to A, B has to be used in between.

Solution: For n discs and towers A,B,C as source, auxiliary and destination respectively, consider the following function:

```
Move(n discs, A,B,C)
{
    If(n==1) print(nth disc, A->B->C);

    Else
    {
        Move(n-1 discs, A,B,C);
        print(nth disc, A->B);
        Move(n-1 discs, C,B,A);
        print(nth disc, B->C);
        Move(n-1 discs, A,B,C);
    }
}
```

```
}
```

It will take  $O(3^n)$  time instead  $O(2^n)$  as in the normal Towers of Hanoi problem.

The interviewer seemed quite impressed with the solution.

### 3rd Round: 45 minutes

1. A robot can move forward either 1 or 2 steps. Find no of possible ways to reach nth step(easy DP problem).
2. Questions regarding scheduling concepts, how cpu burst length is predicted for SJF scheduling, exponential averaging, etc.
3. The interviewer asked me to implement my own timer service in the user-space. Using system timer countdown was not allowed, only reading current system time was allowed.

Solution: Create a high-priority helper process P which will have some idea of flow of time(since we cannot use hardware timer) and hence will act as a sand clock for any process that requires timer service.

P will have the following operations:

```
t1=getSystemTime()  
do dummy op(which should take very less time)  
t2= getSystemTime()
```

$(t2-t1)$  will be the time unit for P. Whenever any process requires a countdown of time t, it will communicate with P and request it to send a signal after time t. P will divide t by its time unit and perform dummy its operation  $t/(t2-t1)$  times and then notify the requesting process that the time period has elapsed.

The interviewer said that the solution was coarse, but still he seemed pleased with it.

### 4th Round(HR Round): 15 minutes

Normal HR questions like: why do you want to join Adobe, what were the most challenging situations you have faced in your career so far, where do you see yourself in 5 years, etc.

After the final round, the results were declared. I along with 4 of my peers were hired!!!

This article is compiled by Biswarup Pal. 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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## Adobe Interview | Set 5

### 1st Round(Written Test)

Consists of three sections with each section 1 hour to solve. Hence the written round was for 3 hours. I really liked the written round since it consists of everything starting from writing code(LCA, GCD, Middle of Linked list), Number conversion, Reduction of Boolean functions, Prefix to Infix Expression and evaluation of expression algorithm and finally aptitude.

The written round consists of more or less everything one could imagine and it is far better than other companies like Amazon or Microsoft. But of course, Adobe does repeat questions .

Adobe's Interview Process was very good since in this month, I had given interviews of Amazon, Samsung, GoldMan Sachs and Fab which I have already shared with GeeksForGeeks. What I Like about their interview was their way of perception, they were judging people based on thoughts and not just bookish answer. In fact, one of the interviewer was rejecting people if you give a book answer.

### 2nd Round(Technical Round)

- a) Heavy discussion on Merge Sort, Amortized Analysis of Heap Sort – Made me solve recursion etc
- b) Made me write the complete code for dictionary of words(Trie data structure)

### 3rd Round(With Director)

This interview had only one question and it went on for atleast 1 hour. It was a OOPS Design question

a) Serialize and deserialize the object in an optimized way( I gave him the idea of Spill overflow etc). I actually took a deep dive by optimizing in bit level) . After the algorithm, he made me design a library such that if there are 100 clients to my lib, it should be maintainable and flexible.

It was a subjective answer but since I have 2 years of Work ex in C++. I did give him a nice design.

### 4th Round(Technical)

- a) Design an LRU cache
- b) Write C program for tail command of Unix using dynamic behavior
- c) And then discussion started on my projects. It was again depth of C++ programming

### 5th Round(Puzzles)

- a) Only puzzles were there in this round. And all the puzzles could be found on net

## 6th Round(Technical)

- a) Implement a generic Object Oriented Stack
  - a. Considering algorithm wise I explained him repeated doubling and linked list implementation.
  - b. Design wise, templatized the answer with heavy use of virtual functions to make the code generic and maintainable over a period of 2 years. Debate on what should Pop return when we template it ?
- b) Reverse a string word by word in place without using the swap function. The string is not-editable. This question was tricky as he kept building the question with constraints. But I really enjoyed it

## 7th Round(HR)

Finally after many interviews I got through Adobe. I did have offers from other companies but Adobe was paying well. I thank Amazon for rejecting me else I wouldn't have even sat for Adobe 😊

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## GATE CS Corner Company Wise Coding Practice

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## Adobe Interview | Set 4

Date Of Interview: 3rd December 2012

No. of Rounds: 1 Written exam + 4 rounds of PI

Type of Interview: Campus Interview for freshers

### Written Round

The written round consisted of three sections 45 min each. The first was an objective type which consisted of 30 MCQs on basic Mathematical and Logical problems. Then there were 2 subjective papers each consisting of 10 questions. One was based on C programming and the other on basic engineering concepts.

### Interview Round 1

Model a datastructure for a DFA that takes an event as parameter and performs a desired action.

Write a code that efficiently counts the total Set Bits in a number.

Write a code that efficiently calculates  $X^{power\ n}$  where x and n are integers.

Write a code that efficiently calculates the nth term of Fibonacci series (He wanted a logn solution).

### Interview Round 2

What is Synchronization? What is Mutex? Reader Writer Problem

There are 25 horses and a track which can race 5 horses at a time. Find the top 5 horses in minimum number of races. Assuming best horse always wins.

Write a function to check if a singly linked list is a palindrome.

### Interview Round 3

What do you know about Volatile keyword explain with an example code.

Declare an array of function pointers that return a pointer to a func that in turn return a pointer to a char array.

Given a Roman notation of a number convert it into its decimal number. Write a function to do this.

Given a string, find the length of the longest substring with distinct characters.

What is Paging and why is it used?

### Interview Round 4

HR Round: Normal HR questions

HIRED!! 😊

Many Many congratulations to **Saransh**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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# Adobe Interview | Set 3

Following is Adobe (**Testing**) experience.

## 1st round:

- What do u know about adobe..
- Changes u want to make in adobe reader (as i said adobe reader is my fav)
- Why testing and y not developing
- Your interest (as my fav sub was os)
- What is the difference between win 8 and win 7
- What is the diff between thread and process
- When u open a new tab in browser, the new tab is a thread or process(questions related)
- Test case for bottle
- Test case for stapler
- Program to check syntax of string

## Puzzles:

- Cut round cake into 8 equal pieces u can use knife only 3 times
- 8 marbles puzzle(very famous)
- Given a crescent moon shape. Cut it into 7 parts with 2 cuts at max.

## 2nd round:

- Program to print last nth element of linked list in single traversal
- Program to create mirror image of binary tree
- Rope puzzle(famous)
- Difference between static and dynamic linking in terms of binary code.
- Given n people in a room. Each one shakes hands with only those people who are known to him. You have to prove that there will be at-least two people among them, having same number of shake hands.

## 3rd round:

- HR, normal n frank

## 4th round :

- Puzzles:
- 25 horses puzzles(famous)
  - Hour glass puzzle(famous)
  - You have to assemble a computer, with minimum cost. check if it is running the boot strap program.

Many Many congratulations to **Saumya Varshneya**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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# Adobe Interview | Set 2

I have recently been through the recruitment process of ADOBE. I didn't get through (I got the reply today), but I sincerely hope that my experience will help some of you in your endeavors.

**Round 0: Written Test** – I was called for a written test. The test was 3 hours long. It had four sections – Quantitative, Analytic, Data Structures and Algorithms, and Core Java & J2EE fundamentals

The questions were simple. The paper had a time limit for each of the individual sections but somehow the HR collected the answer sheets (and the question papers) all together at the end of 3 hours.

There was no negative marking but they had a different weight-age for questions in each section

Quantitative: 30 multiple choice questions. Time limit: 45 minutes

Analytical: 3-4 Analytical Puzzles followed by 4-5 follow up questions (multiple choice). Time limit: 15 minutes

Data Structures & Algorithm: 10 questions (not multiple choice) to be answered with a brief explanation. Questions like 24ABC in base 6 would be what in a base 7 system. Write a program to find the missing number in an array of size N-1 which had jumbled up numbers ranging from 1 to N. I hope you get the idea.

Core JAVA & J2EE – The Core JAVA section had general questions on JAVA. They stressed a lot on threads.

I dint know much about J2EE but the whole paper had just 6 questions on it, so missing them didn't cost me much.

Almost a week later the HR informed me that I had done really well in the test and that I have to come to the ADOBE office for the first set of interviews.

## Interview 1

1) He gave me a custom PERSON object. This object had some properties like name, surname, age etc. He asked me to write a function which can return the size of this object. He asked me to write a generic code that will work with any object. The object may have inbuilt data types like in the PERSON object or it may have another custom object inside it such as a FAMILYBACKGROUND object. He gave me a few functions from the JAVA API which can tell you about the contents of an object. He asked me to write a helper function that can return the size of default data types like int, float etc.

2) He gave me a sorted but rotated array and asked me to find the pivot.

## Interview 2

- 1) He gave me a sorted but rotated array and asked me to search an element inside it without finding the pivot. Complexity of the solution should still remain O(Log n)
- 2) Find the mean and median of the elements which are dynamically added at runtime.
- 3) I have a list of N teams T1, T2, T3 ... Tn. Each of these teams has played a match against every other team. I have a function displayResult(Team T1, Team T2), it returns the team which won the match between any two given teams T1 and T2.  
I have to write the teams in an order such the (n-1)th team (in the order) had lost to the nth team which in turn had lost to (n+1)th team..  
For example if in a particular order, the teams appeared as T1, T2, T3, T4 ... then team T1 had lost to T2, T2 had lost to T3, and T3 had lost to T4... It may be possible that T3 lost to T1 .. but that need not be taken into consideration while writing the order. Only the neighboring elements should be such that the element on the left has lost to the element on the right.  
How will you write the teams in this order? Write a code for it  
Make all the necessary assumptions you need to solve the problem.

- 4) Print an order of all the knight moves such that it fills up an 8 by 8 chess board. The moves should be such that no block that has been stepped on is visited again.

After a few days, the HR informs me that I have qualified for the next round. Only this time my interview will be taken by some of the senior executives at ADOBE.

#### Interview 3

- 1) General discussion about the work done in projects, internships etc.
- 2) What is reflection? How does JVM find the right class to instantiate an object?
- 3) Draw a Pascal triangle. Write a code to print the elements of an N level Pascal triangle using a 1 dimensional array.

#### Interview 4

- 1) Generate all possible combinations (of r elements) inside an array of size N  
E.g. arr [] = {2,8,14} All possible combinations of r=2 will be {2,8}, {8,14}, {14,2}
- 2) Why are string objects immutable in java? How are Strings structurally designed in java?
- 3) When should one use merge sort and when should one use quick sort?

#### HR

General questions like if selected which office would I like to work for? Where do I see myself 5 years from now? etc etc...

I stumbled on the interview questions in the fourth round (Probably why I wasn't selected).

Please post if someone has answers to them.

Best of luck.

Source: <http://www.geeksforgeeks.org/forum/topic/adobe-interview-8th-september-28th-september-2012>

Thanks to ganglu for sharing 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe  
Interview Experience

## Adobe Interview | Set 1

Following are the details of Adobe Interview.

#### Round 1

1. How will you implement a stack using a priority queue. Push and pop should be in O(1).
2. Three mislabeled jars problem.

#### Round 2

1. How does stack look in function calls? Given a recursive function call, how will the stack look like?
2. When does stack (process stack) overflow? What are the remedies?
3. What are balanced BSTs. Then he randomly gave me various numbers and asked me to create a BST. And to balance it.
4. Advantages of linked list over arrays. And arrays over linked list.
5. How are vectors implemented internally in the library. This question revolved around dynamic implementation of arrays. Then discussed the amortized time of the operations using dynamic implementation of arrays.

#### Round 3

1. There was a question in written round that there is a global static variable 'lock' initially set to 0 and there was a code segment given.

```
while(lock);
lock = 1;
//Critical section
lock = 0;
```

Does this solve critical section problem. I answered that it will solve in uni processor system but not in multiprocessor system. Then he asked me to explain my answer. After a long discussion we came to a conclusion that this wont even solve in uni processor system. Then he asked me the solution to solve this. I did that using testandset instruction.

2. When a function is called in thread, what variables can be accessed from it. There was a long discussion on this too. I went in the wrong direction but corrected myself later. Stack variables are copied but heap variables are same.

#### Round 4

1. What data structures will you use to implement a text editor. Size of editor can be changed and you also need to save the styling information for all the text like italic,

bold etc.

#### Round 5

HR Round: Normal HR questions.

Source: [Adobe Interview Questions 2013 Batch](#)

Thanks to Suresh for sharing Adobe 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Adobe  
Interview  
Interview Experience

### [TopTalent.in] Exclusive Rapid Fire Interview with Deepali Who Got Into Facebook



Even if we were to search around the world, it would be a truly difficult job to find someone like Deepali. As a Computer Science Graduate of IIT Bombay, she successfully bagged a job offer from an astounding company – Facebook. Even though it's a rare feat, she doesn't consider it a rare one. We at [TopTalent.in](#) got a chance to interact with Deepali Adlakha from IIT Bombay about what made this possible and what others can learn from this.

In case you are wondering how the resume of a Facebook recruit looks like, you can [download](#) the resume by logging in.

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

I don't consider it as a 'rare' feat, many people have got such good offers in both present and past.

**TopTalent:** What other offers did you get apart from Facebook?

Facebook was one among my top preferences, I got the offer from Facebook and hence I was out of the placement process. So, one does not get more than one offer.

**TopTalent:** Can you brief us the interview process?

Facebook had one coding test, after which there were three rounds of interview. All the interviews tested your technical knowledge.

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

I gave interviews to Facebook, Google and Microsoft. In all interviews, the student is tested on his/her thought process, how he/she arrives at the answer rather than just the answer.

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

I practised coding, answering algorithmic design questions. I had a rough overview of all my courses, hence I didn't spend much time revising them.

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

A student should know how to code, both on paper and on the system, that is it.

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

I used Hackerrank and Codechef for practicing problems.

**TopTalent:** Were grades a factor in you getting selected?

Good grades is definitely a plus point, but it is neither necessary nor sufficient.

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

Relax and prepare hard. You will get what you wish for.

Incase you forgot, you can [download](#) the resume by logging in.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Facebook  
Toptalent

### Facebook Interview | Set 2 (On Campus for Internship)

Recently facebook visited our campus. There was an online round first. 7 people were shortlisted for the telephonic interviews. And then there were 2 telephonic interviews taken by people from the US.

### Online Round

2 coding questions were given, and the time was 75 minutes.

1. There are n trees in a circle. Each tree has a fruit value associated with it. A bird can sit on a tree for 0.5 sec and then he has to move to a neighbouring tree. It takes the bird 0.5 seconds to move from one tree to another. The bird gets the fruit value when she sits on a tree. We are given n and m (the number of seconds the bird has), and the fruit values of the trees. We have to maximise the total fruit value that the bird can gather. The bird can start from any tree.

I forgot the examples, sorry:(

2. You are given the encoding for a base 58 number. You have to convert all the numbers from 1 to n to a base 58 number using the encoding given.

The questions were not difficult, and the shortlisting basis was very strange. My friend finished much before me, but he was not shortlisted. I think they looked at your CV and projects.

### 1st telephonic round

Introduce yourself and tell me about your projects. Then he asked me 2 algorithmic questions.

1. You are given the start time and finish time of n intervals. You have to write a function that returns boolean value indicating if there was any overlapping interval in the set of existing intervals. (Sort and check, time complexity O(nlogn))

2. You have 2 sparse vectors (large number of 0's). First tell me a way to represent and store them, and then find the dot product.

(To store them, we should store the value and index of those indexes that have a non-zero value, and then finding the dot product is very straight forward).

### 2nd telephonic round

The interviewer was not the same. Introduce yourself and tell me about your projects. Even he asked me 2 algorithmic question.

1. You have an array of n elements, and a sum. Check if any 2 elements in the array sum to the given sum. ( Expected time complexity O(n). Use hashing)

2. Extended the previous problem to sum of 3 elements in the array summing up to the given sum.

A few pointers:

? Always explain what you're doing and why.

? First explain the algorithm and then start coding.

? If he gives a hint, take it and use it.

Thanks [geeksforgeeks.org](http://geeksforgeeks.org)

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.

## GATE CS Corner Company Wise Coding Practice

[Internship](#)  
[Interview Experiences](#)  
[Facebook](#)

### Find all possible interpretations of an array of digits

Consider a coding system for alphabets to integers where 'a' is represented as 1, 'b' as 2, .. 'z' as 26. Given an array of digits (1 to 9) as input, write a function that prints all valid interpretations of input array.

Examples

```
Input: {1, 1}
Output: ("aa", 'k")
[2 interpretations: aa(1, 1), k(11)]
```

```
Input: {1, 2, 1}
Output: ("aba", "au", "la")
[3 interpretations: aba(1,2,1), au(1,21), la(12,1)]
```

```
Input: {9, 1, 8}
Output: ("iab", "ir")
[2 interpretations: iah(9,1,8), ir(9,18)]
```

Please note we cannot change order of array. That means {1,2,1} cannot become {2,1,1}

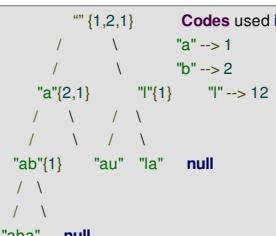
On first look it looks like a problem of permutation/combination. But on closer look you will figure out that this is an interesting tree problem.

The idea here is string can take at-most two paths:

1. Process single digit
2. Process two digits

That means we can use binary tree here. Processing with single digit will be left child and two digits will be right child. If value two digits is greater than 26 then our right child will be null as we don't have alphabet for greater than 26.

Let's understand with an example .Array a = {1,2,1}. Below diagram shows that how our tree grows.



Braces {} contain array still pending for processing. Note that with every level, our array size decreases. If you will see carefully, it is not hard to find that tree height is always n (array size)

How to print all strings (interpretations)? Output strings are leaf node of tree. i.e for {1,2,1}, output is {aba au la}.

We can conclude that there are mainly two steps to print all interpretations of given integer array.

**Step 1:** Create a binary tree with all possible interpretations in leaf nodes.

**Step 2:** Print all leaf nodes from the binary tree created in step 1.

Following is Java implementation of above algorithm.

```
// A Java program to print all interpretations of an integer array
import java.util.Arrays;

// A Binary Tree node
class Node {

    String dataString;
    Node left;
    Node right;

    Node(String dataString) {
        this.dataString = dataString;
        //Be default left and right child are null.
    }

    public String getDataString() {
        return dataString;
    }
}

public class arrayToAllInterpretations {

    // Method to create a binary tree which stores all interpretations
    // of arr[] in leaf nodes
    public static Node createTree(int data, String pString, int[] arr) {

        // Invalid input as alphabets maps from 1 to 26
        if (data > 26)
            return null;

        // Parent String + String for this node
        String dataToStr = pString + alphabet[data];

        Node root = new Node(dataToStr);

        // if arr.length is 0 means we are done
        if (arr.length != 0) {
            data = arr[0];

            // new array will be from index 1 to end as we are consuming
            // first index with this node
            int newArr[] = Arrays.copyOfRange(arr, 1, arr.length);

            // left child
            root.left = createTree(data, dataToStr, newArr);

            // right child will be null if size of array is 0 or 1
            if (arr.length > 1) {

                data = arr[0] * 10 + arr[1];

                // new array will be from index 2 to end as we
                // are consuming first two index with this node
                newArr = Arrays.copyOfRange(arr, 2, arr.length);

                root.right = createTree(data, dataToStr, newArr);
            }
        }
        return root;
    }

    // To print out leaf nodes
    public static void printleaf(Node root) {
        if (root == null)
            return;

        if (root.left == null && root.right == null)
            System.out.print(root.getDataString() + " ");

        printleaf(root.left);
        printleaf(root.right);
    }

    // The main function that prints all interpretations of array
    static void printAllInterpretations(int[] arr) {
```

```

// Step 1: Create Tree
Node root = createTree(0, "", arr);

// Step 2: Print Leaf nodes
printleaf(root);

System.out.println(); // Print new line
}

// For simplicity I am taking it as string array. Char Array will save space
private static final String[] alphabet = {"", "a", "b", "c", "d", "e",
    "f", "g", "h", "i", "j", "k", "l", "m", "n", "o", "p", "q", "r",
    "s", "t", "u", "v", "w", "x", "y", "z"};

// Driver method to test above methods
public static void main(String args[]) {

    // aacd(1,1,3,4) amd(1,13,4) kcd(11,3,4)
    // Note : 1,1,34 is not valid as we don't have values corresponding
    // to 34 in alphabet
    int[] arr = {1, 1, 3, 4};
    printAllInterpretations(arr);

    // aaa(1,1,1) ak(1,11) ka(11,1)
    int[] arr2 = {1, 1, 1};
    printAllInterpretations(arr2);

    // bf(2,6) z(26)
    int[] arr3 = {2, 6};
    printAllInterpretations(arr3);

    // ab(1,2), l(12)
    int[] arr4 = {1, 2};
    printAllInterpretations(arr4);

    // a(1,0) j(10)
    int[] arr5 = {1, 0};
    printAllInterpretations(arr5);

    // "" empty string output as array is empty
    int[] arr6 = {};
    printAllInterpretations(arr6);

    // abba abu ava lba lu
    int[] arr7 = {1, 2, 2, 1};
    printAllInterpretations(arr7);
}
}

```

Output:

```

aacd amd kcd
aaa ak ka
bf z
ab l
a j

abba abu ava lba lu

```

#### Exercise:

1. What is the time complexity of this solution? [Hint : size of tree + finding leaf nodes]
2. Can we store leaf nodes at the time of tree creation so that no need to run loop again for leaf node fetching?
3. How can we reduce extra space?

This article is compiled by Varun Jain. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

## GATE CS Corner Company Wise Coding Practice

Advanced Data Structure  
[Facebook](#)  
[number-digits](#)

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



Meet Prasoon, he was just your average guy who studied at IIIT-Hyderabad but today Prasoon Mishra is one of the most well known 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](#) 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: What's 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-pressure 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Facebook  
Google  
Interview Experience  
Walmart

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[[TopTalent.in](#)] Exclusive Interview with Ravi Kiran from BITS, Pilani who got placed in Google, Microsoft and Facebook



Even if we were to search around the world, it would be a truly difficult job to find someone like Ravi Kiran. As a Computer Science Graduate of BITS Pilani – Pilani Campus, he successfully bagged job offers from an astounding three companies – all being some of the best and most admired companies in the world – Google, Facebook and Microsoft. We, at [TopTalent.in](#), managed to talk to this amazingly humble genius, who hails from Hyderabad.

And before we forget, Ravi has also agreed to share his resume with our users so as to help them with their preparation. So don't forget to [grab a copy](#) by logging in. Here is the exclusive interview in its original form.

**Team TopTalent.in: What were the similarities and differences between Google, Microsoft and Facebook Interviews?**

**Ravi:** All three of them share the prestige of being some of the best tech companies in the world. As you would expect, their interviews are designed to ensure the recruitment of top talent. An obvious similarity amongst their interview processes (for undergraduates, at least) is them being vastly algorithmic in nature.

There are multiple interview rounds in each recruitment process. For Microsoft there were 4 while Facebook conducted 3. For Google, I was a previous intern and, hence, faced just 2 rounds. Another noticeable thing was the presence of design questions in one of the rounds by both Microsoft & Google. However, by no means, can this be a generalization to the interview process of any of the companies. At the end of the day, this only reflects how each of them is aiming to assess a candidate's potential to the greatest amount in the shortest period of time.

**Team TopTalent.in: How did you choose between Google, Facebook and Microsoft?**

**Ravi:** The more thought I put in the decision making process, the more confused I got. One of the major things I believed was that none of them was going to be a bad decision, so it was always safe to pick any one of them and not go wrong. Ultimately I chose Google, since I liked it as a company. I must confess that it was mostly a gut-feeling based decision.

**Team TopTalent.in: What is the kind of skill-set that companies like these, are looking for in candidates?**

**Ravi:** Even though I'll keep one of the companies in mind, that is Google, to answer the questions further on, I can safely say that this answer of mine applies vastly to the three of them. The skill-set sought out is that a candidate must be creative, so as to come up with smarter and newer solutions to problems, which are algorithmically very strong and don't waste time solving already solved ones. The candidates are supposed to be, obviously, good at programming so that they can give shape to their ideas in the form of real code.

**Team TopTalent.in: What should one keep in mind while creating a resume for these tech companies?**

**Ravi:** There are a lot of good references on "What makes a very good resume?" I had searched the same, and stuck to whatever made the most sense. I highly recommend a 1-page crisp resume, so that it's easier to make an impression when someone glances at it for about 3 seconds (I'm guessing that the time spent by a higher-up person on a single resume is nearly that)

In addition, it's very important to make the resume highlight qualities and projects that provide enough reason to believe why you would make the perfect candidate for the job. Prior programming experience and other achievements would be useful to mention, to further your chances of making a good impression.

**Team TopTalent.in: Your advice to all the students out there who're aspiring for job offers similar to yours?**

**Ravi:** I think it's important to enjoy the field of work, and apply to only the companies that align with one's interests. In the long run, it would be hard to work in case the work doesn't go with your interests, even if the company is as nice as those mentioned above. I had never aimed to get into any of these companies, and it has only been a consequence of the activities that I was actively interested in (like competition programming, random problem/puzzle solving, etc) and thoroughly enjoyed.

**Team TopTalent.in: What's the difference between the work allotted in the Indian Office and the US Office?**

**Ravi:** I will speak about this question with respect to Google, since I have an experience in both the offices. The work isn't really any different across the offices. If you have a good project idea, you're always welcome to begin on it, and take it forward irrespective of which office you are from. I myself have had the chance to intern with a very good team back in Bangalore. Work in MTV is going really great too. That being said, the US office has more diverse project choices to offer, merely owing to its larger size.

**Team TopTalent.in: How can freshers/pass outs apply to these tech giants off campus? What's the process involved?**

**Ravi:** Applying off campus is usually a simple process in these days. Most of the companies have websites for application process, wherein one can just submit his/her resume, and expect to be shortlisted. It is important to highlight the efforts of other companies that are providing interview opportunities, through performance in online programming contests.

HR personnel of almost all companies are on a constant lookout for talented programmers, and students performing well in the online programming contests have great potential. A good chunk of people also get an interview call through the employee referral route.

**Team TopTalent.in: And lastly, what are you working on at Google and how has the experience been so far?**

**Ravi:** I work in the Search Infrastructure team at Google, and the journey has been great so far. Google's a fun place to work for, and they ensure to provide one of the best work conditions possible for an employee. It is very surprising how they provide so many amenities – for having fun and indulging in non-work related activities and interests – but at the same time manage to provide some really challenging work.

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## Facebook Interview | Set 1

I am a final year student of IIT Guwahati and the first phase of placements has just finished at our college. I was recruited by Directi but not before three grueling rounds of interview. I was also shortlisted by Microsoft, Facebook and Goldman Sachs as well but got rejected after the first round of interview from all the three companies :(. I will be posting questions relating to all the companies I was interviewed by as well as some interview preparation advice (which should be particularly useful for students sitting for on-campus placements). Following are Facebook interview questions

---

### Online Coding round:

It boiled down to finding all possible simple paths (paths without cycles) between two vertices in a graph.

#### Round 1:

- 1) Given a string, check if it is a palindrome by ignoring spaces. E.g. race car would be a palindrome.
- 2) Given two very large strings, consisting of only digits, multiply the two strings and return the result as a string.

This article is compiled by **Vikram Goyal**. Many Many congratulations to Vikram for his selection in Directi. We will be soon publishing other interview experiences as separate posts. 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.

## GATE CS Corner Company Wise Coding Practice

## Flipkart Interview Experience | Set 41 (For SDE 1)

**Round 1: Machine Coding – 90 mins** (You need to code this on the interview site)(Any programming language)

Best Selling Price

You need to make a program in which

- 1.) You can add a product -> addProduct("p1")
- 2.) A user can purchase a product -> purchase("u1", "p1")
- 3.) A user can return a product -> returnProduct("u1", "p1")
- 4.) A user can be blacklisted and all of his purchases will be marked null -> blackListUser("u1")
- 5.) Display the best selling product -> bestSelling()

Best selling product will be the one which have been bought by most number of unique users.

Bonus: Display the best selling products for each category.

Evaluation: After you are done with your code, two Flipkart SDEs will run test cases on your code and evaluate it. They will also ask some questions around your code.

#### Round 2: Face to face interview – DS and Algo

The interviewer asked me to solve following problems:

- 1.) You have User's web access pattern in the form of URLs for a specific website. How will you determine whether the user actually backtracked to the home page from some webpage of the website.

So a user is currently accessing the website, hence we are receiving continuous stream of inputs from the user in the form urls

assume "1" is a url, "2" is a url and so on, the patterns can be:

1 2 3 4 5 4 3 2 1 4 5 6 7 .....

Assume 1 is the homepage, so the user backtracked to the home page 1 2 3 4 5 4 3 2 1

- 2.) You are given with the co-ordinates of warehouses of our delivery network. Some of these warehouses are near a River which is about to get flooded. Tell one approach through which we can quickly detect which warehouses may be affected by this flood so that we can secure them quickly.

#### Round 3: Hiring Manager Round

I was asked to introduce myself, what I like the most about my current job, what all are the projects I worked on and how, why e-commerce.

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## GATE CS Corner Company Wise Coding Practice

## Flipkart Interview Experience | Set 40 (For SDE 1)

I was interviewed for Software Development Engineering (SDE1) role Flipkart.

**Round 1: Machine Coding round: (90 minutes)**

Given a binary tree as a sequence of (parent, child) tuples: (A B)(A C)(B G)(C H)(E F)(B D)(C E) Write a program to find following errors in the tree:

- E1: More than 2 children
- E2: Duplicate Tuples
- E3: Cycle present
- E4: Multiple roots
- E5: Multiple parents

Input is a expression containing parent child relations. output is Error codes or success.

Sample test cases

- Input: (A B)(A C)(B G)(C H)(E F)(B D)(C E) Output: Success
- Input: (A B)(A C)(A D) Output: E1
- Input: (A B)(A B) Output: E2
- Input: (A B)(B C)(C A) Output: E3
- Input: (A B)(C D) Output: E4
- Input: (A B)(B C)(A C) Output: E5

### Solution

Code is written in node.js javascript. Tests are using mocha. Major trick in this question is that the data structure need to hold such data is not a binary tree but a graph. Or a graph with two sets of edges children and parents.

I used this DS in javascript to solve:

```
function Node(data) {  
    this.data = data;  
    this.children = [];  
    this.parents = [];  
}
```

Cycle detection can be done using <http://www.geeksforgeeks.org/detect-cycle-in-a-graph/>

My solution: <https://github.com/niklabh/tree-error-checker>

### Round 2: Face to Face

1. Design a load balancer which implements following methods:

- add(n) where n is id of instance
- remove(n) where n is id of instance
- getRandom() which returns a random instance.

All these operation should be of order O(1).

Solution: <http://stackoverflow.com/questions/5682218/data-structure-insert-remove-contains-get-random-element-all-at-o1>

Followup for this question was to change getRandom in such a way that it returns with weighted randomness rather than uniform randomness if weights is associated with instances.

Solution:<http://stackoverflow.com/questions/4463561/weighted-random-selection-from-array>

2. You are given a result of cricket tournament with all the wins and losses. Print the teams in such a way that a winning team is always at the right of losing team.

Solution: Store the results as a Directed Acyclic Graph and run topological sort algo.

<http://www.geeksforgeeks.org/topological-sorting/>

### Round 3: Face to Face

1. Explain your projects in detail
2. Key metrics about your project i.e. how much load it handled etc.
3. If you are storing same data in separate DBs how will you keeping them in sync.
4. If you are to write your project from scratch what will you change?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 39

Telephonic Round:

1. How do you code Producer-Consumer problem ?
2. There is a requirement in Flipkart to show minimum price in the last 30 days, which data structure should be used for this ?
3. One DP problem, There are 10 houses in a row. A thief can't pick money from the adjacent houses, how much maximum money he can make with this condition ?

Skype Round Question:

### The Firing List

There is down-turn in the ship-building industry. Ace Shipping Corp (ASC) wants to be prepared by having a system that will help evaluate the total cost saving they will

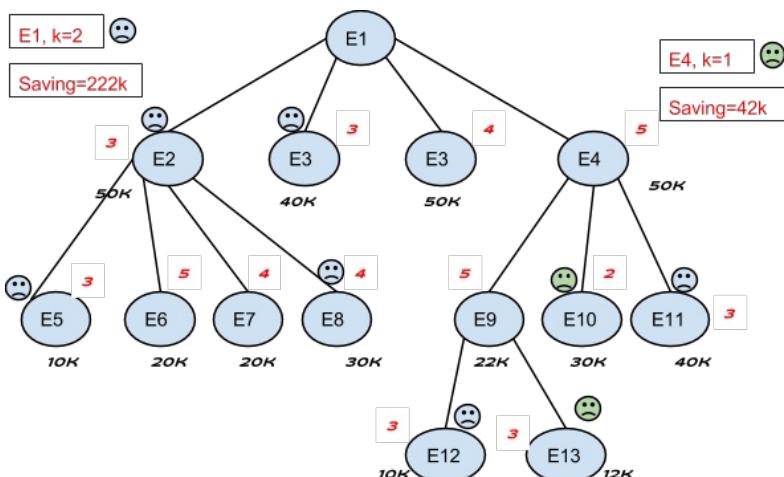
achieve if they were to 'let go' some employees.

Following are the rules for drawing up this Firing List:

1. Each manager at every level in the organization will have to contribute 'heads' from his team to the firing list
2. The input to the system would be a small integer  $k$  ( $=1, 2, \dots$ ) which would be the number of employees chosen per manager. The output would be the total cost saved for this  $k$ . Different values of  $k$  would give an idea of the total cost saving achieved.
3. The primary selection criteria is Performance Rating.  $k$  employees with the minimum rating under a given manager are to be selected.
4. If two employees have the same rating, the one with the higher salary gets selected (to maximize cost saved)
5. The activity might be requested for the sub-org under any manager. The default is to consider the entire org.
6. Although total number of reportees for a manager is usually of the order of 10, it could possibly be a much larger number in some org too. An optimal way of choosing the  $k$  reportees would be preferred.

The following information needs to get stored per Employee:

- Employee ID (unique)
- Name
- Performance Rating (1-5, 1 is lowest, 5 is highest)
- Salary (Rs)



Onsite Round 1 :

1. Code Bracket Validator.
2. Find the number of times a sorted array has been rotated.
3. Topological sort.

Hiring Manager Round :

1. Tell me about your project.
2. Some HR questions.
3. Tell me features you want to have in an online rental site.

An example org structure is given below with the cost saving achieved for (E1, k=2) and (E4, k=1) respectively

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview Experience| Set 38 (On-Campus for SDE)

I was interviewed on-campus for Software Development Engineering (SDE1) role Flipkart.

#### Coding round: (90 minutes)

Coding round was done on hackerrank .

1. Given two numbers  $a$  and  $b$ , find  $k$ th digit from right of  $a^b$ . (Naïve method will only help you to pass half of the test cases)
2. Second question was based on reducing a given expression in its smallest form and printing lexicographically smaller expression.
3. You are provided with  $n$  and  $m$  values which denote the rows and columns. Rajesh starts at top most cell  $(0, 0)$ . He will not visit the visited cell.
  1. He moves to the point towards his right
  2. If he cannot move one point to the right, he rotates right and then takes the path to the right
  3. If after performing 4 rotate operations, if he cannot move then he would stop

Print the number of cells visited by him.

Sample 1:

3 3

Output: 9

Explanation:

1 2 9

4 3 8

5 6 7

The problem can be solved using dynamic programming but there is also a logical way to solve it in less time.

#### Interview Round 1:

Duration: 1 hour

1. Given two arrays of length n and n-1, all elements of both the arrays are same except one. Find the odd element out, giving O (1) solution.
2. Given two binary trees (not any special tree like binary search tree or red black tree) with n and n-1 nodes respectively, find the odd node out.
3. Given two binary search trees with n and n-1 nodes respectively with all elements same except one, find the odd node.
4. Given an array where each element signifies the number of cells which can be skipped, find the minimum number of steps taken to reach the last cell of the array.  
One has to start at index 0 and always move forward either by skipping cells by number given or by one.

Tips:

Practice writing pseudo codes on paper and focus on reducing the time and space complexity.

#### Interview Round 2:

Duration: 1 hour

1. Given two words (beginWord and endWord), and a dictionary of words, find all shortest transformation sequence(s) from beginWord to endWord, such that:
  1. Only one letter can be changed at a time
  2. Each intermediate word must exist in the dictionary
2. Design a data structure such that it can be used to do the following operation

Insertion: O(1)

Deletion: O(1)

Search: O(1)

FindRand: O(1) this will return any element stored with each element having equal probability.

Hint: Random number generator of the system can be used.

#### Interview Round 3:

Duration: 1 hour

This was the final HR round where general questions were asked. Questions were asked from resume mainly focusing on projects you have done.

#### Round 4:

Duration: 10 minutes

Given 1 GB memory space write the pseudo code to print the maximum occurring string at any point of time where the size of the list of string can be of 10 GB and are updated dynamically.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience| Set 37 (On-Campus for SDE 1)

**coding round 1-(1 hr) – hackrank**

1. given a string of any length, check if first half of the string ( $n/2+1$  in case of odd length) is an anagram of the second half of the string or not.
2. in a 2d matrix, some cells are obstacles and others are clear. find number of paths from 0,0 to m,n.(0 paths if 0,0 is obstacle, wasn't specified but was the 6th test case).

**coding round 2— (45 min + 15 min extended later) – hackrank**

1. given n cities' populations. you have to divide k hospitals in these cities such that the population load for the hospital with maximum load is minimum eg 2 cities – 20000,50000 and k=6 . so hospital in 1st=2, in 2nd=4 and answer is 12,500, the maximum load on any hospital.

-add populations to priority queue, assume giving one hospital to each city in starting. pop from queue, give this city one more hospital, add (population)/(no. of hospitals in queue), do this till you have hospitals left, then return top of priority queue.

2. simple bfs question with surprisingly complex language.. couldn't figure out the question.. something about rods fused together being separated where cost of each separation is  $\sqrt{n}$ .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview Experience| Set 36 (On-Campus for SDE 1)

Recently Flipkart visited our campus for hiring interns as well as SDE..

#### Coding Round 1 (90 min) :

Q1(Simple brute force solves 12 testcases....O(n) using dequeue solves all 13 testcases)

<http://www.geeksforgeeks.org/maximum-of-all-subarrays-of-size-k/>

Q2(Simplest Greedy)

<http://www.geeksforgeeks.org/greedy-algorithms-set-1-activity-selection-problem/>

Q3(Dynamic Programming)

<http://www.careercup.com/question?id=5734224617275392>

#### Coding Round 2 ((25 min + 15 min extended)):

1 Question

There is a tree..we are given n denoting the number of nodes....and we are given (n-1) nodes pair between which edges exist....Now, a edge is like a light chain which can be turned on by switching on(i.e. selecting) any one of the nodes it belongs to(an edge will have 2 nodes :p).The edge will be on even if only one of the nodes is selected and even if both are selected but it will be off if neither of the 2 nodes are selected. Now, we need to find the minimum number of nodes that we need to select(i.e. turn on) so that all the edges are turned on.....

Sample input(n and then (n-1) pairs)

5  
1 2  
1 3  
2 4  
3 5  
3 6

Output(single integer)

2

Explanation:

Turning on the node number 3 and 2 will turn on the entire range of edges.

#### Interview Round 1(Time – 1:15-1:30)

Q1

Maximize XOR of 2 numbers....(best solution is using trie)

Q2

<http://www.careercup.com/question?id=5612093642375168>

Q3

A dictionary with many given words...given a string with random missing spaces, find all the valid possible correct outcomes of the string.

Solved using recursion...didn't complicate too much..

next he added that the dictionary also contains the count of the number of times it has previously occurred. I was asked based on that what parameter will i use to determine which of those possible outcomes of string is most likely?

Eg >

$d[] = \{ a=2 ; ab=4 ; c=3 ; bc=5 \}$  solve for string "abc"

Here 2 possibilities are

1. a...bc :: we have count for each "a" and "bc" as x=2 and y=5

OR

2. ab...c :: we have count for each "ab" and "c" as x=4 and y=3

Took a page out of my project, in FCM, we use dist formula between a point and cluster centers to decide the membership function of the point being a part of the cluster..In this case i used distance formula from center( $\sqrt{x^2 + y^2}$ ) as the value to decide the better possibility of the string..The farther from the center, the more likely it is....

#### Interview Round 2(Time – 30-45 min)

Q1

Just like in Q2 of Interview Round 1, there r n houses wid given heights in an array...We have a paint brush that paints any length and width in one stroke given that it is continuous and has no blank spaces in between...U r allowed only horizontal/vertical paint strokes...Find minimum number of strokes needed to paint all the buildings without causing any spill...

It was simple enough... create a func(f) find the minimum val of the array and then call func(min->right) and func(min->left) and add them and add 1 extra.. I gave this soln in less time and optimized O(n) soln and he seemed happy wid it...

Q2

<http://www.geeksforgeeks.org/given-a-string-find-its-first-non-repeating-character/>

I first gave a simple soln using a map pair but he asked me how would i store the map so that i wouldn't have to check which came first...So, i used a doubly linked list similar to the solution in the given link....

I did well in both these round and was called for the HR round eventually.

#### HR Round

It was one of the best interview i have ever had. Discussed about my projects, college life, internship , interests, strength, weakness and about what i consider a good life, a good job and how susceptible will i be to change in role within the company etc..

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview Experience| Set 35 (On-Campus for SDE 1)

Recently flipkart visited our campus for hiring interns as well as SDEs

Here is the interview process:

#### Round 1 : Online coding test on Hackerrank

2 questions were asked:

Duration 90 minutes

a. Given an array and an integer b, traverse the array and if the element in array is b , double b and continue traversal. In the end return value of b.

Eg: I/p 2,3,4,10,8,1 B=2

O/p: 16

Used ad-hoc approach . You just need to take care about the fact that ans can be long long.

b. Given k,n,m. where k is no. of coconuts you initially have. n is some no. such that if you have  $\geq n$  coconuts, you become stressed otherwise you are normal. m is the no. of shops. You go from 1st shop to m-th shop without skipping any shop. At i-th shop, either you buy  $S_i$  coconuts or sell  $S_i$  coconuts. If you are stressed then you must become normal at next shop. If you have less than  $S_i$  coconuts and you want to sell then you must sell all the coconuts you have. The task is to calculate maximum possible changes of your mood from stressed to normal or vice-versa.

Used recursion with memoization.

#### Round 2: Technical Round f2f Duration 45 min

2 questions:

a. Given a string reverse the sequence of vowels in each word of string

Ex: I/p I work for flipkart

O/p I work for flapkirt.

Fully functional code was expected along with time complexity.

b. Given co-ordinates of flipkart fulfillment center and n sellers find the nearest k sellers.

I first suggested sorting. Then he asked me to think of any other approach. Told him to use heaps. Discussed about its time complexity. He said complexity to build heap is  $n \log n$  but i stuck to my answer that it is  $n$ . He then told me he was just checking my confidence 😊

Interviewer was extremely polite and cordial.

I did well in these two rounds so I was not asked to give another technical round and was selected for direct interview with hiring manager.

Some of the round 2 questions were on topics like matrix dp, trees, linked list, etc.

#### Round 3: With hiring manager. Duration 1.5 hrs

One of the best conversations I have ever had. Discussed about my projects, college life, what i did at my internship , favorite subjects, worst subject, what is interesting about flipkart, role model, etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview Experience | Set 34 (On-Campus for SDE-1)

Flipkart recently visited my college for recruiting for SDE-1 profile. Here I am sharing my interview experience.

#### **First Round: 2 coding questions on HackerRank (90 minutes).**

- 1) Given a matrix of  $n \times n$ . Each cell contain 0, 1, -1.  
0 denotes there is no diamond but there is a path.  
1 denotes there is diamond at that location with a path  
-1 denotes that the path is blocked.

Now you have start from 0,0 and reach to last cell & then return back to 0,0 collecting maximum no of diamonds.  
While going to last cell you can move only right and down.  
While returning back you can move only left and up.

- 2) Given an array of integers you to find the range  $l, r$  such that and operation of largest two element in that range is maximum.

For example:

Input

6 1 6

Output

1 3

You have to print lexicographically smallest range.

After this round 23 students got shortlisted for interviews.

#### **Second Round: Around 45 minutes (Face-to-Face)**

He start with a ice breaker question. Tell me something about yourself??

Then he moves to some coding question

- 1) Given a 2D array, find the maximum sum subarray in it.  
<http://www.geeksforgeeks.org/dynamic-programming-set-27-max-sum-rectangle-in-a-2d-matrix/>
- 2) There is a stream of integer coming. At any given point of time you have to tell median of numbers.  
I give three solution to this problem using hashmap , sorting , and self balancing augmented binary tree.Finally he got satisfied ?
- 3) He ask me binary index tree (Fenwick tree). Each and every concept of Fenwick tree.
- 4) The stock price of each day is given. You have to find the maximum profit you can make by buying or selling this stocks. <http://www.geeksforgeeks.org/stock-buy-sell/>

#### **Third Round: Around 45 minutes (Face-to-Face)**

He ask me some questions on my projects. Then he asked me some coding questions.

- 1) Given a 2D array containing 0 & 1. 0 denotes water body & 1 denotes land you have to tell total no island.

<http://www.spoj.com/problems/COUNTISL/>

- 2) You can use bfs or dfs to solve this question. He ask me to write the full code for this problem.  
LRU implementation. Check my code on boundary conditions.

- 3) You have 100 documents each containing 100 words. You have to make disjoint set such that each set contains same document. By same documents he means document containing same words but can be in any order.

Firstly, I thought of trie. But he ask me to optimize my code. Then I use set and various different data structures to solve this question.

#### **Hiring Manager Round: Around 1 hour (Face-to-Face)**

He ask me some HR questions like your bad and good experiences in college.

Why should we hire you??

Why should we not hire you??

Then he ask me to explain polymorphism to my grandmother??

Then he ask me normalization in dbms , why do we need normalization??

What are the various normalization forms??Explain them??

What is primary key ,candidate key And super key??

Given a binary tree you have to print the outer boundary of tree??

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

## **Flipkart Interview Experience | Set 33 (For SDE-1)**

Flipkart has done a drive in Delhi.

#### **Round 1: Machine Coding**

You are given some equations which may contain  $>$  or  $=$  on different-different operand. For example there are valid input and invalid ( $a=5$ ,  $b<a=50$ )

```
String e1 = "a>b=1";
String e2 = "a>b=2";
String e3 = "a>c>e=3";
String e4 = "a>c>f=4";
String e5 = "b>a=5";
```

```
String e6 = "a>b>c=5";
String e7 = "b=7";
String e8 = "a>b>c>d=99";
String e9 = "a>b=99";
```

You need to create JSON string from it.

```
{
  'a': {
    'b': [1,2,99],
    'c': {
      'e':3,
      'f':4
    }
  },
  'b': {
    'a':5
  }
}
```

Highlighted one are invalid because they come they ask for overwrite the data (a>b>c = 5; C has e and f so we can overwrite).

Input: You are given those string in string array

Output:

Construct JSON

Print it

If you print in same as above (nice manner) +point

I solved this problem using Trie

One can see my implementation at here: <https://github.com/nitsgupta/practice/tree/master/JAVA/JsonBuilder>

## Round 2: Face To Face Algo DS

1. Do a level order traversal for a tree where order of printing is reversed on each level.

First i gave O(n<sup>2</sup>) solution they asked for less complexity solution. I then gave BFS solution by keeping a FIFO queue.

2. You are given a file of parent child relations. Data is huge consist of millions of lines.

```
parent child
a -> b
c -> d
e -> f
```

Provide a data structure to keep data in the memory.

Provide a solution to keep data in permanent storage.

3. You are given a 2\*2 matrix which contains cost of visiting each cell. You have to find lowest cost path from 0,0 to m,n where cost is minimum.

You can move only in down and right direction.

I gave a DP solution with complexity O(mn)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 32 (For SDE-1)

Flipkart recently visited my college for recruiting SDE-1. Here I am sharing my interview experience.

### First Round: 2 coding questions on HackerRank (90 minutes).

1. Given some data about computer systems (like RAM, ROM, processor speed, battery, etc). You need to print the top-k computers based on (i) RAM (ii) If RAM is same then ROM (iii) If ROM is same then processor speed, etc.

Constraints: k <= 100

(No. of computer systems) n <= 1000000

**Solution:** Any O(nlogn) sorting would work. But what I did was implement Bubble Sort and ran k-passes of it. Then printed the last k-elements of the array. It took O(nk) time which was okay since k <= 100.

2. There is a maze of size n\*n. Tom is sitting at (0,0). Jerry is sitting in another cell (the position of Jerry is input). Then there are k pieces of cheese placed in k different cells (k <= 10). Some cells are blocked while some are not. Tom can move to 4 cells at any point of time (left, right, up, down one position). Tom has to collect all the pieces of cheese and then reach to Jerry's cell. You need to print the minimum no. of steps required to do so.

**Solution:** Dynamic Programming.

### Second Round: Around 1 hour (Face-to-Face)

1. Given a variation of singly linked list, where every node can have 2 pointers: next and down. You need to flatten the list into a singly linked list in which every node has only a next pointer. This needs to be done in-place, so the down pointer of every node should be set to null.

Example:

```
1 -> 2 -> 3 -> 4
|   |
V   V
7 -> 8  10 -> 11
|
V
14 -> 15 -> 16
|
V
20 -> 21
Output:
1 -> 7 -> 14 -> 15 -> 20 -> 21 -> 16 -> 8 -> 2 -> 3 -> 10 -> 11 -> 4
```

**Solution:** I first told him to do it iteratively using stack. He said that its too complex. I then told him to use recursion, which was about 2 lines of code. He asked me to code it and was completely satisfied. Remember to cover all the base cases and the corner cases.

## 2.1. You are given a string. Print the first non-repeating character.

Solution: I asked him the character encoding. He said ASCII. I told him to take an integer array "count" of size 128 with every element set to 0. Scan the string and for every character 'c', do `count[(int)c]++`. Then scan the string again and when you find the first character for which `count[(int)c] == 1`, print it and break out. If no such character found whose `count[(int)c] == 1`, that means no answer (no non-repeating character in the string).

## 2.2. What if the string is very long. Doing two passes is expensive.

**Solution:** I would use an array of structure with two elements count and index. When we do `count[(int)c]++`, we will also set `index[(int)c] = index of c in the string`. Now instead of scanning the string second time, scan the structure array (for  $i = 0$  to 127) and keep a temporary variable, `tempIndex = MAX_INTEGER`. When you find `count[i] == 1`, check if `index[i] < tempIndex`. If true, update `tempIndex` to `index[i]`. In the end print the character in the string at `index = tempIndex`. If `tempIndex == MAX_INTEGER`, that means no answer (no non-repeating character in the string).

## 2.3. You are not given a string. You are given some queries of Type 1 and Type 2.

Type 1: Append character (given as input) to the end of the string. The string is initially empty.

Type 2: Print the first non-repeating character in the string that is formed so far.

**Solution:** Keep on constructing the string for every Type 1 query. That would take  $O(n)$  time for every Type 1 query on a non-mutable string. If we use a mutable data type, like `StringBuilder` in case of Java, it would take  $O(1)$  time for every Type 1 query.

For Type 2 query, run the algorithm of 2.2 (above). That would take  $O(n)$  time for every Type 2 query. If there are  $q$  Type 2 queries, it will take  $O(nq)$  time.

## 2.4. Solve 2.3 (above) in constant time, i.e. for every query (of Type 1 or Type 2) take constant time. So overall complexity should be $O(q)$ where $q$ = no. of Type 1 queries + no. of Type 2 queries.

**Solution:** Took a lot of time (around 20 minutes), and tried a lot of stuff before arriving at the below solution.

- Construct a queue using a doubly linked list (singly linked list can also be used with some modification in the below algorithm, but the interviewer said not to bother).
- Construct a hashMap with Key = character, and two values. Value 1: boolean `isPresentInQueue`, Value 2: Pointer to a node in linked list.
- When you receive a character (in Type 1 Query), check if that character is present in hashMap.
  - If not present, insert it. Set `isPresentInQueue` to true. Insert the character to the end of the queue and keep the pointer (address) of the inserted node in the Value 2 part of the hashMap (for that particular character). This will take  $O(1)$  time.
  - If the character is present in hashMap and `isPresentInQueue` is set to true for that character, set `isPresentInQueue` to false. Using the pointer (address) in the Value 2 part of the hashMap (for that particular character), delete the node from the linked list. This will take  $O(1)$  time.
  - If the character is present in hashMap and `isPresentInQueue` is false, ignore the character and move forward. This will take  $O(1)$  time.
- When you receive a Type 2 Query, just print the front (head) of the linked list. That would be the answer. This will take  $O(1)$  time.

Every query (of both Type 1 and Type 2) is taking constant time. So, overall complexity is  $O(q)$  or  $O(\text{no. of queries})$ .

## 3. Explain external merge sorting. And try to optimize it if possible.

**Solution:** I said I don't know what external merge sorting is. But I know what merge sorting is, and I know that external sorting is basically sorting some data that is present in the secondary memory (because it is too big and can not be brought entirely into the main memory). So, he said now combine the two. I gave a couple of algorithms, the first one was a naive approach in which I would divide the entire data into  $k$  pieces, bring each piece into memory, sort it, push back to secondary memory and so on. Then I told something similar to Tournament Trees.

## 4. Explain the best, average and worst case complexities of all the sorting algorithms that I know. In which scenarios do they work the best.

**Solution:** I told him about 8 algorithms, their best, average and worst case complexities, and the scenarios in which they are useful (for all of them). Believe me, every one of them is useful in some case or the other. For example, bubble sort is one of the best algorithm to solve the coding question asked in the first round.

## 5. Questions about my projects.

## 6. Questions about an event (algorithmic coding contest) that I organized in my college's tech-fest.

## Third Round: By a senior hiring manager (through Skype). Around 1 hour.

1. Questions about my projects.
2. Questions about an event (algorithmic coding contest) that I organized in my college's tech-fest.
3. My favorite website. I told quora. He asked me how does quora deliver the information so quickly. I told him I don't know exactly what they do. But can tell what I would do if I need to deliver the information so quickly. I then gave a very abstract idea in which I made use of distributed systems, caching (based on particular users and their interests), etc.
4. Some more discussion about general (but technical) topics. He told me about his work and team. Asked about my interests and aspirations.

**5. Puzzle:** You are blindfolded (you can't see). There are 100 coins lying on a table. 80 are tails-up and 20 are heads-up. You need to divide them into two groups of x and y each ( $x+y = 100$ ). You can pick any coin and flip it (if its tails, it will become head and if its head, it will become tail), but you can't see so you don't know which coin you are flipping. In the end, the two groups should contain equal number of heads.

Solution: It took almost 15-20 minutes for me to figure it out. Divide into group 1: 20 and group 2: 80. Flip all the 20 coins of group 1.

Thanks a lot to GeeksForGeeks.

#### General Advice:

- They will ask to write syntactically correct code for all your solutions. So, don't give a very complex solution (unless necessary).
- They will ask time and space complexity of all your solutions. Properly analyze the solutions before telling the complexity. In case of recursive solutions, write recurrence relations.
- Don't just think in your mind. Think out loud. Tell them everything that is going in your mind.
- If you know a problem beforehand, tell them that you have seen it earlier. They are interested in knowing how would you solve a new problem and that is your best opportunity to show your thought process. If you don't tell them that you know the solution and fool around, they will figure out and it will be bad for you. Believe me, they will surely figure out that you knew the solution beforehand.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 31 (For Fresher)

### PROCESS

Test→ Test→ Technical Interview→ Technical Interview.

### OWN EXPERIENCE

TEST [ Duration: 90 mins | Questions: 2 ] (ROUND 1)

2 coding questions on Hackerrank platform

#### Experience

1) A Diamond is present on the nth step. A Boy wants to get it. He can jump either j steps or 1 step at a time. In how many steps will he get the Diamond(Very Easy)

2) This question can be solved either by DP or memoization. (Hard)

```
int one=0, zero=0;
void reco(int n)
{
    if (n<=0) zero++;
    if (n==1) one++;
    else
    {
        reco(n-1);
        reco(n-2);
        reco(n-3);
    }
}
```

Given above program you have to print the value of one and zero.

\*\* you can solve it directly by recursion but try doing that for 100 (<https://www.codechef.com/problems/SUMTRIAN>)

if u have trouble solving the codechef problem then try editorial or search online how to solve it.

### Tips

The programs asked in this round are not lengthy, but takes a lot of time to think, after that debugging is another issue.

So, choose your language wisely and learn its Standard library

C++ programmers learn how to use STL

Java also has standard library check it out.

practice easy level in hackerrank for few days and later shift to medium and hard

TEST [ Duration: 20+10 mins | Questions: 1 ] (ROUND 2)

1 coding questions on Hackerrank platform

#### Experience

You are provided with n and m values which denote the rows and columns

Rajesh starts from top most node(0,0)

1-He moves towards the point towards his right.

2-if he cannot move one point to the right, he rotates right and then takes the path to the right

3-if after performing 4 rotate operations , if he cannot move then he would stop.

print the number of nodes reached by him

//The above question is written in own words

sample 1:

3 3

output : 9

explanation:

rajesh faces -> direction first

the traversal is

1 2 9

4 3 8

5 6 7

Tips

If u look at the problem and test case u feel like it involves a lot of graphs. But you are provided with only 20 minutes, I cant solve it by approaching the problem that way.

So, I tried few own test cases and the logic is very simple

Don't look at the problem only one way. Trust your instincts

### **TECHNICAL INTERVIEW (ROUND 3)**

1-Given an array, how do you get the count of pairs that sum to even

2-Given an array, how do you get the count of pairs that sum to odd

3-You are getting requests for room allotment, each request will have the start time and end time of the request. Print the minimum number of room required to support all requests

Experience

For Question 1 and 2, I gave a solution that is of  $O(N^2)$  and  $O(N)$ .

Try solving it yourself. (just have to explain on paper and they might ask u to write the sample code on paper)

Third question: This problem I felt it tough.

I explained to the interviewer but the implementation of that is very tough.

Finally, He suggested me to use the sorting technique after the meeting is done.

Complexities of the system will be asked for your code

### **TECHNICAL INTERVIEW (ROUND 4)**

1-minValue in stack in  $O(1)$

2-Queue implementation using stacks

Experience

This is basically a DS round.

I explained the interviewer both the questions nicely with time and space complexities.

Tips

geeksforgeeks.org

previous experiences of others

All the best

### **KEY SKILLS TESTED**

Mostly Logical Questions

### **TIPS TO BUILD YOUR SKILLS**

Don't try to type the very moment you read the question, try to solve it on paper first.

Make your own testcases

### **BLOGS/ARTICLES**

Notes | HackerEarth

<http://https://www.codechef.com/wiki/recursion-sums-triangle> (Read this only after trying the problem)

### **VIDEOS TO WATCH**

DS and sorting are best explained by Robert Sedgewick in Java (coursera)

### **WEBSITE TO REFER**

<https://www.geeksforgeeks.org>

### **GENERAL TIPS/ADVICE**

Don't tell the complexities without analyzing the problem correctly.

Learn the Syntax of the language perfectly( we should not focus on the syntax when we are working on problem with time constraints)

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### Minimum steps to reach a destination

Given a number line from  $-\infty$  to  $+\infty$ . You start at 0 and can go either to the left or to the right. The condition is that in  $i$ 'th move, you take  $i$  steps.

- Find if you can reach a given number  $x$
- Find the most optimal way to reach a given number  $x$ , if we can indeed reach it. For example, 3 can be reached in 2 steps, (0, 1) (1, 3) and 4 can be reached in 3 steps (0, -1), (-1, 1) (1, 4).

Source: [Flipkart Interview Question](#)

**We strongly recommend you to minimize your browser and try this yourself first.**

The important think to note is we can reach any destination as it is always possible to make a move of length 1. At any step  $i$ , we can move forward  $i$ , then backward  $i+1$ .

Below is a recursive solution suggested by Arpit Thapar [here](#).

1) Since distance of +5 and -5 from 0 is same, hence we find answer for absolute value of destination.

2) We use a recursive function which takes as arguments:

- Source Vertex
- Value of last step taken
- Destination

3) If at any point source vertex = destination; return number of steps.

4) Otherwise we can go in both of the possible directions. Take the minimum of steps in both cases.

From any vertex we can go to :

(current source + last step +1) and

(current source – last step -1)

5) If at any point, absolute value of our position exceeds the absolute value of our destination then it is intuitive that the shortest path is not possible from here. Hence we make the value of steps INT\_MAX, so that when  $i$  take the minimum of both possibilities, this one gets eliminated.

If we don't use this last step, the program enters into an INFINITE recursion and gives RUN TIME ERROR.

Below is C++ implementation of above idea. Note that the solution only counts steps.

```
// C++ program to count number of steps to reach a point
#include<bits/stdc++.h>
using namespace std;

// Function to count number of steps required to reach a
// destination.
// source -> source vertex
// step -> value of last step taken
// dest -> destination vertex
int steps(int source, int step, int dest)
{
    // base cases
    if (abs(source) > (dest)) return INT_MAX;
    if (source == dest) return step;

    // at each point we can go either way

    // if we go on positive side
    int pos = steps(source+step+1, step+1, dest);

    // if we go on negative side
    int neg = steps(source-step-1, step+1, dest);

    // minimum of both cases
    return min(pos, neg);
}

// Driver Program
int main()
{
    int dest = 11;
    cout << "No. of steps required to reach "
        << dest << " is " << steps(0, 0, dest);
    return 0;
}
```

Output:

No. of steps required to reach 11 is 5

Thanks to Arpit Thapar for providing above algorithm and implementation.

This article is contributed by Abhay. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.

### Flipkart Interview Experience | Set 30 (For SDE 2)

Machine Coding Round: (1 hour)

Implement a finite state machine.

- The machine should have one start state and can have multiple end states
- It should be extensible (I should be able to add any number of states or transitions at any time)
- I should be able to set notifications on or off for any state or for the whole state machine

Design: (1 hour)

Implement Bidding system in Flipkart's website

Algos: (1.5 hours)

1) There is one meeting room in Flipkart. There are n meetings in the form of (s(i),f(i)) where s(i) is start time of meeting i and f(i) is finish time of meeting i

What is the maximum number of meetings that can be accommodated in the meeting room ?

2) Given a number line from -infinity to +infinity. You start at 0 and can go either to the left or to the right. The condition is that in i-th move, you take i steps.

- a) Find if you can reach a given number x
- b) Find the most optimal way to reach a given number x, if we can indeed reach it

3) Given a string s1 and another string s2, what is the smallest substring in s1 that contains all the characters of s2 ? (most efficient solution)

4) Given a string s1 from a dictionary and a string s2 from a dictionary, find the minimum number of steps to transform s1 to s2 under the following conditions:

- You can change the implementation of dictionary
- Every transformation should belong to the dictionary
- You are given a O(1) library function F(s1,s2) which returns True or False for the query 'can s2 be obtained from s1 with a single transformation'

Hiring Manager Round: (1 hour)

Lots of questions on projects, implementation, design etc.

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### GATE CS Corner Company Wise Coding Practice

### Flipkart Interview Experience | Set 29

#### Round 1: Machine Coding

Q. In a regular expression, \* represents 0 or more repetitions for preceding character. & represents the regex preceding it is at the end of string. and all small case letters represent themselves. For example:

rat&

Pass: bigrat, smallrat

Fail: ratoulite rats

a\*b

Pass: b, ab, aab

Fail: a, asd

abc

Pass: abc, abcd zabcd

Fail: abdc, dabfc

Write a code for it.

#### Round 2: discussion and test case analysis of code

Another question:

What if . represents 1 character, how will you handle it. Handle .\* in a regex.

Thorough analysis of the code with his internal test cases.

#### Round 3: Face to face

1. test case on the code I wrote.
2. If any element is occurring n/2 times in a n sized array, how will you find it.

Method 1: sort it, pick n/2 element and traverse array once to make sure that the middle element is present greater than n/2 times.

Method 2: Use Map, pseudo code:

```
if (map.find(i) == map.end())
```

```
map.push(i, 1);
else
map.find(i)->second++;
```

traverse map once to know the required element.

3. Copy a random linked list. [Geeks for geeks link](#).

4. Find width of a tree. [Geeks For Geeks link](#).

with geeks for geeks it may seem easy but a thorough analysis is needed. Including pseudo-code. I did the thing after adding an extra variable in node DS.

#### Round 4: Senior Manager Round

1. Why flipkart
2. Job description, very specific about current role
3. Reader-writer problem code, without semaphore. I used two variables, asked me to minimize variable usage.
4. Given a text file, store all the words using a tree. I gave a trie solution.
5. What is the most challenging project you have done in your lifetime and why.

PS: If thorough knowledge about approaches are not prepared then its better to get screwed. They will ask every case possible.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 28 (For SDE2)

**Round1:** Machine coding and discussion based on that.

Was asked to design and code snake and ladder game. Then questions where asked on how it can be extended.

**Round 2:** puzzles and data structures

Question 1: you are given a 1d array. The values represent the height of wall from floor. We are supposed to find what will be the amount of water it can hold. For ex.. Array(1,0,3) can hold 1 unit of water. Array(3,1,3) can hold 2 units of water. I did not give correct solution here. Can anyone suggest me the correct solution here...

Question 2: We have a huge log file for meeting times in an office. Each entry has only start and end time. Given this we have to find the time which has the most number of meetings. He basically expected me to sort it and find the conflicting entries.

I was rejected in this round. But all interviewers were down to earth. It was a nice experience. All the best for others.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 27 (For SDE)

**Telephonic Round:** It was an exploratory discussion with the hiring manager. More about the current work and behavioral questions.

**Machine Coding Round:** Design and build tic tac toe game. The code should be up and running. It should be scalable to multi-users and nXn grid.

**Discussion of Machine Coding Round:**

Follow up questions on various modifications like introduction of not-allowed block in the tic tac toe grid, different winning criteria for different users and so on.

**Algorithms and DS Round:**

- 1.Given a large string a and a smaller string b . Find the minimum size window in the string a which contains all the characters of the string b.
2. Some question on job scheduling which I can't remember.

**Design Round:**

Design a cricket series. Extend it to olympics.

**Hiring Manager:** In depth explanation of current work and behavioural questions.

Thanks to GFG!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

# Flipkart Interview Experience | Set 26

## 1. Machine Coding:

Two players, two field; and have multiple ships located in their fields. They are guessing each others ship position and hitting. Tell who wins first. Design maintainable code which can incorporate future change.

2. Discussion on Design of previous code. A lot of new use cases to handle. Explain your design. How will you deal with new changes in problem statements.

3. i) Tell about yourself, expectation from flipkart

ii) Maximum overlapping problem

iii) clone linkedlist with arbitrary pointer

4. Hiring Manager: tell me about yourself, why flipkart, why change etc. You know c++ only but here you need to work in java how will you deal. etc...

Got rejection after a week. Thanks to geeks anyways.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

# Flipkart Interview Experience | Set 25

Hello, I recently attended an interview at Flipkart. There were four rounds:

## Round 1:

I was given a problem statement and I had to write a fully functional working code at my laptop. I was told that the focus is not on logic but on the way I code and the design of my solution. The problem statement was something like : "There is a n player game of cards. The deck of card is not fair, i.e. any card can be there any number of times. A card has a number and a color. Each player gets k card each (n and k can be hardcoded in the solution). The computer starts the game by throwing a card from the deck of cards. Assume the card is 4 of Green. Then the other player has to throw either a 4 of any color or Green of any number. If the player does not have any such card, then it can say pass. The player who finishes all his card wins. The logic of selecting the card by the user can be hardcoded (Eg, If you use a list data structure for storing the cards for a player, then you can say that the player always throws the first card from the list). The logic was required only to start and conclude the game.

I was given close to 1 hour to finish this. First we had a discussion about the design of my solution and then I was asked to code. After I was done coding, she checked my code, asked a few questions about how will I add some new features in the game.

After the first round, I was told they'll send the lunch to me. They sent Dominoes pizza for lunch ☺

## Round 2: Designing Round

I was asked to design a snake and ladder game. The game can have more obstacles than just snake and ladders. There were a lot of questions asked about the design.

## Round 3 : Problem solving

This round was about testing the problem solving and data structures. A few questions were asked about my current project. Then I was given a problem for which I had to decide the data structure to be used and the algorithm. The problem was : "Assume you have a starting 4 digit number, say 1234 and an ending 4 digit number 4567. For changing a bit of a number from 1 to 3 (for example), it will take 2 steps (from 1->2 and from 2->3). So to convert 1234 to 4567, you'll have to change each and every bit individually in some number of steps. (Change 1->4 in 3 steps, 2->5 in 3 steps and so on). Now there is a list of blacklisted numbers. So while transforming start to end, if you reach a blacklisted number, then you cannot change that particular bit, you'll have to move to another bit. E.g. Assume 1434 is a blacklisted number, and while transforming you reach it, then you have to change either 1, or 3 or the last 4. So you have to find the least number of steps in which start number can be transformed to end number.

## Round 4 : Hiring Manager Round

A lot of questions were asked about my current company. I was asked to draw the architecture of my project and my company (basic overview). Then they asked quite a lot of questions about my current project, some difficulties I faced there. If I had to change some requirement in my current project, what it would be. Also, they asked me why I want to work for Flipkart.

I was also given a problem to solve (I don't remember it now). Then they asked me if I get to meet a celebrity and ask him a question, who will it be. I was asked to take my time to answer this question.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

# Flipkart Interview Experience | Set 24

## Round 1

1) There are M chocolate packets each packet can have variable number of chocolates in each packet. There are N students ( $N < M$ ). Distribute chocolate packets to student such that

a) each student gets 1 packet

b) suppose  $m_1, m_2, \dots, m_n$  are the packets which are chosen to be distributed in sorted order of number of chocolates in them ( $m_n - m_1$  must be minimum)

$M = 1, 3, 4, 6$  (4 packets with specified number of chocolates in them)

N = 2  
Ans = 3,4

- 2) Given unsorted array and a number K. Find 2 numbers such that sum is K.  
3) Given n-ary tree. zigzag level order traversal.  
4) Given daily stock rates of last year give the average stock rate price for a given day range

In-person interviews

- 1) Code library management system  
a) add a book  
b) issue a book  
c) return a book  
d) if a user has kept a book more than 10 days then there should be a fine of Rs. 1 per day post 10 days.
- 2) Design snakes and ladders game (multiplayer). extend it so that it can be hosted over a server and played over a server

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview Experience | Set 23

I recently had flipkart interview on-site, Bangalore. This interview has 4 rounds. Three technical and one manager.

#### Round 1: Machine coding: 1 hour 30 min

Very nice question

Questions: You are given some equations which may contain > or = on different-different operand. For example there are valid input and invalid (a=5, b<a=50)

```
String e1 = "a>b=1";
String e2 = "a>b=2";
String e3 = "a>c>e=3";
String e4 = "a>c>f=4";
String e5 = "b>a=5";
String e6 = "a>b>c=5";
String e7 = "b=7";
String e8 = "a>b>c>d=99";
String e9 = "a>b=99";
```

You need to create JSON string from it.

```
{
  'a': {
    'b': [1,2,99],
    'c': {
      'e':3,
      'f':4
    }
  },
  'b': {
    'a': 5
  }
}
```

Highlighted ones are invalid because they ask for overwrite the data (a>b>c = 5; C has e and f so we can overwrite).

Input: You are given those strings in string array

Output:

1. Construct JSON
2. Print it
3. If you print in same as above (nice manner) + point

I solved this problem using Trie 😊

One can see my implementation at here: <https://github.com/nitsgupta/practice/tree/master/JAVA/JsonBuilder>

#### Round 2: Discussion and optimization: 30 min

This round is all about discussion on your previous implementation, why did you use? How did you come up with approach, any further optimization? Etc. Interview was impressed with my data structure selection and implementation (though I mentioned him I've assumed few things and that can be generalized via different way)

#### Round 3: DS Algo : 30 min

\*You are given a binary tree with extra pointer : next . Populate it

<http://www.geeksforgeeks.org/connect-nodes-at-same-level/>

\*Calculate width of binary tree mathematically, what is the maximum width of any tree could have of n nodes.

— I came up with  $2^{\log n}$

\*Design a data structure with perform following operation in O(1) time

->Enqueue , ->Dequeue , ->Find and ->delete

My Approach1: I answered using hash table(item,boolean) and queue

Then he asked me tell me when ur code will break. [Since he did not mention the item could be repeated so Boolean is not right choice]. I answered instead of Boolean I'll have count. After that I said in that case delete will be not be O(1).

My Approach 2: Queue as doubly linked list, Hashmap (integer, doubly linked list of pointer to node of queue]

\*Basic fundamental questions.

\*Probability question: You are given with PxQ matrix and a point inside the matrix (x,y) where you standing. If you step outside the matrix you'll die. You are allowed to move in all four direction. Movement will be totally random. For Given N steps, what is the probability that you'll alive?

My approach: I tried different approaches from bad to good approach. My last approach based on small problem to big problem i.e. Induction based. But I was not able to bring up to the equation what he was expecting.

<http://stackoverflow.com/questions/16522296/probability-of-death-of-a-man-moving-n-steps-in-a-matrix>

#### **Round 4: Manager round: 2 hour**

\* Various behavioral questions

\*Discussion on Last project

\* What problem have you faced in last project, how did you resolved them

\* Tell me the architecture design of your last project.

\* What was the most critical?

\* Various question on Concurrency

\* Various question based on my resume [I had taken interviews in IITR from my last company]

etc...

I would like to say thanks to GeeksforGeeks for such a wonderful platform for tech guys.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

## **Flipkart Interview Experience | Set 22 (For SDE 2)**

#### **Telephonic Round – 1:**

1) Inversion count in an array – <http://www.geeksforgeeks.org/counting-inversions/>

2) Iterative pre order traversal.

#### **Telephonic Round – 2:**

1) Given an array and a number x, check for pair in array with sum as x – <http://www.geeksforgeeks.org/write-a-c-program-that-given-a-set-a-of-n-numbers-and-another-number-x-determines-whether-or-not-there-exist-two-elements-in-s-whose-sum-is-exactly-x/>

2) Some question similar to reversing a linked list

I was called to Bengaluru for In house interviews after two telephonic rounds

#### **Coding Round:**

1) Word Break Problem – <http://www.geeksforgeeks.org/dynamic-programming-set-32-word-break-problem/>

#### **DS and Algo Round:**

1) Possible words from phone keypad – <http://www.geeksforgeeks.org/find-possible-words-phone-digits/>

#### **Design Round:**

1) Design delivery system from city Hub to the customer – There was focus on how to figure out the location of the customer from address, finding the shortest path etc.,

2) Design a state machine – Each state can handle n events and based on the event type next state is determined

#### **Hiring Manager Round:**

This was mostly based on the work I do and some behavioral questions

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

## **Flipkart Interview Experience | Set 21**

I was interviewed at Flipkart. Following was my interview experience.

Initially there was one telephonic screening round. then I was called at their bangalore office.

#### **Telephonic round:**

Given an unsorted array find an entry in array where arr[i]= i; modified it to if array is sorted.  
find median of a long stream of numbers at any instant of time.  
implement LRU cache. (DS used in it and explanation )

#### **Round 1. Machine coding round**

Maintain an employee hierarchy with attributes  
Print complete hierarchy of given employee.  
find top 10 employees on the basis of salary ,at any instant of time .  
Perform CRUD opérations on the hierarchy.

they measure you performance on following  
Code should be running  
time limit is 1:30 minutes.  
Appropriate data structures used.  
optimized and modular code.

#### **Round 2: Technical**

Optimize the code done in machine coding round  
A lot of discussion on the approach i used. Various edge case discussions.

#### **Round 3. Technical**

print the top view and right view if tree.  
create a mirror tree from the already existing tree inplace.  
How many ways a 4\*n wall be filled with 4\*1 sheets so that the wall ends uniformly.

#### **Round 4: Hiring Manager Round**

A lot of discussions on my previous work. asked me to draw the architectural diagram of my latest project and explain thoroughly.  
What is a columnar database. why we preferred redshift over mysql for data warehouse.  
Why Flipkart.  
what is your passion and aspiration  
Where do you see yourself down the line in 2-3 years.  
what kind of work motivates you.  
what was the toughest project you ever received. problems faced in that. how you solved it.  
Any questions if I had for him.

Basically Hiring manager wants to check if you are a good asset to his team and will fit in the company culture.

Thanks a lot to GeeksForGeeks for such an awesome platform for geeks like us ☺

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

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## **Flipkart Interview Experience | Set 20 (For SDE-II)**

I was recently interviewed for SDE-II in Flipkart. A lot of emphasis was on designing and geeksforgeeks has been a lot of help. These are my interview questions:

#### **Round 1 : Machine Round (2-3 hours)**

Company hierarchy/bonus question.  
Write down code in any language for a simple employee hierarchy which has 3 types of employees.  
1. CEO  
2. Manager  
3. employee  
Where an employee can have only 1 mgr, and a mgr has 1+ employees.

We were asked to input employee details(name ,id, salary,rating etc) in any order (employees might be input before his manager), create the hierarchy and implement these functionality:  
1. Print hierarchy given any employee/mgr/ceo (used an n-ary tree + hash table)  
2. Given a bonus and performance rating of each employee divide it to the lowest level employees(in the hierarchy ) in the ratio of their rating. i.e 100 divided among 2:3 is 40 and 60. and print the bonus of each ( simple recursive solution)  
3. Top 10 employees with ratio of bonus:salary (used maxheap)

Had a discussion on the solution with various variants and edge/faulty cases.

#### **Round 2 : Problem Solving Round (1.5 hours)**

1. A solution was required to make a fantasy league with some budget allocated. Players will have some score/rating and the cost of player. Maximum score was to be achieved with eleven players.  
Had a lot of discussion on various approaches like backtracking, modified knapsack etc.  
2. A set of tasks is given of which some are dependent tasks. Solution was required to enable parallel processing of the tasks. (Used topological sort)

#### **Round 3 : Designing Round (1 – 1.5 hours)**

A library for game 2048 was to be designed. The game can have constraints/variations which shall be defined by the game designer. The variations can be adding same numbers or adding Fibonacci numbers etc. APIs were to be exposed to the game designer.

#### **Round 4 : Manager Round (45mins)**

A lot of behavioral questions. Discussion about the product and the work I do. Challenges faced etc.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

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### **Flipkart Interview Experience | Set 19 (For SDET)**

#### **Telephonic 1:-**

- 1) Given string s and string t find whether all permutation of t is present as substring in s.
- 2) Find kth node from last in single linked list

#### **F2F 1:-**

Deep discussion about automation framework and project.

#### **F2F 2:-**

Discussion about testing framework  
Find middle of linked list  
Find last cell visited in 2D matrix traversed in Spiral Fashion  
Find if one table is replica of other table in SQL  
Discussion about Cookies,access code,HTTP status code

#### **F2F 3:-**

Discussion about project.  
How will test a feature assuming you cant have production data in QA.  
What are shorting of above.

#### **F2F 4:-**

Given a login page come up with all possible test case from login API point of view and UI point of view.

Given two string find whether two are anagram of each other or not. Write clean and runnable java code with covering all possible test cases.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

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### **Flipkart Interview Experience | Set 18 (For SDE I)**

I have recently attended Flipkart for SDE 1 @ Bangalore. Thanks to geeksforgeeks team which has been the only single source of my preparation and helped me a lot. Below is my experience.

#### **Machine Coding Round:**

- 1) Design a book catalog search (api's were given for the search,full needs to be implemented as running application)

#### **Second Round:**

- 1) Discussion on the design and optimization of the application
- 2) Basic DS questions (Eg:which ds to be stored to increase search efficiency ...Ans:B+ tree)

#### **Data Structures and Problem Solving Round:**

- 1) Given two unsorted arrays A and B in which B can accommodate in A

How will you merge the two arrays.

Time complexity and space complexity were also given importance .

- 2) Perimeter of the binary tree in clockwise direction(All kind of possible approaches and efficient approach were discussed)

Time complexity and space complexity were also discussed.

Second DS Round Skipped

#### Hiring Manage Round:

##### 1) Problem Statement

Sid is obsessed about reading short stories. Being a CS student, he is doing some interesting frequency analysis with the books. He chooses strings S1 and S2 in such a way  $|len(S1)|+|len(S2)| \leq 1$ .

Your task is to help him find the minimum number of characters of the first string he needs to change to enable him to make it an anagram of the second string.

##### Input Format

The first line will contain an integer T representing the number of test cases. Each test case will contain a string having length  $|S1|+|S2|$  which will be concatenation of both the strings described above in the problem. The given string will contain only characters from a to z.

##### Output Format

An integer corresponding to each test case is printed in a different line i.e., the number of changes required for each test case. Print -1 if it is not possible.

##### Constraints

$1 \leq T \leq 100$

$1 \leq |S1|+|S2| \leq 104$

##### Sample Input

5

aaabbb

ab

abc

mnop

xyyx

##### Sample Output

3

1

-1

2

0

##### Explanation

Test Case #00: We have to replace at least three characters from any of the string to make both of strings anagram. Here, a = "aaa" and b = "bbb". One possible solution is to replace all character 'a' in string a with character 'b'.

Test Case #01: Either replace 'a' with 'b', which will generate "bb". Or replace 'b' with 'a' to generate "aa". Both of the solution are valid.

Test Case #02: It is not possible for two strings of unequal length to be anagram for each other.

Test Case #03: We have to replace both the characters of any string to make it anagram of other one.

2) Five Years from now

3) Expectations from Flipkart?

4) Hobbies and weekend plans and location related questions

5) Any questions for me?

Keep up the good work guys.

All the best for other geeks

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview Experience | Set 17 (For SDE II)

I was interviewed for SDE – II position @ Flipkart. Below is my experience.

### Round 1 : Telephonic Round (around 90 minutes)

He started with his and mine introduction, the products I have worked on, the challenges I have faced during its development ( basic questions). Then he asked me 2 questions.

1. Find the LCA (least common ancestor of 2 nodes) in a Binary Tree  
node structure -> data, left child, right child, parent.
2. Design a data structure which would allow you to perform the following 2 operations supported in O(1) complexity.
  - a. Insert an element.
  - b. Return a random number from the numbers inserted so far. A random function is given which generates a random number.
  - c. Delete(int num) finds and delete a number from the ones inserted so far.

### Round 2 : Machine Coding round. ( 90 – 120 minutes)

Design the snake and ladder problem.

Full working code was required. They gave us more than 2 hours to complete.

Discussion on the code written and how i have implemented.

#### **Round 3 : Problem Solving Round ( 45 – 60 minutes)**

1. Level order Traversal of a Binary Tree.

2. You are given a string of 0's and 1's you have to find the number of substrings in the string which starts and end with a 1.

eg : input : 0010110010

output : 6

3. You are given a mapping like a -> 1, b-> 2... z-> 26.

You have to print all possible combinations of a given number using the above information.

eg : input : 121

output : aba,la,au

4. String Compression Algorithm.

You have to compress a string in the following format.

eg : input : aasasatb

output : 2a2sa1t1b

#### **Round 4 : Hiring Manager (40 minutes)**

General talk around what they do and what they expect from an engineer.

Gave me a puzzle : <http://www.mathsisfun.com/puzzles/planes-around-the-world-solution.html>

I would like to thank GeeksForGeeks for helping me in the preperation, i dont know the result so far but am very content with my overall experience during the interview.

Thanks and best of luck to all other geeks.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Flipkart

## **Flipkart Interview | Set 16**

### **1st round ( machine coding round)**

Write down code in any language for a simple employee hierarchy which has 3 types of employees.

1. CEO

2. Manager

3. employee

where an employee can have only 1 mgr, and a mgr has 1+ employees.

We were asked to input employee details(name ,id, salary,rating etc) in any order (employees might be input before his manager), create the hierarchy and implement these functionality:

1. Print hierarchy given any employee/mgr/ceo (used an n-ary tree + hash table)

2. Given a bonus and performance rating of each employee divide it to the lowest level employees(in the hierarchy ) in the ratio of their rating. i.e 100 divided among 2:3 is 40 and 60. and print the bonus of each ( simple recursive solution)

3. Top 10 employees with ratio of bonus:salary (used maxheap)

Write working code, modular, extensible, corner case handling etc. was arnd 1.5 – 2 hrs

### **2nd round**

discussion on your solution of the 1st round, how can you optimize it, then review of the written code

### **3rd round**

Ds and algo

1. snakes and ladders problem

2. median in a stream of integers

3. string searching (KMP / suffix tree was needed : not code just the logic)

4. Given any language , you use libraries , which might use more lib etc . Find the order of building the libraries (Topological sort)

5. Given a server with a stack with some initial state say 1 Users can modify the stack using regular ops eg push 2 , pop etc and each op causes a version change. i.e version 1 : 1 , version 2 : 2,1 , version 3 : 3,2,1 , version 4 : 2,

You have to design it s.t person can ask for any version of the stack (keep copies every k times and keep the ops in an nonvolatile memory)

### **4th round**

Design a new kind of an online poker game

give all entities and relationships in depth

further in depth discussion of how to make it more HA friendly, how to

handle players crashing etc

### **5th round**

HM round

in depth discussion of projects and general questions eg when you disagreed with your mgr etc

Process was crisp and took place from 10am – 5 pm on a weekend in Bangalore

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### [TopTalent.in] Interview With Amit Who Got Into Flipkart



Nobody could enjoy that moment more than him. He could barely put his feelings in words in achieving that feat. Such was his joy in getting into the biggest Online store in India, Flipkart. For a guy who is very passionate about coding could not end up in a better company than this. In his own words, 'I felt as if I was at the top of this world'. We at [TopTalent.in](#) got a chance to interact with Amit from NIT Kurukshetra about what made this possible and what others can learn from this.

In case you are wondering how the resume of a Flipkart recruit looks like, you can [download](#) the resume by logging in.

**TopTalent:** What job offers did you have apart from Flipkart?

Placement policy of our college doesn't allow one to sit for the recruitment process of any other company on campus once you get a job in a dream company which Flipkart definitely is. So, currently I don't have any other offer.

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

No words can help me crystallize the feeling that this job offer brought to me. I felt as if I was at the top of this world. My efforts finally paid off and Yes, the feeling is simply unforgettable.

**TopTalent:** What is the profile offered to you in Flipkart and Why did you choose this opportunity over others?

Profile offered is SDE1 (Software Development Engineer). It wasn't difficult for me to choose this because to me, coding is the passion first, habit next and profession last. Flipkart was looking only for this.

**TopTalent:** Can you give us a brief account of the whole interview process?

First round was online coding round in which we were supposed to solve 2 coding questions. Second round was machine coding round. In second round we had to design and code one coding question. 50 minutes of time was given for coding which was followed by small interview where interviewer expected the explanation of code. Third round was technical interview which continued for around 40 minutes. In it problems related to data structures and algorithms were discussed. Final round was hiring manager round. It started with some general talk (seemed like some HR interview at the point) but then interviewer shifted to technical aspects and asked some question from tree data structure. After around 30 minutes, this round concluded with interviewer asking me whether I had any query about working in flipkart.

**TopTalent:** What resources did you refer?

For coding practice:

1. Codechef.com
2. Spoj.com

For studying the data structure and algorithms:

1. Introduction to Algorithms, Thomas H. Cormen
2. Karumanchi
3. Geekforgeeks.org

For Interview process:

1. Careercup.com
2. Cracking the coding interview, Gayle L. McDowell.

**TopTalent:** What's your advice to students who are aspiring for similar kind of achievement?

Three things are needed to crack technical interview of any software company. Knowledge, Practice and Approach. In my third and fourth round of interview, what I felt was, that both the interviewers were more concerned about my approach than knowledge.

Incase you forgot, you can [download](#) the resume by logging in.

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## GATE CS Corner Company Wise Coding Practice

## Flipkart Interview Experience | Set 15B

Flipkart recently visited our campus for written test for December placements.

Hosted on : cocubes.com

Time : 90 mins

No objective questions.

Two coding questions only. We have to complete the function only.

### **Ques:**

Given a mxn grid, each of its element be either '.', 'R', 'G' or 'B',

where '.' -> empty, 'R' -> Red, 'G' -> Green, 'B' -> Blue

A Blue strip has width 1 and length greater or equal to one.

A Red strip has length 1 and width greater or equal to one.

If a Red strip and a Blue strip overlaps, the overlapped portion will become 'G'.

Find the minimum number of strips required to cover the whole grid.

Explanation:

Blue strips are vertical.

Red strips are horizontal.

Ex 1:

Only 1 vertical strip from (0,2) to (1,2). [Indexing from (0,0)]

Ex 2:

1 vertical strip from (0,2) to (2,2)

1 horizontal strip from (1,2) to (1,4)

1 horizontal strip from (3,0) to (3,0)

1 horizontal strip from (4,0) to (4,0)

so total — 4

Ex 3:

1 vertical strip from (0,2) to (2,2)

1 horizontal strip from (1,2) to (1,4)

1 vertical strip from (3,0) to (4,0)

1 horizontal strip from (4,4) to (4,4)

1 vertical strip from (4,4) to (4,4)

so total — 5

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## GATE CS Corner Company Wise Coding Practice

## Flipkart Interview | Set 15 (For SDE-II)

### **1st round (machine coding)**

You are given a catalog of books, which have following attributes.

Name

Author

Publisher

Publish year

Category

Price

Count (sold)

Implement following APIs on top of this catalog

addBookToCatalog(Book)

searchBook(by partial book name/author)

getMostSoldBooks(by author name/category, limit)

Expectations:

Maintain DB on memory

Code should be readable. Design, handle naming convention, handle exceptions & should be running

### **2nd round (code evaluation & discussion)**

1) Discussion on design (interfaces & extension)

2) Discussion on data structures (trie)

3) Discussion on sorting

### **3rd round (problem solving)**

1) Head -> a -> b .. -> Tail

Every node has a random pointer, pointing to a random node or null.  
You are given a dice (completely biased – you decide which one you want)

What is the minimum number of dice tosses required to reach Tail from Head?

**Hint:** Problem can be boiled down to snake&ladder problem, where forward pointer is a ladder & backward pointer is a snake.

2) N people are there.

knows(A,B) return true if A knows B, else false.

Celebrity: A is called a celebrity

If A knows none

Everyone knows A

Get celebrity, with less number of knows() method usage.

3) Dictionary of words is given

i.e. ["cat", "dog", "rat", "catratdog", "catter"]

Compound word: A word, which can be split into more than 1 valid words

get compound word, with longest string length.

#### 4th round (Design)

Design notification system (notify the customer with a message)

Client (delivery boy, company updates etc)

Services (Email, SMS, WhatsApp)

Scaling up, fault tolerance & failure management

Flexible modifiability of clients & services

#### 5th round(Senior Manager)

1) His info & organization profile

2) My intro

3) Exciting tasks that did at job? – Discussion technically

4) Strengths & weaknesses

5) Feedback to the manager, how an ideal manager should be?

6) Why flipkart?

#### 6th round (HR – casual)

1) How is the day, how are the interviews?

2) Any offers?

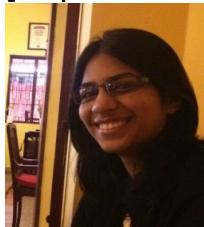
3) Compensation expected?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### [TopTalent.in] Exclusive Interview with Arushi Who Got Into Flipkart



It's not easy getting into one of the hottest companies in India. As company is growing at a crazy pace, Flipkart always looks for best talent out there to keep up with their growth. Arushi could crack it and in her own words, ' When I got placed at Flipkart it was hard to believe. Took almost a day to sink in'. We at TopTalent.in spoke to Arushi from BITS-Goa about her Flipkart experience and what are her suggestions for aspirants looking to achieve something similar.

**TopTalent:** What job offers did you have apart from Flipkart?

Apart from Flipkart.com I had an offer from Housing.com – A mumbai based start up.

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

When I got placed at housing it was hard to believe. Took almost a day to sink in. Getting placed at Flipkart was a similar experience. Felt good that I had offers from 2 such awesome companies.

**TopTalent:** Why did you choose this opportunity over others?

Choosing Flipkart was but natural having worked there for a year as an intern. Also Flipkart is neither a fully fledged multinational nor a start up any more. This presents a perfect learning opportunity

**TopTalent:** How was the whole internship experience with Flipkart?

I actually had two internships with Flipkart, for 6 months each. I was pretty raw when I first came. But all the people were pretty patient and their main aim was to teach me. Getting the work completed actually was at a lower priority. The second internship was better. It was a very open ended and fuzzy problem which involved quite new technology. I was given complete freedom to explore solutions and solve the given problem in the best possible way. It was a very different experience and

definitely helped me grow a lot. All the engineers, no matter how busy will always have time to listen and give suggestions regarding any technical problem you go to them with.

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

I think apart from the technical knowledge being a fast learner and persistence is important. Also a very important thing seen in Flipkart is the sense of ownership everyone has. No matter what designation a person is at.

**TopTalent:** What's your advice to students who are aspiring for similar kind of achievement?

The usual technical knowledge and knack for problem solving. The interview at Housing was pretty straightforward. It was mostly based on the work done in Flipkart. And a few puzzle solving.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview | Set 14 (For SDET-1)

The **first online round** was an online test from HackerEarth. It had 3 programming questions, out of which we had to program any two. The questions were:

- 1) To reverse the words in a given string
- 2) I don't remember this question properly but was something similar to this.... Finding all the factors of a given number and finding if the one's position of the factorial and the number were same..

There were 30 other MCQs from aptitude, programming, data structures and algorithms.

After the online test, there were 3 rounds

The **first PI round** was taken by a team member and he asked many questions regarding my final year project. He was also asking different flows and testing involved in them.

He asked me some SQL queries too. He also asked me a question like if you are given a sorted array of size 7 but only 4 elements in it and a sorted array of 3 elements. How would to combine the elements into the first array in such a way that array is sorted.

One more question which i remember— How do you find if a string is a palindrome or not?

They rejected few candidates in the first interview.

In The **second PI**, I was given two scenarios to write test cases(apart from UI testing). One was the flipkart coupon textbox from checkout page and the other was the gmail application. He also asked me sql query to remove all duplicates from a table having multiple duplicates.

The **third PI round** was taken by team leader. Question

- 1) Program to find the angle between the hands of a clock. Input- the time. Expected output- Angle in degrees
- 2) How do you find if given two linked lists intersect or not
- 3) Explain basic concept of JOINS in sql
- 4) If in a given table, consisting of student name and grade, Output a table containing each grade and its frequency in descending order.

That's all for now. If i can remember more questions, then I will definitely write to you.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview | Set 13

Hi, I was interviewed at Flipkart few days back. I was contacted by one of their head hunters. The process was as follows :

- 2 – Telephonic interview
- 1 – Machine Coding Round
- 1 – Problem Solving Round
- 1 – Hiring Manager Round

Last 3 rounds were at their office.

**Telephonic-1 :**

He asked about my previous projects in detail and then asked one problem.

Find the next smallest palindrome give a number. He asked me to write the complete working code.

**Telephonic-2 :**

Started straight away with the problems.

1. Find the median of a stream of integers. I knew the solution and discussed the heap solution for it.

- Given an array of integers, find a triplet having sum equal to K.
- Given an array a1, a2, a3 .... ,an, b1, b2, b3, .....bn. Rearrange this array to a1, b1, a2, b2, ....an.bn. This needs to be done inplace.

#### Onsite Rounds (f2f)

##### Machine Coding Round :

This was the most exciting round. Problem was to do 3 operations on very large numbers.

- Addition
- Subtraction
- Multiplication

Input can be positive or negative. In this round, focus was on Design and Coding Skills.

I was given 1 hr 30 mins to code for the problem. I completed in around 1hr 15 mins. Then he asked me extend my code for decimal numbers as well. I told him the approach. Then he asked me how will i do the division as well.

##### Problem Solving Round –

In this round he started with the discussion of Machine round problem. Then he asked me a simple problem. Find the first occurrence of a digit(1-9) other than zero in a stream of integers in less than o(n). Given i can't have the access to the memory location where stream is written.

He basically wanted to know how i think and how many approaches i can think of, and whether i can challenge him or not that its not possible. and yes i did.

Then he asked a stock span problem. Given stock prices in an array. Find the buying and selling time so that profit earned is maximum.

##### Hiring Manager round –

He asked me some behavioral questions.

Why do you want to join Flipkart. Then What would you do if something goes wrong on production, and you are unable to find the bug, etc.

Them he discussed the projects i had done in my previous company.

I would like to thank GeeksforGeek team for building such an awesome site and platform for interview preparation and helping out the geeks over there to grab good opportunities in the industry.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview | Set 12 (On-Campus)

I recently got selected in flipkart during an on campus placement drive. These were the questions faced by me.

### ONLINE CODING ROUND(2 QUESTIONS)

1- Given two sets of elements we have to find whether the resulting set of LCM of the two sets would be equal or not.

Ex:- Let the set be X = {2,3,4}

Then the LCM set would be consisting of all the LCM of any subset of the given set.

In this case, LCM(X)={2,3,4,6,12}

Constraints:

Number of elements in both sets donot exceed 50.

Range of elements i.e A\_i and B\_i Capacity of the road.

Now given n we have to minimize the overall cost of all unsafe roads.

Pretty tough from what I recall I understood that we have to calculated the maximum number of disjoint shortest paths so as to minimize the answer.(My solution only passed one test case).

### Round 1(F-2-F)

I was asked variety of questions ranging from strings to dp to graphs.

1- Given a corrupted string i.e it's original string with just the spaces at wrong places, Construct the original string .We are given a dictionary of words.

**Ex:-**

**string : Com** put erengineering  
**original string: Computer Engineering**

I gave the interviewer a recursive solution. The I was asked to code it. After that I was asked whether I could optimize the code further. I could not.

2- Given a lane where there are various houses each containing a fixed amount of gold. Now a robber has to rob the houses such that when he robs a house the adjacent one cannot be robbed.Calculate the maximum amount of gold collected by him.(Classic Dp question).

3- Given 1000 elephant ,none of whom exact heights are known, there are statements given which will be of two forms

3.i-E\_i is taller than E\_j  
OR  
3.ii-E\_i is smaller than E\_j

Calculate the ascending order of the elephants(in terms of height).

Seemed tough to me on the first look but after a few minutes I was able to do it.

(Construct a DAG using the statements and then topologically sort them to get the answer)

4- Topologically sort the DAG(excluding forest arrangement) given if the source is not known.

For Ex: if edges are 1->2,1->3,2->4,3->4 .

then normally we would run dfs from each pt and then choose the node as source which visits all the nodes.

This fairly is an O(n^2) algo.

I was then asked whether an O(n) algorithm is available.

I told the interviewer that if we run dfs from each node but instead of flushing clean the visited array each time we just keep the data then the dfs from the node after which whole visited array is marked i.e all the nodes are visited is the source.

when running dfs from a node if at any pt a visited node is encountered we leave the node and move to next child.Just by keeping a stack also during the dfs ....after all the values int the visited array is marked we will have the final topological sorted order of the DAG in the stack.

5- Given a pond where all the stones are lined at a distance of one unit (C in each row and there are R such rows), each stone has a special value which denotes the length of the jump the frog can make i.e if frog is on stone (x,y) and value is k then frog can jump to (x+dx,y+dy) where  $dx+dy=k$  and frog doesn't leave the bounds.Find the min number of jumps to reach the stone at (R,C).

Visualized it in form of a matrix.Did it using DP .....In case you are wondering, for a frog at cel (x,y) run two loops of dx and dy where net  $dx+dy=k$  and do  $dp[x+dx][y+dy]=\min(dp[x][y]+1, dp[x+dx][y+dy])$ .

Answer would be in  $dp[R][C]$ .

Then I was asked to backtrack the path which was quite easy as for  $dp[x][y]$  subtract 1 from it and look for the resulting value in cells (i,j) where i

ROUND 2(F-2-F)

Technical + HR

1- Implement LRU and LFU page replacement policy using Data structures.

Had already encountered the question while preparing for Amazon.

I did it using Doubly Ended queue and a hashmap(Map or BST does not matter as both have same complexity for retrieval and insertion of data).

2- Given a normal die and a blank die. Fill in the blank die such that probability of sum of the number from both die is same for all the resulting sum and sum has a range from 1 to 12.

After a hit and trial I realized the number on blank die would be repeated to given a even probability distribution.

Min element required on blank die = 0

Max element required on blank die = 6.

mark 3 sides with 0 and three with 6 .

Due to the fact that the probability of occurrence of 0 and 6 on the blank die is same and equal to 0.5 ,

$P(\text{Each sum})=1/2 \cdot P(i)=1/12$  for each number.

Now taking 1/12 in the start then deriving the solution should have been easy but due to the tiring day and worse weather my mind took the backdoor method.

Some HR related questions to minor projects done in the college and questions related to my experience with flipkart as a customer.

#### ROUND 3(BONUS ROUND)

Four of us who got selected after the second round were called in for a GD round where they told us that they desired to take only two of us.

We were baffled by the claim.

They told us that they wanted a group discussion on the topic WHY SHOULD FLIPKART HIRE YOU??

We went on for 10 minutes trying to butter them with advantages of flipkart and God knows what.

Then we were given our results on a chit.

After opening the chit we realized that it was just a prank.

WTF!!Welcome to flipkart

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview | Set 11

Checking your coding capabilities and thinking level is their main motive. Hence the whole procedure I was involved in dealt only with coding questions. ☺

There were total 4 Rounds.

1. Online Coding
2. Machine Coding
3. Face to face Technical Interview
4. Technical + HR

#### Round 1 : Online Coding :

Time: 1 hour 30 Min

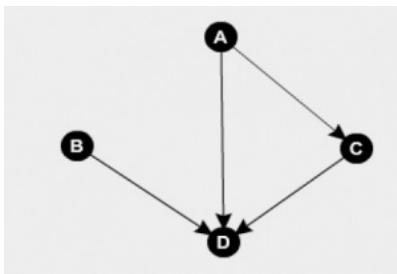
#### Question 1: Powers of 5

[http://community.topcoder.com/stat?c=problem\\_statement&pm=12155&rd=15177&rm=314191&cr=22639266](http://community.topcoder.com/stat?c=problem_statement&pm=12155&rd=15177&rm=314191&cr=22639266)

Same question with modified language.

#### Question 2: Application of DFS/BFS

You were given a directed graph with n nodes. Given graph was connected. If there is an edge from u to v then u depends on v. Our task was to find out the sum of dependencies for every node.



Example:

For the graph in diagram, A dependencies: C,D i.e. 2

B dependencies: D i.e. 1

C dependencies: D i.e. 1

And D depends on none.

Hence answer=0+1+1+2=4.

## Round 2: Machine Coding Round

Time: 1 hour 30 min

### Question:

Given two very large numbers a & b in string format. You need to produce the result for the following operation:

0 : Add a & b

1: Subtract a & b

2: Multiply a & b

Example:

123456789

987654321

Output:

0 ==> 1111111110

1 ==> -864197532

2 ==> 1219326313718945259

Few cases were checked specifically:

1) Output of 132-132 must be 0 not 000.

2) 2 – 122222000000 should produce -122222000000 i.e either a or b can be the bigger string.

3) Negative input should be handled. Result of -2+202 = 200.

4) 1000000000 – 1 = 999999999 i.e. resulting answer can be of different length.

## Round 3: Face to face technical Interview

Time: 45-50 minutes.

**Question 1:** Given the mobile numeric keypad. You can only press buttons that are up, left, right or down to the current button. You are not allowed to press bottom row corner buttons (i.e. \* and #).



Given a N find out the number of numbers possible of given length. It was asked to write the code.

Example:

For N=2

Possible numbers: 00,08 11,12,14 22,21,23,25 and so on. We have to print the count of such numbers.

I solved it using DP in first attempt. He was quite impressed as I took very less time to think of the exact solution.

**Question 2:** Given a undirected graph with following special points:

1) Every node has at most 3 links.

2) Node with a single link is a leaf node.

3) Nodes are numbered from 1 to N.

(Think how is it different from a 3-ary Tree, See bold text ⊕ )

We do the following operation on the given graph: Among all the current leaf nodes we search for the node with minimum node value, delete it and print its parent. We do this operation until only two nodes are left in the graph.

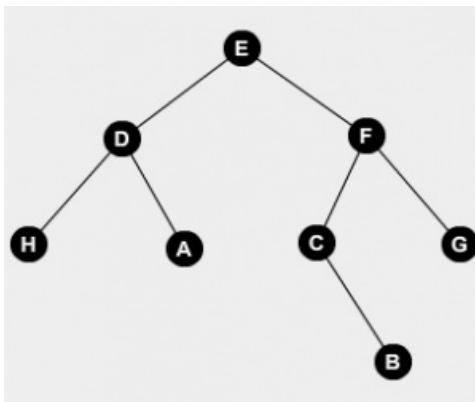
If you are given N and an array having the printed values from the operation, you have to generate the graph back. Exact implementation was asked to write.

Example:

N = 8

ar[] = {4,3,6,6,5,4}

Output should be adjacency matrix for the following graph.



Example Image for Question 2 of Round 3.

#### Round 4 : Technical + HR

Time : 1 Hour

- 1) Introduction.
- 2) Asked everything about my project every minute detail, even I was asked to write code for few sections of my code i.e. how I implemented those features.
- 3) Asked few questions on teamwork that how would I handle particular situations.
- 4) Strengths and weaknesses.
- 5) Tell me about one thing that you have done in college and proud of be it in academics or in any field.
- 6) Best and worst classmate till now and Why !! 😊

With this as the final interview my long journey of Interviews ended . Wish you all, all the very best hope this would help

Following are screenshots of round 1 online coding questions.

#### Summing Nodes (Programming)

At Flipkart, an employee has many subordinates. But an employee can also have many managers. And a manager can further have more managers overseeing his work.

A simple "boss-employee-relationship" can be denoted by an arrow ' $\rightarrow$ '.

$A \rightarrow B \rightarrow C$

This denotes that A is direct boss of B, who is direct boss of C. Here A is also (indirect) boss of C. It is guaranteed that there is no cycles in this relationship.

That is there exists no pair of employees, X and Y, such that X is boss of Y and Y is also boss of X.

The salary of an employee can be calculated on the basis of following rules:

1. an employee like C who has no subordinates earns 1.

2. An employee who has direct subordinates earns a salary equal to the sum of his direct subordinates' salaries.

"relations" denotes an array of strings, where if the  $j^{th}$  character of  $i^{th}$  string is 'Y', if employee  $i$  is a direct boss of employee  $j$ . Otherwise it is 'N'. You have to display the sum of salaries of all employees.

Complete this function in the code editor:

`int Summing(String[] relations)`

##### Constraints

- The size of `relations` array will not have elements greater than 50.
- the arrays will only contain string composed of 'Y' & 'N'.
- each element of the array has same number of characters.
- For  $k^{th}$  row, the  $k^{th}$  element will always be 'N'.
- If X is boss of Y, Y cannot be a boss of X.
- Test cases are designed such that answers will always lie within the range of signed 32bit int.

"The future is not always what we expect it to be. 60 years ago, we never thought that the world of humans, as we know it, will undergo such a drastic change. In the final war between the humans and the apes, the apes won, and Ceaser lead his civilization to its zenith," a fellow human prisoner tells another.

"Now some of them have even learnt mathematics and are trying their best to re-create human machines from ruins. They have asked me to help them start a power generator, or else they'll have no reason to keep me alive."

To start it, a puzzle has to be solved:

You have to complete a function `int optimalCuts(string s)`, where  $s$  is a string containing 0's and 1's. It has to return smallest positive integer  $C$ , such that, the bit string can be cut into  $C$  pieces and each piece is a power of 5. Note that each piece can also represent different power of 5. If no such cut is possible then return -1.

##### Constraints

- Argument (`String s`) will consists of only '0' and '1'.
- $1 \leq \text{length}(s) \leq 50$ .

##### Sample Case #1

`s = 10110101`

Returns: 3

Explanation: We can split the given string into three "101"s, where 101 is the binary representation of 5.

##### Sample Case #2

`s = 111101`

Returns: 1

Explanation: "111101" is 125 which is  $5^3$ .

##### Sample Case #3

`s = 00000`

Returns: -1

Explanation: 0 is not a power of 5.

##### Sample Case #1

Input

N

Returns: 1

Explanation: There is only one employee, so his salary will be 1.

##### Sample Case #2

Input

NNYN

NNYN

NNNN

NYYN

Returns: 5

Explanation: It has the following relation.



So salary of 3rd employee is 1, 1st and 2nd employee is equal to the sum of its (only) employee (3rd) which is 1. Salary of 4th employee is sum of salary of 2nd and 3rd employee which is  $1 + 1 = 2$ . So total salary is  $2 + 1 + 1 = 5$ .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

### Flipkart Interview | Set 10 (On-Campus For SDE-1)

#### Round 1(Online):

There were 2 questions time limit 90 mins.

1. A person wants to go from origin to a particular location, he can move in only 4 directions(i.e East, West, North, South) but his friend gave him a long route, help a person to find minimum Moves so that he can reach to the destination.

Input – NESNWES

Output – E

You need to print the lexicographically sorted string. Assume the string will have only 'E' 'N' 'S' 'W' characters.

E.g – SSNEEEW

output – EESS

2. A sender will send a binary string to a receiver meanwhile he encrypt the digits. You are given a encrypted form of string. Now, the receiver needs to decode the string, and while decoding there were 2 approaches.

First, receiver will start with first character as 0;  $S[0] = 0$ ,  $P[1] = S[1] + S[0]$ ,  $P[2] = S[2] + S[1] + S[0]$  and so on.

Second, Receiver will start with first character as 1;  $S[0] = 1$ ,  $P[1] = S[1] + S[0]$ ,  $P[2] = S[2] + S[1] + S[0]$  and so on.

You need to print both the strings, after evaluation from both first and second technique. If any string will contain other than binary numbers you need to print NONE.

#### Round 2(Machine Coding Round):

There was only one question, time limit 45mins

Q1. Word Wrap problem with few conditions, even i didnt remember much conditions here are some conditions.

- i) there can be maximum of X characters in a single line.
- ii) there can be maximum of Y number of spaces in the end of the each single line.
- iii) if a string length is big enough, so that it cannot be printed in single line, use '-' in the end of the line and print string further in the different line.  
also there should not be '-' consecutively in the end, if the string contains already '-' in the end dont put '-' character.

E.g. flip-kart and if x = 5 so it should be ->

flip-  
kart

iv) the string should not start with these characters(' ', ',', ''')

v) the cost value should be minimum, there can not be multiple answer for a single string.

Eg. This is a flipkart online programming test.

x = 10 Y = 3

Output

This is a  
flipkart  
online pr-  
ogramming  
test.

#### First Technical Interview (F2F):

They asked me about myself, so i gave my brief intro to them(there were 2 people who were taking the interview)

He saw my resume and asked me that do i know DBMS.

I said i have done a course on it. So he started asking about DBMS. He explained me how the order are made in flipkart (like there are many item from different locations and many order are places

and there are many order item to be placed at different location. There can be offers on items).

After explaining he asked me what tables would you like to used for online shopping like flipkart. He asked the the primary keys for every table and foreign key if there are any.

He then asked me about mapping of these keys and what type of mapping to be used here(one to one, many to many or many to one).

Then he asked me about my Codechef and spoj rating. Then he asked me 3 coding questions:

1 – <http://www.codechef.com/JULY14/problems/SGARDEN/>

2 – Simple dp question that a frog can take 1 or 2 step. Number of ways to reach nth position.

3 – Number of palindrome between 2 given numbers.

#### Technical + HR interview(F2F) –

He discuss everything about my project very deeply.

Then he asked a coding question.

<http://www.careercup.com/question?id=13394663>

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### Flipkart Interview | Set 9 (On-Campus)

I am 4th year undergrad. Recently Flipkart visited our campus.

#### Online Coding Round(on Interview Street)

There were 2 questions time limit 90mins –

1. A person wants to go from origin to a particular location, he can move in only 4 directions(i.e East, West, North, South) but his friend gave him a long route, help a person to find minimum Moves so that he can reach to the destination.

Input – NESNWES

Output – E

You need to print the lexicographically sorted string. Assume the string will have only 'E' 'N' 'S' 'W' characters.

E.g – SSSNEEEW

output – EESS

2. A sender will send a binary string to a receiver meanwhile he encrypt the digits. You are given a encrypted form of string. Now, the receiver needs to decode the string, and while decoding there were 2 approaches.

First, receiver will start with first character as 0;  $S[0] = 0$ ,  $P[1] = S[1] + S[0]$ ,  $P[2] = S[2] + S[1] + S[0]$  and so on.

Second, Receiver will start with first character as 1;  $S[0] = 1$ ,  $P[1] = S[1] + S[0]$ ,  $P[2] = S[2] + S[1] + S[0]$  and so on.

You need to print both the strings, after evaluation from both first and second technique. If any string will contain other than binary numbers you need to print NONE.

Input1; 0123210

Output: 0111000

NONE

explanation for NONE –  $S[0] = 1$ ,  $P[1] = S[1] + S[0]$  so  $S[1] = 0$

$P[2] = S[2] + S[1] + S[0]$  ,  $S[2] = 1$

$P[3] = S[3] + S[2] + S[1]$ ,  $S[3] = 2$ , not a binary character so NONE

#### Machine Coding Round (on Interview Street)

There was only one question, time limit 45mins

Q1. Word Wrap problem with few conditions, even i didnt remember much conditions here are some conditions.

i) there can be maximum of X characters in a single line.

ii) there can be maximum of Y number of spaces in the end of the each single line.

iii) if a string length is big enough, so that it cannot be printed in single line, use '-' in the end of the line and print string further in the different line.

also there should not be '-' consecutively in the end, if the string contains already '-' in the end dont put '-' character.

E.g. flip-kart and if x = 5 so it should be ->

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v) the cost value should be minimum, there can not be multiple answer for a single string.

Eg. This is a flipkart online programming test.

x = 10 Y = 3

Output

This is a

flipkart

online pr-

ogramming

test.

#### First Technical Interview (F2F)-

They asked me about myself, so i gave my brief intro to them(there were 2 people who were taking the interview)

and then they asked me about, what coding practices you used to do.As i dont do much coding online so i gave told them truely that only Codeforce and Spoj

After that they started my interview, that what is the approach that you had used in the Machine Coding Round and how you implemented and why you uses this type of technique.

My approach was Greedy.

Further they asked me what Data Structure you Know, how you use it some basic questions.

Later they asked me to print vertical nodes together in the binary tree, he asked me why you used Recursion in the solution.

After that they asked me a question, which was –

you are given an array(say C) of characters and an array(say M) which contains the indexes of the array of characters.

We started moving elements of array(C) according to the position of indexes given in the array(M).

e.g. array A – a b c d e f g

array M – 1 4 3 5 0 2 6

so array A will change in first to – e a f c b d g

again applying same – b e d f a c g

again applying – a b c d e f g

so after 3 times we got the same sequence of characters.

He wants minimum number of times modification on the array (A) so that the we will again reach to the initial order.

I gave him first recursive solution, then he says optimize it and after that i gave him O(n) solution; the logic for the problem came to me from Inplace Transpose of Matrix

the question is like -> <http://www.codechef.com/JULY14/problems/SGARDEN/>

After this he asked me a question on Next Greater Element, he wants how many ways i can handle this question.

I told him 3 approaches- 1.O( $n^2$ ) 2.O( $n\log n$ ) 3.O(n)

He asked me about AVL tree, how you will implement it and then said you have final interview in early morning ☺

#### Technical + HR interview(F2F) –

In this round, first they asked me about myself while studying My Resume

So they started asking some questions on LINUX – like what is gdm but i said sir didnt know much about linux.

further they asked me how to debug the code, and what is segmentation fault, memory leak and how you will find the segmentation fault in 5000lines of code.

after that they asked me about my projects, why this project how you did it... they grilled me in every step.. why this why not this and all..

after that he wants some optimization to be performed on the project.

After this they asked me some questions on stack while putting pressure of time that you have 2mins for this question.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview | Set 8 (For SDE 1)

Applied through LinkedIn

Online Coding Round (Interviewstreet)

=====

One of the many ways of representing a tree is to have an array(of length same as number of nodes), where each element in the node denotes the parent of that node.

Please note –

- \* An element with parent = -1 is the root element.
- \* An element with the least index becomes the left most child. (ie. a node with always be on left of all its siblings that have higher index than it)
- \* When printing a level of tree you need to maintain left to right order.

Eg –

- {-1, 0, 0, 1, 1} would represent a tree with –
- \* 0 as root
- \* 1 and 2 as children of 0
- \* 3 and 4 as children of 1

Given a similar representation, you have to print reverse level order traversal of the corresponding tree.

Level order traversal of a tree is where we traverse levels of tree one by one.

Eg –

For the above given tree, level order traversal would be –

0  
1 2  
3 4

And hence, the reverse level order traversal is –

3 4  
1 2  
0

Telephonic Round 1

=====

1. Find the square root of a given integer. e.g 27 output should be 5, for 32 output should be 6.

2. Given a 2D matrix of integers find the maximum sum path in the matrix.

Telephonic Round 2

=====

1. Given a number n, find the largest number small than having the same digits as of n. E.g. 231 output will be 213.

2. Given a long stream of numbers find the largest k numbers at any given point.(I told him I know the question and told the solution, he moved on).

3. Given k arrays of sorted integers, find the minimum range which contains the number from each of the k arrays.

e.g. {-1,4,7},{5,9,15,23},{8,24,25,31} output should be 2 range of {7,8,9}

4. Given a binary tree find all the nodes at k distance from a given node.

#### F2F-R1 Machine Coding Round

- =====
1. Create an employee database structure in which Employee has id,name,manager. Three functionalities required were
    - a) Given any id return all the employee details
    - b) Given any name(or id) list all the subordinates of the given employee.
    - c) Given a name search with prefix search property.

45 minutes of time was given and running code was asked. Interviewer first asked the approach and then after coding he reviewed the code thoroughly.

#### F2F-R2 Data Structure and Algorithm

- =====
1. Given a list of words and a 2D matrix(of characters) find all the valid words(present in the given list) which are possible inside the given matrix.  
Words can be formed in all 8 directions from a given cell.  
First discussion about approach and then implementation of the logic.
  2. Given a binary tree serialize the tree such that it can be retrieved in the same form again.
  3. Given a double linked list with one pointer pointing to the next node and the other pointer to any arbitrary node in the list, duplicate the given linked list.

#### F2F-R3 Hiring Manager

- =====
1. Introduction about the organization and the work being done.
  2. My introduction and the work done by me.
  3. Asked some of the new ideas ( wow!!!! features ) which can be implemented in the smart phone.
  4. Few other general questions.

#### F2F-R4 Design Round

- =====
1. Design the Tic-Toe game for a smart phone. Discussion about the class diagrams, structure of the code, code flow, abstraction of code and functionalities.
  2. Interviewer asked the approach to implement the above in android.
  3. Various android questions.

#### F2F-R5 Hiring Manager + Reporting Manager

Hiring manager was on leave so this happened after a gap of one month after R4.

1. Introduction about work.
2. I asked various questions about work and my role.
3. Design a mobile cab booking application (just screens and functionalities) on board. Asked questions about the things which I missed during the design.  
And what all requirements are needed to before the application goes in development phase.

Response was positive from the recruiter side.

=====

Thanks to all the contributors of GeeksforGeeks for bringing up this helpful platform for us. Hope to contribute further.

=====

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart  
Interview Experience

## Flipkart Interview | Set 7 (For SDE II)

### Online Coding round

1. Find all the Node at the distance K from a given node in a Binary tree. Print them in any order.
2. Design a LRU cache.

### Telephone screening rounds

1. Given two sorted linked lists. You start with a one of the two lists and then move till the end. You may switch to the other list only at the point of intersection (which mean the two node with the same value in different lists.) You have to find the path of maximum sum

#### Eg

1->3->30->90->120->240->511

0->3->12->32->90->125->240->249

You can switch at 3 90 or 240 so the max sum paths is

1->3->12->32->90->125->240->511

2. Design a contact list for a cell phone which can add & search really quick and is scalable.

### Machine coding round

1. Write a program which should create a parse tree, find invalid query and do some optimizations.

Input: fist line contains the list of columns. There will be subsequent lines which will contain the query as follows.

EMP\_ID, EMP\_NAME, EMP\_DEPT, EMP\_AGE

SELECT EMP\_ID,EMP\_NAME **where** EMP\_ID>5 AND EMP\_NAME='robert'

SELECT EMP\_AGE WHERE (EMP\_NAME='robert' AND EMP\_ID=5) AND

## ONSITE INTERVIEWS

1. Design a Synchronized Message broker queues. How will you handle various situations like one queue is down, automatic failover, active master selection, handling acked and unacked messages.
2. Design a site like book my show. It was an open ended question so I concentrated on inventory management. List all entities, classes objects modules and their interactions.
3. Design a secure Card storage system. Again open ended but the concentration was on encryption and decryption
4. HR round. What are your strength and weaknesses, what did you do that made you happy. What was your best contribution till date.
5. Design a Traffic signal. List all entities and classes involved. How will you handle pedestrian crossings etc.
6. Design a game of tic tac toe, handling winning situation etc. NXN, multiplayer, multiplayer with synchronization, Disaster recovery, data analytics, SWOT of each approach.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Flipkart

## Flipkart Interview | Set 6

### Online Round:

1. Don't remember the questions, but they were of medium level, not tough as such.
2. Basic knowledge will help you in clearing that round

### 1st Telephonic

1. Solve Snakes and ladder problem, Given all the inputs for the board.  
We can roll the dice, as we want to. Need to find the shortest path to reach the 100 level from the starting of the path. Various other questions were asked on the basis of that only.
2. Given a file with millions of words, need to find top K words on the basis of occurrence.

### 2nd Telephonic

1. Given a list a1,a2,a3....an. Comparison between elements is given like a1>a2, a3>a5, a4>a2.....etc. We need to find whether there is any situation that we can sort the list in the ascending order on the basis of comparison. Yes or No, explain the conditions
2. Given a string example : shoppingwithflipkartiseeasy, Now we are given this string and a dictionary containing valid words, now we need to break the sentence into words separated by space. Output : shopping with flipkart is easy

### Onsite

#### Coding Round

1. Need to write a fully functionally and working code for a problem statement. Problem is to write the code for maintaining a directory for any organization where employee will have id, name, post and manager as attribute. Basically two features need to be implemented: (a). Should be able to do searching on the basis of name, prefix search for the name should also be supported, (b). For any employee, we can get the list of all the subordinates which comes under him/her, like for ceo, all the employees list should get displayed
2. No database is needed, memory storage was asked to used for this
3. Code should be extendable so that new attributes for the employee can be added
4. Approach for maintaining the structure and optimality in searching for required.

#### Face to Face

1. Given a file containing billions of words, need to find top K words. Other variations like the file size is 100 MB and we can read only a chunk of data at a time, how to maintain that, etc
2. Given a series 2,3,4,5,6,8,9,10,....., here in this series all the numbers are present which have factors only and only either 2,3 or 5. Need to write a node to generate nth number for the series. With best approach and complexity
3. Given a Alien language, we have the dictionary of that language, but we have only very few words, but they are all arranged in the lexicographical order. We need to first find whether we will be able to get a alphabetical order or not, if yes explain approach

#### Hiring Manager Round(Skype Round)

1. Most of the questions are on the cultural fit only, but they were tough
2. Situational and behavioural questions he asked, positive attitude and calmness is really required at that time.
3. I also asked many questions regarding work and etc.

Finally few weeks later, got a call from HR and manager regarding offer and figures.

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.

## GATE CS Corner Company Wise Coding Practice

## Flipkart Interview | Set 5 (Off-Campus for SDE-1)

I recently attended Flipkart interviews(off campus). I would like to share my experience with everyone.

### Round 1 : Telephonic Interview

- 1) Print the left view of a tree.
- 2) Given set of words that are lexicographically sorted, find the grammar.

Eg:

abc

acd

bcc

bed

bdc

dab

The order of letters for the given example would be

a->b->c->e->d

### Round 2: Telephonic Interview

- 1) Find the largest basin size in a given matrix.

9 9 9 8 8 8

8 8 8 7 7 7

7 7 7 7 7 7

8 8 8 8 9 9

5 5 5 5 6 3

5 5 5 3 3 3

For the above example, the highlighted values form the maximum size basin.

- 2) Given a sentence and a set of characters. Find the minimum window within which the set of characters can be found in the sentence in any order.

- 3) In a client-server architecture, there are multiple requests from multiple clients to the server. The server should maintain the response times of all the requests in the previous hour. What data structure and algo will be used for this? Also, the average response time needs to be maintained and has to be retrieved in O(1).

The HR sent a mail within 2 days that I was shortlisted for the onsite interviews.

They arrange flight travel to Bangalore, cab facility and accommodation if required.

### In-House Round 1: Coding Round (2 hours)

I was asked to write code to parse an XML and do the following options by not hardcoding any value.

- 1) Validate the XML.
- 2) Given a level number, print all values of tags in the same level.
- 3) Search
  - a tag name for a given value
  - for value of any tag given a value of tag at any sub levels.

First there was discussion as to how to go about the problem and the algorithm. Then 1 hour for coding the solution. Finally the code was evaluated and some extensions to the solutions were discussed

### In-House Round 2: Hiring Manager (45 mins)

The Hiring Manager was on leave and hence had the interview via phone. This round was a cultural fit round. The manager checks whether we will fit into the company's work environment. Few questions like,

- 1) Some unix commands since they work extensively on UNIX platforms.

- 2) Achievements.

- 3) Details on previous projects.

- 4) Most challenging situation.

- 5) Estimations that need to be done for a project and considerations

Some more questions like these.

### In-House Round 3: PS & DS Algo (1 hour)

- 1) Merge k sorted arrays.
- 2) Given a tree with edge weights, find any path in the tree with maximum sum of edges.
- 3) Given a maze, a start point and end point find the shortest path to reach the end point from the starting point.
- 4) Given a polygon and a point, find whether the point lies within the polygon or not.

After a week, the HR contacted me and I got through the interviews.

Excellent facilities and salary package for candidates who get selected.

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## Flipkart Interview | Set 4 (For SDE-1)

Company: Flipkart

Profile: SDE 1

Experience: 7 months

### Round 1: Online Coding Exam (2 hour on interviewstreet)

(Need to pass 4 test cases + if time permits 4 hidden test cases)

Q.) There are two strings s1 and s2. Find the maximum of percentage word matching from s1 to s2 and s2 to s1.

Where, percentage word matching= (Total words matched in s2/total number of words in s1) \*100

### Round 2: 1st Telephonic interview

Q1) Generate all numbers in ascending order which are having factors as 2,3 and 5. Discuss various approaches.

Q2) Check whether given Binary Tree is a Binary Search Tree. Discuss various approaches.

Q3) I don't remember

### Round 3: 2nd Telephonic interview

Q1) some scenario interviewer described on phone had to identify data structure to model it and algorithm to solve. Data structure used: Graph and algorithm used:

Topological sort

Q2) Given N meeting with their start time s1, s2 ...sn and end time e1, e2 ...en and K rooms. How to schedule maximum of N meetings in k rooms. (Concept: Interval partitioning using greedy approach).

Called for onsite interview. All expenses flight, hotel, cab etc..were taken care by company.

### Round 4: 1st f2f interview (Machine Coding round) (1hour 10 min)

Given a string regex and another string pat find whether the pattern is acceptable against given regex string.

Regex string contains following characters and special characters:

1. Normal alphabets – a to z and A to Z
2. '\$' – all string should end with all characters preceding \$

Example:

Regex :abc\$ ,

Pattern: abcd(Not acceptable) , abc(acceptable), ab(Not acceptable), dhfusdhabc(acceptable) etc..

3. '^' – all string should start with all characters exceeding ^

Example: Regex :^abc

Pattern: abcd(acceptable) , abc(acceptable), ab(Not acceptable), dhfusdhabc(NOT acceptable) etc..

Regex: ^ then only pattern acceptable is null.

4. '.' – any character can be mapped to dot except null

Example 1: Regex : .abc

Pattern: Zabc(acceptable) , abc(NOT acceptable), ab(Not acceptable), habc(acceptable) etc..

Example 2: Regex :a.bc

Pattern: abc(NOT acceptable) , aXbc(acceptable), ab(Not acceptable), habc(NOT acceptable) etc..

5. '\*'–the character just preceding \* can be repeated n time where (n>=0)

Example 1: Regex :abc\*de

Pattern: abcccccccdde (acceptable), abcde(acceptable), abcccd(not acceptable)

Code should follow OOPS principle such as modularity (make each function for each special character), encapsulation etc.

Further discussion on improving the code and how would other person can see the code and add other functions to it.

### Round 5: 2nd f2f interview (Problem solving and data structure round) (1 – 1.5 hr)

Q1). Generate n numbers in ascending order which are having given k factors. Discuss various approaches. Discussed on various approaches.

I told 3 approaches:

Naïve approach—O(nk)

Heap approach — O(nlogk),

Linear time — O(n)

Q2). Given set of words which I have to treat as dictionary as new lexicographic order. I have to learn from set of string as print lexicographic order of each character.

(Topological sort) (<http://www.geeksforgeeks.org/topological-sorting/>)

Q3) <http://www.geeksforgeeks.org/flipkart-interview-set-3/>—> Round 1 , Question 3(<http://www.geeksforgeeks.org/topological-sorting/>)

### Round 6: 3rdf2f interview (Hiring Manager Round) (1 – 1.5 hr)

Tell me about yourself.

About your hobbies, your ideal

Discussed every minute details about my one published research IEEE paper.

Why you want to join Flipkart?

Why you are leaving your previous company within just 7 months?

etc. etc.....

### Round 7: 3rdTelephonic interview (Reporting Manager Round) (1.5 hr)

Discussed about product life cycle in a product based company and consultancy based company.

Work flow, Flipkart hierarchy.

Compensation details.

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### Flipkart Interview | Set 3

Recently I appeared for Flipkart Interview. I would like to share my experience.

#### Round-1: Telephonic (45 mins)

1. Given an array of n distinct integers sorted in ascending order. Find an index i s.t ar[i] = i. Return -1 if no such index exists. Note that integers in array can be negative.

2. Design a stack which holds an integer value such that getMinimum() function should return the minimum element in the stack.

FOLLOW UP: Implement popMin() function which would pop minimum element from the original stack. O(1) implementation was required.(Hint: Use LinkedList to implement stack and store address of minimum element node in min-stack)

3. Print an organisational hierarchy.

Naveen manages Satish

Satish manages Anushree

Satish manages Sandeep

Gurinder manages Naveen

Gurinder->Naveen

Naveen->Satish

Satish->Anushree,Sandeep

Anushree->

Sandeep->

#### Round-2: Telephonic (30 mins)

1. Given an array which is first strictly increasing and then strictly decreasing. Find an element in this array.Discussions on various approaches and their complexities.

After these two rounds, I was called for Face-2-Face discussions in Bangalore. There I had 4 rounds.

#### Round-3: In-House Coding(1 Hour 45 mins)

Write a running code in any language to implement the famous tic-tac-toe game.

First there was discussion on various approaches and basic functions which would be required to implement the same. Then I was asked to code.

I was given 1 hour 15 mins to code this.I had to design this game as per following:

- 1) Game has 3 modes: Human Vs Human, Human Vs Computer and Computer Vs Computer.
- 2) Initially start with 3X3 grid, but it can be generalised to NXN grid. So don't hardcode any variable.
- 3) Minimise Code Redundancy and try to make it as modular as possible.
- 4) Try to use abstraction and expose lesser number of functions(APIs) to outside world.
- 5) Try to cover maximum number of edge cases, like when to abort the game, draw condition, win condition, overwriting existing value in grid etc)

After I wrote running code for the same, I was told to explain my code and then run with some test cases. Then he asked me to mail the code.

#### Round-4: Data Structure and Problem Solving(1 Hour)

1. Given a sorted and rotated array. Find an element in this array.(Famous Problem)

2. This was an interesting problem. Given a set of intervals like 5-10, 15-20, 25-40, 30-45, 50-100. Find the ith smallest number in these intervals.

Assume there are no duplicate numbers.

e.g: 1st smallest number = 5  
6th smallest number = 10  
7th smallest number = 15 and so on.

I told him that we would first sort the interval on basis of starting numbers. Then merge overlapping intervals to get a set of non-overlapping intervals like 5-10, 15-20, 25-45, 50-100. Now we can find the ith smallest number after finding the appropriate interval.

FOLLOW UP: He then modified this question to accommodate duplicate numbers also.

Suppose we have intervals like 5-10, 8-12.  
Then total numbers in these two intervals would be: {5,6,7,8,8,9,9,10,10,11,12}  
So, 1st smallest number: 5  
4th smallest number: 8  
5th smallest number: 8 (here is the change since now we have duplicate elements also) and so on.

3. Given a dictionary of 50,000 words. Given a phrase without spaces, add spaces to make it a proper sentence.

e.g:input: thequickbrownfoxjumpoverlazydog  
output: the quick brown fox jump over lazy dog

FOLLOW UP Questions:

- 1) Worst case complexity of finding a word in HASHMAP given we have 'B' buckets and total of 50,000 words. ( Ans: O(50,000/B) )
- 2) Complexity of finding a word in TRIE. (Ans: O(Word Length) )
- 3) Advantages of TRIE over HASHMAP and some similar discussions.

#### **Round-5: Hiring Manager Round(45 mins)**

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He asked me lots of questions regarding my current company projects.

Questions:

1. My role in current project.
2. Most Challenging work in your company.
3. What technologies you learnt last year? and several similar questions.

#### **Round-6: HR Round (10 mins)**

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common HR questions like why Flipkart, Why should we hire you etc.

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## **Flipkart Interview | Set 2 (For SDE 1)**

Hi, I had Flipkart interviews for SDE 1. I would like to share my experience.

### **Online Coding Round (1 hour 30 minutes):**

On interviewstreet, there were 2 problems.

- 1) It was long description for a DNA problem. Main DNA sequence(a string) is given (let say strDNA) and another string to search for(let say strPat). You have to find the minimum length window in strDNA where strPat is subsequence.
- 2) There is a zoo and there are several groups(number of groups:K) of people for tour. Each group is having different size (g1,g2,g3...gK). There is one bus with capacity C. Journey starts from a point and bus will come back to the same point. A group can only be included in the bus if all the members of the groups can be accumulated in bus. After coming back from the tour, each group in the bus will again wait in the queue at the bus-stand. Bus-driver earns a rupee for each person travelled. You have to find the earning of the bus driver after R rounds.

For example :

Number of groups G = 4

Group size for each group : 2 4 3 5

Bus capacity : 7

Number of rounds R : 4

queue : (from front side) 2 4 3 5

First round : 2 4 (we can't take 3rd group as 3 members can't be accumulated after 2 and 4.)

queue : 3 5 2 4 (1st and 2nd group are enqueued. i.e. 2 and 4)

Second round : 3

queue : 5 2 4 3

Third Round : 5 2

queue : 4 3 5 2

Fourth Round : 4 3

After 4 rounds, total earning is 6+3+7+7 = 23.

### **Coding round 1 (1 hour) :**

Input :

List of edges are given in the format (source,destination)  $\rightarrow$  (s1,d1) (s2,d2)...

There are some error codes with priority.

1 – Loop

2 – Multiple roots

3 – More than two children

Output :

Indicate the error (considering the priority) in case of any error and exit the program.

Print the tree structure in the bracket notation in case of no errors.

(e.g. (A(B(D)(E))(C(F)(G))) .. Here A is root. B and C are children of A. D and E are children of B. F and G are children of C.)

#### Coding round 2 (1 hour) :

Design and code the sudoku solver.

#### Coding round 3 (on skype) (1 hour 15 minutes) :

There were two problems.

- 1) A document and a list of words are given. You have to find minimum length window in the document where all the words can be found.
- 2) 2-D matrix is given where each cell represents height of cell. Water can flow from cell with higher height to lower one. A basin is when there is no cell with lower height in the neighbours (left,right,up,down,diagonal). You have to find maximum size basin block.

Example :

```
9 9 9 8 7 7  
8 8 7 7 7 8  
8 8 8 7 7 7  
8 8 8 9 9 9  
8 8 8 7 7 7  
4 4 5 5 5 5  
5 5 5 6 6 7  
5 5 5 8 8 6
```

Here there are two basins.

```
9 9 9 8 7  
8 8 7 7 8  
8 8 8 7 7  
8 8 8 9 9 9  
8 8 8 7 7 7  
4 4 5 5 5 5  
5 5 5 6 6 7  
5 5 5 8 8 6
```

Maximum basin block size : 8

#### HR+Technical interview (on skype) (1 hour)

- HR questions (strengths, weaknesses, why flipkart ?, what kind of env. you like for work ? etc.)
- Projects (I explained 2 projects from start to end. They asked me challenges and how you dealt with them etc.)
- Multithreading and its examples

After few days, I got an offer (:). Thank you so much geeksforgeeks for great help. It was awesome experience. It totally changed my thought process by solving the programming problems level by level and with deep understanding of solution for each problem. Many Many congratulations to the Author.

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## Flipkart Interview | Set 1 (For SDE 2)

Hi, I was interviewed for Flipkart SDE 2 role 2 months back. I want to share interview experience with other geeks.

#### Telephonic Interview (45 minutes)

(1) There is a stream of characters and at any time we need to find and remove (means set occurrence = 0) character which has maximum occurrence till now. Design data structure and algorithm for same. (I used standard Heap and Hash table setup, then was asked if we can replace  $O(n \log n)$  Heap operations with some efficient operation in practical scenario. I came up with doubly linked list and moving character to front on basis of its occurrences).

(2) Given a gold mine of  $n*m$  dimension. Each field in this mine contains an integer which is amount of gold in tons. Initially miner is in first column but could be at any row i. He can move only (right ->, right up /, right down \). Find out maximum amount of gold he can collect and path followed by him.

(3) Given two string str and pat. Find minimum window in str which contains all characters from string pat.

#### Problem Solving Round: (1 hour 30 minutes)

(1) Given a dictionary of unknown language and characters. Find out order between characters.

Example :

ab

bcd

ce

de

Output : a, b, c, d, e

(2) Given two trees, superimpose them. If not possible to superimpose raise exception.

**Example:**

2	2	2
---	---	---

/	\	=>	/\
1	5		1 5
5	2		
/	\	=>	<b>Not superimposable</b>
1	5		

(3) Given a review paragraph and keywords, find minimum length snippet from paragraph which contains all keywords in any order.

(4) Extended question 3 if there are millions of review, what preprocessing step would you do.

#### Coding Round: (1 hour 30 minutes)

Given list of expressions:

```
a = 10
b = a++
c = a + b
d = c*b + a*c
```

Print out value of last variable (in our example, it is d). First illustrate algorithm and then code in 1 hour.

#### Managerial Round: (1 hour)

Designing of all previous products I have worked on.

#### Design Round: (1 hour)

Design Snake and Ladder game.

Expose api to outer world.

Build following from exposed api:

- (1) iOS app
- (2) Web app
- (3) Desktop app

#### HR Round: (15 minutes)

Why would you join Flipkart if you would have offer from Google and Facebook?

Why you want to join Flipkart?

After few days I received offer. Thank you Geeks as reading geeksforgeeks was wonderful and great learning experience and helped in preparation for interview.

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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Flipkart

### [TopTalent.in] How Flipkart gets the best out of their applicants

Flipkart is certainly one of the most amazing companies to work for in recent times. The startup environment, great people and the enthusiasm really gets to you. As it takes new strides to becoming a giant in the ecommerce space with new products every month (like ebooks recently), it needs highly qualified professionals to sustain this growth. Here is how it's like to interview with Flipkart for a software engineering role.

#### Going through the rounds

Flipkart, like most companies, had multiple rounds of interviews. First in the list was an online round in which the candidates had to attempt 30 Multiple Choice Questions and 2 programs to do in 90 minutes. Major topics that most of the questions were based on were the general concepts of Aptitude, C Language, Object Oriented Programming, Data Structures, Operating Systems and Databases.

This was followed by another written round in which they asked a programming question. Applicants had to face three rounds of technical interviews. These concentrated heavily on general algorithm designing. The problems given primarily tested Recursion Techniques, Greedy Techniques and Dynamic Approach to design an efficient algorithm.

Best part? They kept guiding the candidate if he/she got lost anywhere in the process.

Flipkart recruiters mainly tested on how we think when solving a problem. It's not that you should know a lot of things, but you should be able to apply whatever you know. At many occasions hints and directions like "Think like this....." and then find a better solution were provided. They want to get the best out of you during the interview, so just go across different problems and try to apply your knowledge of algorithms into different applications.

The written round tests the basics and the interviews test how he/she applies different techniques and methods to develop an efficient algorithm for a problem. They mainly focus on your thinking process, so I would suggest keep speaking your ideas continuously during your interview. If you go wrong they will guide you.

#### Advice and Tips

One should be clear in the basics of any preferable language. He/she should be able to think and apply the knowledge of one concept in another situation. No one will ask anything straight from the book. All Books can give you so much – standard algorithms and standard problems. From there on, it's the candidate's skill that will decide his performance. It is you who has to decide given a problem which method will be most feasible and fastest.

So the advice would be to see different problems on greedy techniques and dynamic programming using recursion. And try to understand why a particular technique was used and why other techniques would have given poor results. This will help in thinking wide when you come across a problem.

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### Nvidia Interview | Set 3 (On Campus)

I had a campus interview of Nvidia Software profile for their infrastructure team at Bangalore and here is my experience.

#### Written Test

15 questions on C/C++ that dealt with Bit manipulations, C++ concepts, Virtual functions, abstract classes, output programs, extern variables, Compilation errors etc.

Around 10 questions on Data structures that had questions from sorting, heaps, and other concepts of DS.

Around 8 questions on OS that included questions on semaphores, TLB, threads, process scheduling etc.

8 questions on analytical ability that included a few quantitative puzzles and some logical reasoning.

Overall the level of questions were good as all of them made us think.

20 students were shortlisted for interviews. I had topped this list 😊

Interviews were conducted by 2 separate teams. Each team interviewed a candidate at most once.

#### Round 1:

Before entering the room they had analyzed my CV.

1) Why are your grades low in the first few sems? I explained that I did a few projects that diverted my focus from academics.

2) They noticed that I had published a paper in electronics so they asked me to explain in depth the work done for it.

3) Questions on a few more projects.

4) Find the 3/4th node in a linked list.

5) Which of the following sorting algorithms uses the least number of swap operations. a. Heapsort b. Selection sort c. Quicksort d. Insertion sort

I had answered this question incorrectly in my written test so had to find the correct solution in front of them.

6) Memory map of a C program.

7) Concepts of C++ like Virtual functions, Inheritance, Constructors, static variables etc.

8) How are virtual functions actually implemented. Ans- Virtual pointer table

9) Given two different processes wanting to read each others variables that were defined in their source code. How can we implement that?

10) Do you want to go for higher education?

11) I was asked that even though I had a strong hardware profile why was I interested in NVIDIA software. I replied that both of my skillsets were strong and would be put to good use at NVIDIA which works on both of them.

11) A few more DS questions that I don't remember.

I was shortlist for the second round

#### Round 2:

This was taken by a senior engineer

1) Tell me about yourself. I tried to show them that I am passionate for NVIDIA.

2) What is NVIDIA CUDA? I was asked this as I had mentioned it in my resume.

3) Write a sample program in CUDA. I wrote a reduce function to sum an array.

4) How do we synchronize threads in CUDA?

5) Find output of a given program which had static variables in recursion.

6) I had mentioned that I simulated multi-planetary orbits in a project and interviewer looked particularly interested in it so I was asked questions about ellipses, their foci. radius and eccentricity.

7) Explain how virtual functions works by writing a sample program.

8) What are virtual destructors? (I had no idea)

9) Give an example of runtime polymorphism in C++. I said we can achieve this using function pointers. Not sure if correct.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Nvidia

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### Nvidia Interview | Set 2 (On Campus for R & D Team, Pune)

#### Aptitude Test (60 min):

4 sections, no negative marking but they had sectional cut-off.

Section 1 (C, C++):

15 questions.

Mainly questions of type what will be output of following, type of error.(compile time or run time ,etc.) [Do pointers, pointer to functions and OOP concepts in detail]

This section was quite easy.

Section 2 (Operating System):

## **10 questions.**

Questions on deadlock, process scheduling, priority inversion , look-aside buffer memory, etc.

This section wasn't that easy.....

## **Section 3 (Data Structures):**

### **8 questions.**

DSA questions on sorting, searching , graph traversal (BFS n DFS),Minimum spanning tree (Prim and Kruskal algo), Shortest path(Dijkstra's algo).

Time complexity related questions and applications of all above mentioned topics. No straight forward questions.

Toughest section of apti.

## **Section 4 (Quant):**

### **8 questions.**

Questions on probability, series , simple logic puzzles.

Easiest section of apti.

No. of people shortlisted after the aptitude test = 20

## **Coding Test (2 Questions 30 min)**

3 questions were there out of which we had to solve only 2

1. Implement stack (push and pop) operations using linked list.
2. Find the first non-repeating character in a given string in O(n) time complexity.
3. Given co-ordinates of two rectangles find co-ordinates of intersecting rectangle.

No shortlist after this test.

## **Interviews:**

### **ROUND 1 (Technical Interview):**

Questions:

1. Tell me about yourself
2. What is your goal?
3. Find whether no. is even or odd...(I gave mod2 solution)
4. Then he asked about machine cycles required registers required ....what exactly happens at os level.....then drawbacks of all these....
5. So asked to give another solution to do same....so I suggested (X &1)....
6. He said still it require 1 extra register.... I gave another solution using shift operator
7. What are sockets, pipes, inter-process communication?
8. What is little endian and big endian?
9. WAP to determine whether your system is little endian or big endian?
10. Convert little endian to big endian in constant time.
11. I asked what does nvidia exactly do in s/w development section?
12. He asked to give my opinion .... I told they take diff OS n optimize them to work more efficiently (in terms of time and memory) with nvidia cards and GPUs.
13. He said your guess is correct....and explained even more.

**They shortlisted 7 people from this round.**

### **ROUND 2 (Technical Interview):**

Questions:

1. Volatile memory and volatile variables.
2. Function pointers and one program to implement function pointer.
3. Uses of function pointer...(I said to send a function as argument)....he asked more...(I told that I know only one)
4. What is polymorphism? What is virtual function...? How will you implement if I tell you to develop compiler?  
I said, I will maintain a static table to store pointers of virtual functions for each class...so it can be accessed by all objects....and my call to virtual function will be converted as....  
`p->fun_ptr->fun()`....where p is my pointer to object.(He said this is another use of function pointer)
5. What is function template? Do you know what exactly happen when template is executed? If you don't then tell how will you do that?
6. What happens in recursive function calls? What are the drawbacks?
7. What is process, Thread? What is multi-threading?
8. Design data structure to implement multi-threading.
9. Can you find maximum stack memory available using above data structure....I said....can be....and told how I will do that....(pure imagination it was)...he was impressed
10. He was going too deep at OS level....mainly kernel part....how kernel manages all processes?
11. Thread scheduling....difference between process and thread scheduling.
12. Storage classes in C++....on which part of memory these variables are stored?
13. What is malloc, calloc function?
14. Memory allocation in struct? Why it is like that....why continuous memory is not allocated to struct variables?  
It is like that so the variable can be fetched in single machine cycle...else it may require more than one increasing processing time.
15. Implement your own malloc function such that it will allocate memory of 16 bytes and starting address will always be divisible by 16.....was told to write code.
16. What exactly happens as we free up dynamically allocated memory using free()  
I told OS allocate the block of memory to some other process.
17. In class of 100 students there are 24 girls and 32 boys....no 3rd gender person.....  
I gave him confused look....and asked how it is possible...? He said that is the question...you tell me....and told me to write equation....  
I wrote on paper..... $32 + 24 = 100$   
I got a spark ....and I said it is possible only if these are the numbers to base 6....  
He said,"Yes....you got it."

18. Asked about my code which I wrote in coding test.....he doubted on that....I proved it works for all test cases....showed him with some test cases.
19. Again a puzzle... On my birthday party he was invited....so he took a rectangular cake for me....but on the way he was so hungry that he ate a rectangular piece of cake.....The cut piece can be of any size and orientation. I was only allowed to make one straight vertical cut so that I and my sister will get same amount of cake. My answer ... In general, when a straight cut is made at any angle through the centre of a rectangle, the resulting pieces are always of equal area. So let's consider our situation. What if we make a straight cut such that it passes through the centre of both the rectangles?

#### **ROUND 3 (HR Interview):**

Questions:

1. How was the day?
2. How was apti, coding test, and entire selection procedure?
3. Asked me if I have brother and/or sister...then about parents.
4. What does your father expect from you?

I answered this in Marathi then translated to English.

5. Asked about future studies.....why I want to work and not want to go for PG.

6. Asked about my interests....

7. Are you a good cook? Tell me your special items that other love to eat?

8. Asked whether I have interest in sports...then we had discussion on badminton and gymnastics....He asked rules of badminton.

9. Asked whether I follow news....followed by long discussion on elections, Mr. Narendra Modi and his Gujarat.

10. What is your goal? What you want to achieve?

I said to do something technological breakthrough or want an algo on my name....then our discussion moved to NP-complete problems.

The guy didn't know anything about it....so started explaining him about NP-complete problems.

11. More questions about family.

12. Asked "Are you \*\*\*\*\*guy???" I didn't know that word...I asked him what that word mean....He thought something....then seeing ring (Ruby) in my finger....He asked "Do you believe wearing this ring really helps you???"....

I said "Yess"....as I wore it on that day only.

13. Biggest achievement in your life? Why do you think it is bigger than others?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Nvidia

## **Nvidia Interview | Set 1**

Following is my interview experience for NVIDIA internship.

I faced three telephonic rounds in my room.

#### **Round 1:**

Round 1 was a combination of HR and Technical.

In this round, I was asked about myself and about my Project. The interviewer was all the time asking about my project during 20 min (because my project was related to NVIDIA), and in last 15 minutes, he asked me simple questions on C/C++.

Question 1 You are given two Vectors of number, how will you get Dot product? [Dot product of vectors :)]

Question 2: How will you allocate dynamic memory for two dimensional array

Question 3 : Do you Know ASM Language (I said very little). So he asked me to do Question 1 in ASM (I have told him basic logic that how can we do it in ASM)

Now he asked me, if Numbers in Vectors are n=16 bit long then the resultant Number of bits?

[Ans: 3n-2 where n is number of bits in numbers]

#### **Round 2:**

1. Difference between Macro and Function [he required a deep knowledge of it, so I answered in terms of Compile time execution, run time execution, Stacks and Instruction pointer (Program Counter)]

2. Write a function to calculate Compound Interest with restriction. [I told him sorry sir I forgot formula of it, so he gave me formula for compound interest,  $t = P \cdot (1 + (r/n)^nt)$ ]

3. You have a silver rod of 7 inches, now a person visit your home and ask for 1 inch of rod every day in a week. How much minimum number of cuts required in a Week? [Ans. Is in power of Two 1,2,4 (can you find why? Try ok)]

Tip:- Questions Like this, always have ans in "Power of Two"

4. A program in CUDA C (Project).

5. How many number of Zero's are there in 100!, and how will you calculate it?

[Easy one: Divide by 5 again and again and add all them] so he asked me how I come to know, so I explained.

#### **Round 3:**

This round was totally based on my project and two aptitude question asked to me at last

1. You have given a number such that

$N = 1! + 2! + \dots + 58!$  now what is the remainder after dividing it by 56?

[Ans. apply 56 divisible method (break 56 in two co-prime number 7 and 8) then divide by them and calculate it ]

2. You have Given a Cuboid Cake and a little child comes and cuts a little cuboid piece of cake , Now your task is to divide the remaining Cake in One shot in two equal Parts [first I gave him 2 wrong ans. he said me 'try again' and at last, I have him a correct ans. Answer:- Cut the cake with line joining the mid-point of that rectangle and cake.

Finally I asked two questions related to the new release of Architecture Keplar. The interviewer was cool guy.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Nvidia

# Qualcomm Interview Experience | Set 8 (Experienced)

It was really good experience at Qualcomm. I was interviewed for Associate Software Engineer and have an experience of an year, first by telephonic round and then F2F interview.

### Round-1 Telephonic around: 70 minutes (Taken by 2 persons)

1. All they asked at first was about Projects done in my company and at college level.
2. Then main thing they ask was OS and its concepts:
  - a. Memory management.
  - b. CPU scheduling.
  - c. Deadlock and its real time examples.
  - d. Questions on how two processes can communicate in OS, give different ways.
3. Coding questions:
  - a. Reverse a linked list. (<http://www.geeksforgeeks.org/write-a-recursive-function-to-print-reverse-of-a-linked-list/>)
  - b. Print left view of a binary tree. (<http://www.geeksforgeeks.org/print-left-view-binary-tree/>)
  - c. Implement your own memcpy.

After completion of this round they asked me if I can travel to Hyderabad for further rounds. At 7th January 2017 I gave F2F interview.

### Round-2 F2F:120 minutes

He started with simple intro then explained me the position for which interview was going on.

1. Then after he asked me about all of the projects on which I have worked till this time.  
He also asked different situations like how you use to fix the issues of memory overflow, crashes in your current company.
2. Questions on big and little endian:
  - a. Their notation and what are the different OS which one is big endian and which one is little endian.
  - b. You have one code now this code must work on both little and big endian in same way how will you do that: I gave solution of having different macros for different OS like for linux, windows it will work as little endian and another macro for SUN and motorola OS it will work as big endian.
  - c. Some more explanations on this topic only.
3. Find the word in given para :

This is my island of love and it is meant for kids of 10 years.

Now you have to find word 'is' in this given para(word can come in other word) whose count is 4. Then implement the same logic, if you have to find 'is' if it separate word.

They asked me the different solutions for this question using "strcmp" and your own logic.

I gave solutions via hashMap and normal word searching and strcmp.

4. He gave me 10 output questions based on pointers.
5. Again he asked me some basic questions on programming like one x.h file is included in another y.cpp file and x.h file is included in z.h file and z.h is included in a.cpp now asked me several questions like which file have which variable accessed and what is the order of print statements and etc questions.

### Round-3 F2F: 80 minutes

In this round he asked me about questions asked in previous round.

1. Then he started with questions on OS
  - a. Process and thread difference.
  - b. How will you handle 2 thread working on same MAP. Then asked several questions on mutex and different types of locking systems.
  - c. Questions on Storage classes in C.
2. Reverse the bits of a number. (<http://www.geeksforgeeks.org/write-an-efficient-c-program-to-reverse-bits-of-a-number/>)
3. <http://www.geeksforgeeks.org/find-distance-two-given-nodes/>

In the above question he asked me about call stack of the program.

4. Use of stack and queue DS.
5. Difference between stack and heap memory. Asked me to explain by writing a simple program.
6. Questions on Function pointers and usage.

### Round-4 F2F: 80 minutes

This round was more logical and was tough because in this round I was asked basic questions on pointers and how memory is accessed by different functions.

1. He asked me to explain Inline function. Then asked me which are the cases where inline would not work. He asked me internals of inline how it works and why this function works more faster than any other normal function. He asked me is there is any common thing between function pointer and inline function.  
Afterwards he also explained some points in this topic to me.
2. He told me to write my own sizeof operator (<http://www.geeksforgeeks.org/implement-your-own-sizeof/>)
3. Program to Detect loop in a circular linked list.
4. He also asked the question : Reverse the bits of a number and count the number of set bits in the given number.

5. Many questions on static variable and static function.

#### Round-5 F2F: 20-30 minutes [Manager round, HR round]

1. He asked me about my previous company and projects done there.

2. Then explained about the position.

3. He asked me about my joining and all and all basic questions is work interesting or not.

4. Why Qualcomm? Relocation? salary expectation?

NOTE: One must be clear with pointers and memory management and DS questions. Basics of C is they ask a lot.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Qualcomm

### Qualcomm Interview Experience | Set 7 (Off-Campus)

It was a very good experience to face interview at Qualcomm (Hyderabad-2016)

I have attended the interview for a position of Software Engineer and My experience and Questions are mentioned below.

#### Round-1 Telephonic around (40min to 1hr) Medium level.

- All about your CV
- Lots of questions on project and how it works actually
- OS concepts and real examples
- Deadlock situations (detection ,prevention)
- Sw watchdog timers
- OS schedulers and algos
- Error handling in the system , Core dumps ,etc
- Memory management concepts
- Mutex/critical section/semaphores
- Dsp processor, pipeline, and serial IC
- 3 Coding questions ([LinkedList](#), [stack](#) based, and [string](#) based).

Note: All round questions were asked deeply and need to tell him until he convinced with the answers. After 7 days I got a call to come down to Qcom office for next rounds. That day went from 10 to 4 clock break only for lunch.

#### Round 1 (2 person took from 10 to 12.30):

- Started with my resume, asked questions on my internship projects, main projects.
- Basics of [C programming](#).
- 5 coding questions ([bit wise](#), [Fibonacci](#), [LinkedList](#), [trees](#), and [pattern recognition](#))
- Then started with os concepts, scheduling algorithms, best data structure for real time scheduling.  
Memory map of program, Storage classes and their mapping
- If we declare more number of variables than the registers available on the processor? Where they will be stored.
- IPC (signal, as I coded in this) how actually it does transfer of memory
- Set of C code snippets given to debug ... Identify problems in it and tell outputs
- Memory questions like Best fit, worst fit, average fit questions.

And further questions on that.. like why?

#### Round 2 (coding):

- Basic C questions and resume questions
- Write a program to Delete a node, given only a pointer to the node in a Circular linked list
- How to access data in the called functions after returning from it (point here is that, cannot access auto variables in functions after it is being called off )
- Write a program to return a stream of bytes from a function
- Lots of questions on Function pointers, how, usage, examples
- There was an IPL tournament, after every match you have to find the team with max points. You have to tell logic first then code it.
- [LinkedList](#) questions print every odd node first followed by even node without changing the [LinkedList](#).

#### Round 3 (coding):

- Generic questions on project they are doing, how market values are there, what products are coming
- Count the occurrence of pattern 011110 in a large binary file.
- Questions on semaphores and mutex
- Questions on Call back functions
- Questions on function pointers
- Program to Reverse a single linked list
- Program to Detect loop in a single linked list
- Priorities of OS programs, process and thread differences
- How to handle the Generic functions, like Void pointers
- Similar coding question level order spiral form.

- Find the Next Permutation number.
- Retrieve the max 6 file in a folder who's size greater than 1MB.

#### **Round 4:**

- Write a own program for strstr function, optimal way
- Write a program to convert a given single Linked list to BST
- Questions on macros  
How do you want to see yourself after a year, your intentions, aspirations  
Big & Little endian – definitions, representations, write it down, swap them, etc
- Lots of memory related questions
- Write a program to implement memcpy() on your own
- Need to evaluate many other conditions like overlap situations and etc.,
- Difference between library call and a system call
- Priority inversion in a RTOS and its solutions

#### **Round 5 (Manager):**

Qualcomm aspirations, culture and how you look to be next, feedback from us on the interview, Nothing much... just a casual talk.

#### **Round 5 (Hr):**

Why Qualcomm? Relocation? salary expectation? just a casual talk.

Note: All rounds, you need to explain about your project clearly and they can ask some really good questions from your project. Be out and out clear with your projects and CV.

After this, I was actually into my Dream Company and Happy..!!

I suggest that always listen carefully to an interviewer, they'll definitely help if you have any doubt. Tell them your approach at least if you are not able to code it. Practice writing code on paper. For Qualcomm [Arrays](#), [Linked Lists](#), [Strings](#) and [Trees](#) are concepts which are very generally asked. Data structures & algorithms, OS should be proficiently practiced.

I would sincerely Thank [GeeksforGeeks](#) very helpful in my preparation and hope this would be useful for other aspirants.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Qualcomm

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## **Qualcomm Interview Experience | Set 7 (On-Campus)**

#### **Round 1:**

The first round was aptitude test along with basic c,c++,OS questions.

There was negative marking.

Overall it was easy.

#### **Interview:**

There were 2 technical interviews and 1 HR interview.

#### **TI :**

The interview started with "Introduce yourself" followed by "what do you know about Qualcomm?" Then he gone through my resume and started asking questions on each coursework. Since I am from Visual Information Processing and Embedded Systems background they asked some basic questions like:

What are the different types of image transforms? Why they are required ? What is DCT ? Why DCT is used for compression? What is the need of compression ?

What are the different resolutions available for video files ? What is the need of video compression? Architecture of video encoder/decoder ?

What are the different storage classes available in C ? what is static variable ? Where you can use it ? What is the difference between pointer and reference ? Write a code to swap two numbers ? Write a code to find prime numbers in given range?

What is the difference between semaphore and mutex ? What is spinlock ? What is thread ? What is paging ? What is virtual memory ? Can we have an infinite amount of virtual memory ?

This followed by detailed discussion of each project and internship. Since my project was in Device to device communication and Qualcomm works in that area the rest of the interview was centered around my project only.

#### **HR:**

Why Qualcomm ? What is your M Tech project ?

What are your weaknesses ? Hobbies ? Any higher education plans ? Family background ?

Along with all skill sets they look for good CGPA as well.

Overall it was good experience.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Qualcomm

### Qualcomm Interview Experience | Set 6 (On-Campus)

#### Panel 1

1. Tell me about yourself.
2. How many interviews did you attend?
3. Reasons for your rejection in the interviews?
4. How did you deal with those rejections?
5. Swapping two numbers without the third variable.
6. Deleting a node in binary tree?
7. Draw the block diagram of a computer and explain?
8. Process states in OS?

#### Panel 2/HR

1. Tell me about yourself?
2. Strengths and weaknesses.
3. About my project.
4. Which location I preferred?
5. About my family ?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Qualcomm

### Qualcomm Interview Experience | Set 5(On-Campus for Software profile)

#### Round 1:

The first round was hosted on hirepro.in and consisted of 3 sections:

Aptitude : 20 questions, 20 minutes

I managed to do only about 10. Time is the key here.

Programming 20 questions, 25 minutes

basic questions based on output, functional programming, bit manipulation

Did 18/20

Elective: (Electronics/Communication/Software)

I chose Software. 20 questions, 30 minutes based on OS, networking and OOP concepts.

Did 16/20.

The questions had a negative marking of 0.25.

9 students were shortlisted out of 200 for the next round.

#### Round 2: Technical Interview

Interviewer began by asking me 'What do you know about Qualcomm' and then moved to on some general questions like:

- Difference between CDMA and GSM technologies
  - Why CDMA was phased out
  - What is 3G LTE
  - How IoT can impact the communications industry.
- (They expect you to know about their company thoroughly.)

This was followed by a thorough scan of my resume. Each and every project and internship was discussed in detail. For my project concerning Machine Learning, I was asked how about partitioning of dataset, choice of performance metric, RandomisedSearch versus GridSearch.

Even the accomplishments on my resume were scrutinised. How I approached bug finding on site, difference between self XSS and reflected XSS, how do you suspect HPP.

So, basically if there is something on your resume, you should be aware of it in and out.

After this, he came on to coding problems.

Flatten a tree into a linked list

Some conceptual questions on pointers such as differences between int const \*ptr and int \* const ptr

The interview concluded with which team would you like to join at Qualcomm.

Overall, it was a nice and friendly experience.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Qualcomm

### Qualcomm Interview Experience | Set 5(For Experienced)

I recently got a call from Qualcomm Hyderabad for Engineer position. I am from CS background and had 1 year experience.

There are #3 Tech Rounds and #1 Hr round.

Round 1:

1. Discussion about my last company, what they do and what is my role.
2. Interviewer started with my resume and asked about my projects. One of the project is related to C so he asked me to code a small module in that.
3. Memory layout of the C program, Heap & stack allocation. Malloc & calloc differences. storage classes in C.
4. Fibonacci with recursion and its time complexity derivation.
5. Operating system synchronization mechanism, mutex vs semaphores, monitors.

Round 2:

1. Bit manipulation questions, Little and Big endian conversions.
2. Questions on compiler design, they want me to tell the steps and what happens in each step inshort like preprocessor, compiler, assembler, linker, loader etc. In which stage error will be thrown and how it throw the error.
3. Design a system which accepts a number divisible by 5. Hint finite automata state diagram for mod 5
4. Many questions on static variable and static function and difference between static vs global vs extern.
5. Reading a paragraph from a file and print the palindromes.

Round 3:

1. Discussion about my last company, what they do, what is my role, why I want to change.
2. Discussion about my projects. And the toughest module among all the projects I have done, why it is tough, what are the different approaches I tried.
3. write a program to find the number in a sorted array. constraints: you don't know the size of the array and you should try without finding the array size.  
(Hint: Use exceptions).

I have done using array out of bound exception and later optimized using binary search.

4. Oops concepts, Static and dynamic polymorphism, Vtable, Vptr.
5. Questions on Inheritance, upcasting and downcasting.
6. Cache mechanism in computer architecture, L1 and L2.

Round 4: (HR)

1. why I want to change the company?
2. why I want to join Qualcomm?
3. He explained about the work culture and about qualcomm.
4. What are my strengths and weakness.

HR round is really cool, we had this round by having coffee in Cafeteria.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
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### Qualcomm Interview Experience | Set 4 (Intern + Full Time Employee)

Round 1

- 60 aptitude questions – I attempted around 48 (since negative marks were there...i didn't attend those for which i had no idea)....and got through this round.

Round 2 (Technical )

- Introduction – about myself, educational background, project works, etc.
- Project – in and out; I was explaining and while explaining if the interviewer had some doubt or clarification; he asked and i answered; and so it was more of a conversation. Later he asked me few data structure questions.
- He asked me to write a program to reverse a linked list. Before i started writing it; he asked me if i knew it, i told yes; so he asked me to explain it without writing it....I explained him with my hands visually and very clearly(guess i impressed him atleast a little with this)
- Next, he asked me to write a working program for all operations in a stack and also asked, What is a stack, its use, etc? (gave a simple definition, its applications and the principle on which it works). I did this all pretty well.

Again as usual, when given the chance to ask questions; asked him lots of questions and made sure that i stand out from others.

The interview duration was approx 1.5 hours if am right, which was the longest comparing to others in the same panel. Later was through to HR Round directly after this round.

#### HR Round

- It was again with lots of simple questions and what i would do in various scenarios; and was again given a chance to ask questions; i made sure i make full use of the opportunity and asked around 5-7 questions. (PROPER QUESTIONS about the company...). And i had completed a course in ENGLISH in coursera, and also was school first in English in CLASS XII; so by seeing these two the HR asked me why i did that course? (considering my english wasn't very bad...maybe it could be better on the vocabulary part, but who cares...?)

I told her that i did that course because i wanted to improve my English speaking and writing skills in a professional way; and also told that around 200 students scored the same mark as me in English in CLASS XII, though it was the first mark....(She laughed and told Okay)

- For every answer i gave some clarity to it...and when i told something negative about myself or something...i backed it up by giving some valid reason for the same...

For ex: My weakness was I forget things; I told her i'll overcome this by making use of reminders, alarms, and by taking notes as and when things are told....so that i don't forget things easily....

This time I was lucky enough to have got placed in QUALCOMM with FTE + INTERNSHIP OFFER.

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## GATE CS Corner Company Wise Coding Practice

Internship  
Interview Experiences  
Qualcomm

### Qualcomm Interview Experience | Set 3 (Bluetooth Engineer)

- 1) Storage class
- 2) register qualifier
- 3) Const int \*p and cont \*int p;
- 4) Reverse a link list
- 5) Program to generate a packet(specifications were mentioned, some method were given as clue
- 6) program which can overflow a stack
- 7) Project related questions snad cross questions
- 8) Program to swap the pointers such that- char \*p = "hyderabad" and char q[20] = "banglore", start pointing in way p =banglore and q = hyderabad

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Qualcomm

### [TopTalent.in] Interview with Rishav who got a job offer from one of the core companies, Qualcomm



Engineers from core branches like Electronics, Mechanical, Chemical today are often found chasing lucrative employment in fields like IT and analytics, areas unrelated to what they spent four grueling years studying. But Rishav Rej of BITS Pilani, Hyderabad Campus decided to take the road less traveled by. Armed with an impressive resume that included plenty of experience and projects in his core branch, ECE, Rishav earned a place with one of the world's leading semiconductor and telecommunications company, Qualcomm. TopTalent.in brings you his opinions and advice about dealing with interviews.

**TopTalent:** How does it feel to be selected by Qualcomm?

**Rishav:** Great! I was always interested in Communication Engineering. Making it to one of the leading companies in MODEM technology, it really feels special.

**TopTalent:** Can you describe the complete hiring process of Qualcomm?

**Rishav:** Qualcomm had come in the first semester to hire fresh grads and recruit summer interns as well. Firstly, there was an online test and the shortlisted candidates were called for interviews. There were two rounds of interviews, one for technical and the other HR. Five of us were selected for the internship program of 10 weeks. During this interning tenure we were evaluated and our performance reviews were submitted. We also had to go through an Exit Interview. Combining both these components they selected 4 out of those 5 interns as new hires.

**TopTalent:** What was the toughest question you encountered and how did you answer it?

**Rishav:** ‘Tell us about yourself’ was definitely one of them. This was the one question which I was certain would make all the difference as technically all my fellow candidates were very competitive. I took the opportunity of answering this question by telling the interviewer about my projects, internships and my interest in the field of wireless sensor networks, a field that works in close lines to Qualcomm’s R&D. And the rest of the interview went smoothly.

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

**Rishav:** I wasn’t prepared actually on the day of my interview, but I was confident about what I know. So that confidence did help me through. During the internship period sincerity and dedication did the trick for me. Previous experience in the form of internships and projects can also come very handy. I had worked in the Engineering Section of Moser Baer India, MODEM-Automation Team of Qualcomm and in Research and Development for Tejas Networks. Also, I had done projects in the fields of Data Acquisition through Wireless Sensor Networks, Data Indexing in Wireless Sensor Networking and Optical Networking in Fiber Optics during my four years in college.

**TopTalent:** Can you talk about what resources you referred to before the interviews?

**Rishav:** I mostly referred to my class notes and went through the few technologies Qualcomm was working on. Basically I brushed up on concepts.

**TopTalent:** What were some important factors according to you that made you stand out?

**Rishav:** I cannot say that for myself, but one thing which I always ensured was to carry myself in a confident manner. I kept repeating to myself, ‘There is nothing to be afraid of or nervous about’. I think the most crucial point is to be able to handle any situation well under pressure. I tried to constantly remain calm and I think that might have turned things to my favour.

**TopTalent:** Currently, what are you working on and how has the experience been so far?

**Rishav:** It’s the third day since I’ve joined Qualcomm and been allotted my team. The general atmosphere and ambience here is awesome, everything that I had hoped it would be. Also, my peers here are the friends I had made during the internship, who joined the company along with me. Coming to my work, it is in CDMA, something which has always interested me. So far, it’s been a perfect combination of work and fun. At present I am just taking my time to settle down and am definitely looking forward to a great experience ahead.

**TopTalent:** What is your advice to students who are aiming for similar placement offers?

**Rishav:** Be very clear about what kind of work you want to do. Remind yourself of your aim and always keep it in your mind. If you have clearly defined goals, you will be able to ensure that your preparation is organized and up to the mark. This will also give you the confidence to crack the toughest of interviews.

You can [login and download](#) Rishav’s resume from [TopTalent.in](#)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Qualcomm

### Qualcomm Interview | Set 2

It was a very good experience to face interview at Qualcomm.

I have attended the interview for a position of Embedded SW application developer and my experience and my expertise is on C/RTOS/Data structures in telecom domain.

**Process:** 1 Telephonic, 5 Technical, 1 HR round (each of 40min to 1 hr).

All rounds were not that much tough and interviewers were very friendly in talking.

#### Telephonic:

- All about your CV
- Lots of questions on project and how it works actually
- OS concepts and real examples
- Deadlock situations (detection ,prevention)
- Sw watchdog timers
- OS schedulers and algos
- Error handling in the system , Core dumps ,etc
- Memory management concepts
- IPC communications
- Mutex/critical section/semaphores

Note: All questions were asked deeply and need to tell him until he convinced with the answers.

After 2 days I got a call to come down to Qcom office for next rounds. That day went long..!!

#### Round 1:

- Basics of C programming
- Memory map of program, Storage classes and their mapping
- If we declare more number of variables than the registers available on the processor? Where they will be stored.
- IPC (signal, as I coded in this) how actually it does transfer of memory

Set of C code snippets given to debug ... Identify problems in it and tell outputs

And further questions on that.. like why ?

#### Round 2:

- Basic C questions
- Write a program to Delete a node , given only a pointer to the node in a Circular linked list
- How to access data in the called functions after returning from it (point here is that, cannot access auto variables in functions after it is being called off )
- Write a program to return a stream of bytes from a function
- Lots of questions on Function pointers, how, usage, examples

#### Round 3:

- Generic questions on project they are doing , how market values are there , what products are coming
- Memory handling in SIM cards/embedded applications
- Priorities of OS programs , process and thread differences
- How to handle the Generic functions , like Void pointers

#### Round 4:

- Write a own program for strstr function, optimal way
- Write a program to convert a given single Linked list to BST
- How a software development happens and what you do if you were given a product to develop
- Project questions
- How do you want to see yourself after a year, your intentions, aspirations

#### Round 5:

- Big & Little endian – definitions, representations, write it down, swap them, etc
- Lots of memory related questions
- Write a program to implement memcpy() on your own –
- Need to evaluate many other conditions like overlap situations and etc..,
- Difference between library call and a system call
- Priority inversion in a RTOS and its solutions

#### Round 6 (HR):

- Qualcomm aspirations, culture and how you look to be next, feedback from us on the interview, Nothing much... just a casual talk.

Note: All rounds, you need to explain about your project clearly and they can ask some really good questions from project. Be out and out clear with your projects and CV.

All interviewers will explain about the position you have applied for and it is good if you ask more questions on what exactly they do and how it works.

*I did these interviews very good but unfortunately I was not into the Qualcomm after this. But they considered for another position and within a month I got another call and again 3 rounds of Technical Interviews as below,*

**Process:** 3 Technical

#### Round 1:

- Network Traffic measurements
- Udp vs tcp, diff
- Os schedulers
- Timer module code // you need to write code for the timer module which actually handles timeout functionality for all clients and execute handlers of client at timeout. (things they looked for are how you design a given problem, callback functions, function pointers,etc)
- Questions on Call back functions
- Questions on function pointers
- Program to Reverse a single linked list
- Program to Detect loop in a single linked list
- Detect errors in pgm below

```
int main(void)
{
    char *p;
    while(i<50)
        p++;
    return p;
}
```

#### Round 2:

- Project details deeply
- Ipc , os schedulers
- Prioritized processes, weighted round robin
- sw wdog
- Memory management
- Mem leaks & corresponding tools
- Buffer overflows and impacts/problems from that
- Deadlock, methods to avoid, prevent, etc

- Semaphore, mutex, busy wait
- code for memcpy and problems, covering all error scenarios.

#### Round 3:

- Stack corruption
- Hacking through stack smashing
- Program debug
- Priority Inversion,ex
- Race conditions,ex
- Semaphore, mutex, ex
- Strcmp, pgm,ff ends it
- Arbit linked list pgm
- Memcpy pgm, possibilities like overlapped memory address copy.
- Small general DI puzzle
- Pointer subtraction

After this I was actually into my Dream Company and Happy..!!

I would sincerely Thank GeeksforGeeks very helpful in my preparation and hope this would be useful for other aspirants.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Qualcomm

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## Qualcomm Interview | Set 1

Company : Qualcomm  
Position: Summer Intern(Software)

### Written Test

It was an online MCQ test. Time limit was one hour. There were around 55 question. It consists of three sections:

1) Aptitude Questions

Pretty simple.

2) Programming ability :

Patience is required to solve the questions. They were easy. Most of them had 3 to 4 nested loops.

3) Third section had questions from OS, CA, C++, DBMS. Most of them were from OS.

### Technical PI (around 1.5 hr):

There was only one Technical Round

1) He asked me about my projects and made me write the pseudo code and flow chart for two projects. He wanted the perfect flow charts with the correct symbols used.

2) Priority Inversion (what, where and why)

3) Volatile Qualifier

4) Difference between static and global variable storage class

5) Questions on Storage classes

6) Toggle only second bit of a 8 bit char(both from right and left). Write one line code.

7) Coupling in C++ and Cohesion. Required combination(low/high).

8) All OOP concepts in C++. How they are implemented in C++.

9) How will you make a computer.( explanation of the components of computer).

10) Operating System uses(detailed explanation.)

11) How Application Software uses OS.

12) Drivers

13) CPU scheduling algorithms (one of my projects was on this). What and where each one of them should and shouldn't be used. Advantages and disadvantages, if priority is considered in each one of them. If already considered how it is affecting.

14) Binary and Linear search.

15) Three switch puzzle.

16) Merge Sort and Quick Sort.

17) How will you improve any of your algorithm:discussed on space and time complexities.

This all I remember.

**HR Round (30 minutes):**

- 1) Introduction
- 2) She asked me about my projects, how you can enhance them, how they are useful to me.
- 3) Weakness, anything interesting thing about you that you can tell me.Examples for them.
- 4) Some points which you remember from the presentation.
- 5) Why Qualcomm, why you for Qualcomm?
- 6) What do you like more while working in a project , conceptualizing e.t.c and why?
- 7) Do you have any problem going out of station?

Selected.

This article is compiled by **Tapasweni Pathak**. Many Many congratulations to Tapasweni. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Qualcomm

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## Dell Interview Experience | Set 4 (On-Campus)

Dell recently did an on-campus hiring at my University.

The 1st round was the Aptitude test which was conducted online. It had 15 questions from quantitative which were pretty difficult to solve. 10 question were from English which were quite easy. 20 questions were from Computer Science and C++ programming which required in depth knowledge of the concepts of OS, Computer Networks and DS.

30 students were shortlisted out of 180, on the basis of this round.

Next round was the Technical Interview. The interviewer made me comfortable, and I could talk to him freely and frankly. I was asked questions on my projects and Internships and a coding question on putting the items in different arrays based on their colors. The interviewer appreciated me a lot and told me my plus points in the end, and (as it appeared) was happy with how the interview went.

I was then shortlisted for HR, where I was interviewed for about 3-4 minutes, which was same for all the candidates. The HR as told to us had joined dell 1 month ago. 10 students were shortlisted out of 30, where 4 were girls and 6 were boys, Similarly, out of these 10, 5 were from ECE and 5 were from CSE.

Clearly, the company preferred ratio over talent which I personally would not want my future company to follow.

TIPS :

- 1) The interview will be easy, just be confident.
- 2) Follow the Pre Placement Talk, some questions in HR can be from them.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Dell

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## Dell Interview Experience | Set 3 (On-Campus for Dell International R&D)

Interview experience for Dell International (R&D) – On Campus Software Development Associate Engineer (II)

Selection Procedure :

- 1 MCQ Test
- 2 Technical Rounds
- 1 HR Round

Note: Each round was an elimination round

**Written Test :**

- 50 MCQ to be solved in 75 min
- Difficulty level was similar to GATE questions
- Questions were from C/C++ programs, Networks, Operating System, DBMS, S/W Engg, General Aptitude etc.

**Round I (Technical – F2F) :**

- All the interviews were 2 on 1 (2 interviewers)
- Interview began with discussion on current project and questions based on that.
- Then interviewer asked me questions based on my network related project.

- He asked questions about OSI layer, working of switches and router.
- Routing protocols, working of OSPF, how routing table gets updated step by step, Spanning tree protocol etc.
- Implementation of Dijkstra's Algorithm.
- Code for reversing a linked list
- Problem Solving
  - You are given a random no. generator, it is generating random numbers continuously.
  - Another application consumer is given, which is taking random no. as input but the frequency of consumption of no. is not fixed suppose consumer at some time may access 0 or 1 or n no. generated, constraint is that no. consumed by consumer should be last generated maximum no.

ex:

```
generator = 2, 150, 20, 100, 200, 1000, 1080
for n=2
consumer = 1080, 1000
for n=4
consumer = 1080, 1000, 200, 150
```

- Basic questions related to data structures (heaps, stacks etc).

#### **Round II (HR – F2F) :**

- Introduction
- Discussion based on project
- Android related questions (as one of my project was in android)
- CV based questions
- Why dell?
- Some situational questions

#### **Round III (Technical – F2F) :**

- This round was based on Operating System questions
- What is kernel?
- What is system calls, how they are executed?
- Questions based on process synchronization, mutex, semaphores (binary and counting)
- Linux file system, inode
- Virtual memory, addressing, paging, segmentation, fragmentation
- Page fault, thrashing
- Busy wait, spin lock, deadlocks etc.
- Process schedulers, dispatcher

I would like to thank G4G for such great forum, surely G4G is the best source for preparation.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Dell

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## **Dell Interview Experience | Set 2 (On-Campus for Dell International R&D)**

The Interview Experience below is for Dell International mainly to Dell R&D division. The hire process was mainly focussed on their Server and Storage systems requirement.

This was a On-campus hiring event.

#### **Hiring Procedure:**

There was one written test, 1 to 3 technical interviews and a HR round.

#### **Written test:**

- It had basic questions of Quantitative Aptitude, Analytical Aptitude some of Operating Systems, Computer Networks, Database and very few questions on current new technologies.
- there were 50 questions to be answered in 60 mins.
- Half the questions were from aptitude and other from the core Computer Science.
- Each section had a separate cut off.
- Guarantee yourself that you do well in this test as the calls to interview are based on these scores and they call you according to the score you get. You score high marks you are called first to the interview and preference in selection to you will be high.

#### **1st technical Interview:**

- I was 10th one to be called for interview.
- I was asked difference in static, global variable. What's the use of dynamic memory allocation over static. They went little deep.
- They also concentrated more on projects implemented earlier, they were really keen on your implementation details and logic applied. They questioned me every logic I told as to why this why not that.
- Working code to be written for finding the highest frequency number in an unsorted dataset of 0's and 1's (00001010100011111100).
- Sort an array of 0's 1's 2's (0010200111222200001111).
- They also asked some Linux commands and Operating system concepts like system call, forking in Linux.

Some people also had their 2nd technical also but I was taken to HR round.

Questions were very basic/routine in HR round.

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Interview Experiences  
Dell

### DELL Interview | Set 1 (On-Campus)

Pattern : written + 2TECH + 1 HR(But for me 1Tech + 2HR)

Type : Online

Cgpa criteria : NO

Written Exam Modules : 60 questions 70 min (no -ve marking) Aptitude questions were time taking, OS, Data structure, Database and Computer Networks

#### Tips:

Try to read gate material from geeksforgeeks. many of the questions and concepts are from it.

"Be individual and solve them"

#### Shortlisting Information :

If you can answer at least 40 questions, you'll get shortlisted. They shortlisted 15 candidates for interviews and also they called 8-10 waiting list candidates for interviews.

#### My Interview Experience:

##### Round 1 : (35 min)

1. code of Inorder recursive and non recursive
2. Questions on sorting like best algorithm if u consider (no. of swaps, no. of comparisons etc)
3. Sorting words in a large file.
4. T9 Dictionary(most important question of many companies).
5. Insertion sort code (they look for each every corner cases,so better check ur code with all types of test cases and then ask the interviewer to review it )
6. course projects.

Then he asked to wait for second round.

By that time, those guys(DELL interviewers) have decided to take only 10 members and they already have the count and they were calling the selected candidates and congratulating them and for my friend they have specified the field and under whom he would be working. As the count have been reached, those guys are not interested in me, they would like to take my interview just for formal. I understood the scenario and i should create an special impression about me to get selected and increase their count.

##### Round 2 : (30 min Tech + HR)

Interviewer was the best guy among the other interviewers i met till now. Awesome experience with him. I felt like I was speaking to my friend and some times we were cracking jokes on each other.

Basic HR questions

1. Tell me about yourself
2. +ve's and -ve's
3. Explanation of Course Projects(discussion oriented went for 20 min)
4. Show me an example that you are good at team work.
5. course projects
6. Finally he asked me to say about DELL as much as i know?

But really speaking, I don't know anything more about the company information.But i said only one sentence  
"DELL, The main weapon of most of the Computer Science students over here and every where."

By that one sentence he was impressed more and he gave me one best complement.

"You have good narrating and management skills. You can be recruited into HR management and can come to you campus again next year to recruit your juniors". It was an awesome feeling when he said that sentence.

##### Round 3: (5 min)

I said that I was placed in INTEL and want to join INTEL. He said he was impressed with my frankness and ended the interview over there.

Source: <http://amarnath-iitd-placement-experience.blogspot.in/2013/12/dell-interview-experience-2013.html>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Dell  
Interview Experience

### Oracle Interview Experience | Set 42 (OFSS for Associate Consultant)

Oracle Financial Services Software(OFSS) visited our campus for Associate Consultant profile.

*There were 3 rounds:*

**1) Online Test**

There were questions related to:

- Aptitude
- Computer science subjects like OS, DBMS, OOPs, DS.
- Output questions on AVL, BST, C++.
- Flow chart problems.
- Reading Comprehensions and some basic grammar questions.

This round was easy, but lengthy.

Questions were average, so manage time accordingly.

**2) Technical Interview**

- Tell me about yourself.
- What is process in OS?
- Difference between Java and C++.
- Multi-threading in Java?
- What is object-oriented programming?
- What is Linked list?
- Difference between Union and Join.
- Asked me to write a Query, given two tables.. (don't remember the exact scenario but query involves using join operation).
- What is SDLC? Explain it.
- Project Discussion.
- Asked me to explain my project again through SDLC phases(mostly discussion on the requirement gathering phase).
- What is a function?
- What is testing?
- What is unit testing?
- How you have done testing in your project?

**3) HR interview**

- Tell me about yourself?
- What attracts you most towards IT?
- What are your strengths and weaknesses?
- What problems you have faced so far in your life and how you have tackled them?
- Why Oracle?
- How long you are planning to work with us?
- How you see yourself after 5 years?
- Any questions you have?

Some questions i asked were location preference, joining date and many other doubts.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 42 ( 2 Years Experienced )

Oracle 2 years Experienced Hyderabad location. There were 3 tech round and 1 director round.

**Round 1**

- 1: If there is sudden cut off in power and you have to save the clients important data from a web browser, so that it can be recovered , how would you do that?
- 2: Difference between Object,Class,Reference with example.
- 3: what is singleton class design your own.
- 4: You have records of employee name and salary.You have to sort the records on the basis of employee salary,if same then by employee name.

**Round 2**

- 1: You have three types of details distance between two cities ,road condition between two cities and traffic details between two cities. Priority of traffic>distance>road condition.

You will be given source and destination, write a code to find the best path.

- 2: you have 2 methods isDirectory and isFile,code to count total number of files.

Then count size of top 10 files, then is it possible to find top 10 files without scanning all the directories.

**Round 3**

- 1: Project Discussion.
- 2: Convert sorted array to balanced binary search tree.
- 3: Given array of characters shuffle it so that no similar character are beside to each other.
- 4: 25 horses puzzle.

**Round 4**

- 1: why you are switching your current job?
- 2: Why Oracle?

3: State any two unique ideas on which we can build a mobile app.

4: CTC discussion.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Oracle

### Oracle Interview Experience | Set 41 ( On Campus )

**ROUND 1: Aptitude**

**ROUND 2: (ONLINE CODING)**

1. Write a program to identify the first repeating integer in an array.
2. Greedy approach based questions.

**ROUND 3: (TECHNICAL ROUND)**

1. Explained the project and was asked to draw a database design for my project and also to normalize them and various queries regarding the design.
2. Write a code to count the maximum number of bugs that can be placed in a M\*N matrix in a minesweeper game provided we cannot keep the bugs in the cells surrounding a bug. EX:

**ROUND 4:**This is just one possible combinations. Try all the possible combinations and find the maximum count.

1. What is the meaning of your name ?
2. What kind of books you read?
3. Who is your inspiration and why ?
4. What is your father and mother doing?
5. Write a program to find the mirror image of a tree.
6. Write a program to find all the pairs of numbers between 1 and 1000 that satisfy the following condition If the sum of divisors of A is B then sum of divisors of B is A.
7. Ant puzzle problem. In a triangle three ants lie at each corner. If the ants move along the edges of a triangle. What is the probability that they do not collide each other.
8. If a fruit seller has initially 2000kg of watermelons in the morning out of which 99% is water. In the evening the watermelons shrink and the total water content is 98%. If none of the fruits are sold find the total weight of fruits.
9. Who will win the game ?X or O

O                    O  
O                    X  
X                    X

10. Given 12 words each of three letters. If I tell you a single letter of my secret word then you can say the total number of vowels in my secret word. What is my secret word?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 40 ( FSS Application Developer )

**Technical round**

1. Difference between c and c++
2. Oops concepts (questions related to polymorphism, abstraction, inheritance). Write a code to show these things.
3. What is **recursion**? Internal structure of recursion
4. Questions on **trees, stacks, queues**. Code to find lca of a tree using recursion
5. code in plsql(sum of 2 numbers)
6. questions on dbms(normalization, forms of normalization, how to normalize a table).
7. he gave me two tables and asked me to normalize it. And then asked me to write a sql code with some conditions(i had to use inner join)
8. discussion on my project for 15-20 mins.(if you know everything about that project then mention it in your cv else not)

**Normal question on technical round**

9. why oracle? My answer was."It is a great platform to start our career... opportunity to learn new things
10. being an etce engineer , how can you help oracle?

11. Tell something about oracle

#### Hr round

1. Three strengths(i had to give real life situation)
2. Why oracle fss?
3. Three weakness
4. And many normal hr questions.

#### Tips

Be honest, don't say "i don't know" to any question, try to approach it and always ask question after the interview if he tells you to ask a question.

Most important thing is before going to the interview get enough idea about the company

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 39 (Application Developer )

Oracle visited our campus to recruit students for the post of **Applications Development Engineer**.

### Round-1 (Online Test)

This test comprised of questions broadly from four categories: Verbal, Mathematical Aptitude, Software Engineering (flowcharts etc.) and Computer Science Concepts (DS, DBMS, OS etc.).

Out of around 300 students, 50 were shortlisted for the PI rounds.

### Round-2 (Face-to-face Technical Interview, lasted for 20 minutes)

- The interviewer asked me to introduce myself
- Asked about my projects and internships in detail (also asked a lot about my final year project that I was doing)
- Program to reverse and print a string that was accepted as an input from the user
- Asked to describe the KMP algorithm
- Asked a few SQL queries (creating a table, view etc.)
- Difference between DDL and DML with examples
- Basic OOP Concepts (Data abstraction, Inheritance etc.) with relevant code snippets
- Puzzle: <http://www.techinterviewpuzzles.com/2010/04/four-people-on-rickety-bridge.html>

### Round-3 (Face-to-face Technical Interview, lasted for 2.5 hours)

- Detailed discussion on projects and internships
- Asked to tell me some problem that I enjoyed solving the most when I began coding and to write the code for it. He also asked me what was the problem I faced while solving that problem initially and how had I overcome the same. I told him the following problem: <http://www.geeksforgeeks.org/print-a-given-matrix-in-spiral-form/>
- Asked me my favorite course, to which I replied Data Structures. Then he asked me to list down all the data structures I know, each supported by an example of its utility.
- Then he asked me my favorite Data Structure (I said it was Stack). He asked me to tell how certain features of word processors (like MS Word) and browsers use stack. (To this I said that MS Word could use the concept of stack in Redo and Undo options (and also in Clipboard), while the browsers might use it in the Back and Forward buttons)
- Next, he asked me to write a working code for the usage of stack in browsers for the feature I described above
- Asked to write a working code for converting a number from digit-form to words (for example 1192 would be called One Thousand One Hundred and Ninety Two) using OOP.
- Puzzle: Three persons A, B and C are standing at the vertices of an equilateral triangle inscribed inside the circle. When the bell goes, all three start running on the track at the same speeds in directions we don't know. What is the probability that none of them will collide?
- Puzzle: <http://www.programmerinterview.com/index.php/puzzles/25-horses-3-fastest-5-races-puzzle/>

### Round-4 (Face-to-face Technical Interview, lasted for 20 minutes)

- Discussion on projects, again!
- Asked about Normalization and the Normal Forms (with examples)
- Asked to design a DBMS for an e-commerce system along with relevant ER diagrams and data structures
- Asked a bit more about myself and my hobbies

### Round-5 (Face-to-face HR Interview, lasted for 20 minutes)

- The customary "Tell me about yourself" question
- What do you like most about Oracle's website?
- Discussion on projects and co-curriculars mentioned in the CV
- What is that one thing you would want to change about yourself? Why?
- What do you like the most about yourself? Why? Give an example from your past.

- Would you want to pursue higher education? Why not?
- Asked about my location preference and asked me to wait outside for the results

**Fortunately, I was selected along with five other people. Thanks to GeeksforGeeks!**

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

# Oracle Interview Experience | Set 38

There were 4 rounds in total

### Round 1:

- Online MCQ
- 1) Quant
  - 2) DS and Algo Concepts
  - 3) DBMS and general Computer Science
  - 4) English

(Test was common for both OFSS and Oracle Apps.)

### Technical 1:

- 1) Tell be about yourself?
- 2) Questions related to project work.
- 3) 2 simple codes on arrays and strings.
- 4) Questions on JAVA.
- 5) 1 SQL query (delete duplicate elements without using aggregate function)
- 6) 25 horses puzzle.
- 7) Why not higher studies?

[40 mins]

### Technical 2:

- 1) Write a list of all data structures and explain each of them along with their applications.
- 2) Implement queue using stack.
- 3) Implement stack using queue and optimize push and pop of both.
- 4) Questions on Time complexity of various algorithms
- 5) Where is stack/queue used in web browser? Write full code explaining the same. (Ans: stack is used in back and forward button)
- 6) Random questions on OOPs and DBMS.

[1 hr+]

### Technical 3:

- 1) A detailed discussion about project.
- 2) There is a login page. Write a code to encrypt and decrypt the password using some logic (Caesar cipher being too simple, I gave the approach to represent them in binary format)
- 3) A Pattern matching question (KMP algorithm)
- 4) Questions on normalization.
- 5) Where do you want to be after 5 years?

[35 mins]

The next round was HR. I was not selected for HR. Those who got into HR also got the job offer Be confident. Good communication skill is of prime importance. The approach is more important than the perfect solution.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

# Oracle Interview Experience | Set 37 (Application Developer )

Oracle Ltd. recently visited our campus for the role of application developer. There were a total of 5 rounds (online test+3 tech interviews+ hr interview).

Online test was conducted on their own platform . It had 4 sections:-

- verbal
- aptitude
- programming skills (flowcharts etc..)
- computer science concepts (DBMS , OS , questions on trees )

The level of the questions were above average.

Out of around 70 students , 40 were shortlisted for the personal interviews.

#### 1.Techinal Interview(F2F):-

- What is the difference between class and structure ?
- Why use class when we have structure?
- What are the differences between c and java?
- What is the feature that makes java platform independent?
- Detailed description(steps) of how a java code is converted into machine code.
- 3 coding questions (complete code was expected)

There are sequence of words and the limit on the number of characters that can be put in a line is given as 80. write a code in a such a way that the given sequence of words are properly partitioned (after 80 characters

in a line , a new line has to be started ) condition:- no word has to be split (partial placing of a single word in 2 adjacent lines is not allowed).

**Example:-** if the sequence is "hi iam abc iam from xyz" and the limit=7, then the output should be:-

hi iam (7 characters last character is space)

abc iam(7 characters)

from (had to split xyz entirely to the next line because "from xyz" crosses the limit 7

xyz.

– Modified Minimum cost path in a matrix (dynamic programming question).There is a matrix with positive and negative integers and few cells with "X" characters through which the path cannot be taken.

\*Code to find the minimum cost from (0,0) to (m,n).

\*Code for the actual path from (0,0) to (m,n) through which the cost is minimised (optimised solution was expected).

-There are a sequence of characters like "ABBAAADDEEBBD"

\*sort them on the order of occurrences maintaining their order in the given string.

output :- AAAABBBBDDDEE

- Questions on internship project.

#### 2.Techinal Interview(F2F):-

- How much would you rate yourself in coding?
- 1 coding question (complete code expected)

There is a busstop where people have to form a queue . People forming the queue are numbered in the increasing order and are labelled with a character "E" or "B" where E says the person to stand at the end in

the queue and B says that he should go to the beginning . If in the queue any person with bigger number stands in front of any person having smaller number then the person with smaller number raises an

"unsatisfactory count" . For an input string count all such unsatisfactory counts of all the persons.

Example:- input string "BEEB".

output:-1110 , because 4th person has got the label 'B' so he stands in front of all the first 3 persons... so all the 3 persons raise a count for the 4th person standing in front of them.

- 1 Data base question

There is a car showroom which sells or rents cars of different models .A particular car model may have many number of cars (like there can be 20 maruti alto cars). A customer can buy a car or take it for rent if he

buys a car then total number of cars of that model has to be decremented by 1 but if a car is taken for rent the number should not be decremented.

\*Interviewer:- Now , considering all the cases and conditions design a data base for the system ( he intentionally did not mention any )

\*\*so i had shown 3 tables with all possible columns , an E-R diagram for the system , a sample J2EE servlet code and few possible sql queries)

#### 3.Techinal interview(F2F):-

- Write a recursive function for finding factorial ( all base cases were expected ) (this question was asked just to test my speed )
- Why is your cgpa decreasing ?
- What is your favourite subject? to which i replies mathematics
- If you have 5 0's and can choose any mathematical operator ... get 120 out of those 0's
- Discussed about work at oracle in detail.
- Questions on internship project.

#### 4.HR interview(F2F):

- Tell me about yourself.
- What are your strengths?
- What are the areas in which you think you have to develop?
- Give a location preference .
- Why did your cgpa drop so drastically in the fourth semester?
- What are your hobbies?

Finally , they selected 7 students .

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 36 (Application Developer for OFSS)

3 rounds:

1. Online Test
2. Technical Interview
3. HR interview

#### Online Test ::

There were four sections –

Code Snippets ( All the questions were from Trees...AVL (to be specific))

Aptitude

Verbal Ability

Technical (DBMS,OS,Flow Charts,DS)

There were sub-sections from each respective section.

Basics should be in order to crack it.

#### Technical interview ::

Give a brief intro of yours.

// Gone through my CV and my academic scorecards.

Explain your projects.

Which language are you comfortable in.

What is DBMS.

Normalisation and its types.

Explain NFs with examples.

Remove redundant records from a table by using a single query.

// Oracle language should be good enough

What are Joins. Types of joins.

A brief talk about procedural and object-oriented languages.

Very friendly interviewer.

#### HR interview ::

Tell me something about your childhood memories.

Hobbies.

How much you rate yourself in coding. Explain.

How, do you think you could be beneficial to Oracle.

Why should I hire you.

Willing to Relocate or not.

HR was very cool with answers and very friendly to interact with.

A big thanks to geeksforgeeks !! It helped me a lot.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 35 (On-campus)

Firstly, an online test was conducted on the Oracle platform, consisting of 4 sections – Communication Skills, Logical Aptitude, Programming Skills, and Computer Science Knowledge.

I found it challenging as the questions were of moderate level, time was limited for each section and some of the questions were related to the next ones in queue and you couldn't go back to the previous ones.

Around 50 students were shortlisted out of 200.

Further there were 4 rounds of face to face interviews.

#### 1. Technical Interview – 1 (30-40 minutes)

The interviewer went through my resume in detail and asked me about my projects. After a brief discussion about the projects he asked me about my favorite subjects to which I answered Data Structures and Algorithms. He then asked a few questions related:

- Given linked list, detect if there is a loop in it.

I gave the Floyd's Detection Algorithm. I wrote the code for it. However he wanted a dry run of the code with a few test cases and also the mathematical proof for it. I did as he asked and he was satisfied.

- Given a list of numbers. Sort it using your favorite sorting algorithm.I used Merge Sort. Wrote the code for it. He asked me why I used Merge Sort and not Quick Sort. I answered on the Basis of Complexities. He went further into the mechanism of Quick Sort and how the complexities change based on the selection of the pivot element.

## 2. Technical Interview – 2 (1.5 hours)

The interviewer went through my resume and this time he had an in depth discussion about one of my projects. My entire contribution to the project had to be explained to him and he asked me many questions regarding that. He also noticed my Web Development Internship and asked me basic questions from HTML, CSS. The questions he asked further:

- Tell me about Data Structures. Give a simple introduction about the topic. An overview about Data Structures was given by me. However he went further asking differences between each, advantages, disadvantages and practical use of each data structure.
- Given a deck of cards give me an algorithm to shuffle it. The algorithm should not result in the same set of shuffled cards each time.I gave many approaches. Generating a random number in a given range in a loop, a divide-conquer approach similar to merge sort but using a different merge technique. However he pointed out errors in all of my approaches. He gave a hint: Linked List. It then struck my mind and I answered it based on the Random Pointer Traversal in Linked List.
- Design certain functionalities of the game FIFA for the computer.He asked me to design Short Pass, Long Pass and Shooting. Code was not required but I had to write down the base conditions of each functionality and the algorithm on how they would work.
- The Puzzle of the 3 Hats.

## 3. Technical Interview – 3 (1 hour)

Interviewer went through my resume and started asking questions directly.

- Design Flipkart /Amazon Database. Like give an idea on how the database tables are organized.  
I had to write on paper about the tables. How they are linked. Common Attributes. Primary Key. Foreign Key. He further asked me to talk about the table for The User Cart in Flipkart/Amazon.
- Asked about Normalization forms related to the tables in the above question.
- What is De-Normalization? Why is it required?
- Tell me about the Software Development Cycle(SDLC)
- Give a detailed description of the Coding and Testing Phase.

## 4. Final Round HR

Interviewer asked me basic HR questions and this round was just a formality.

- Why Oracle?
- Do you want to do any higher studies?
- Something you like about yourself. Something you do not.
- A moment in your life where you felt you gave your best yet did not get the expected result.
- Where do you see yourself in 5 years?
- Location Preference.
- Any questions?

This round went on for 15 minutes.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 34 (On-campus for Application Developer)

Firstly, an online test was conducted on Oracle platform, consisting of 4 sections – Verbal, Aptitude, Programming Skills, Computer Science Concepts. There was separate time for each section, and each section contained subsections as well.

Shortlisted 40 out of 65 students for the interviews.

There were 4 rounds of interviews.

### 1. Technical Interview

\*Check whether a tree is balanced or not / Check for AVL tree. (Written Code)

\*What are collections in Java?

\*Implement a HashMap collection in Java.

\*Find the maximum continuous subarray sum of an unsorted array, consisting both positive and negative elements / Kadane's algorithm. (Written Code)

\*Puzzle: There is a worker, working for 7 days. You have a long piece of gold, of which you give 1/7th of the piece to the worker daily. Find the minimum number of cuts required to make in the gold piece, such that the worker gets his fair share each day.

### 2. Technical Interview

\*There is a bank, containing 'c' counters. There are 'n' people standing in a queue. The counters open at 9:00 A.M. There is also an array a[n] given, containing the time taken by every person to complete his/her query at the counter. Whenever one counter gets empty, the very next person in the queue goes to that particular empty counter. Find at what time the x'th person (x

3. Technical + HR Interview

- \*Do you have any questions?
- \*Why did your CGPA fall so drastically in the sixth semester?
- \*What is your favorite subject from CSE point-of-view and from non-CSE point-of-view?
- \*Some questions on my favorite subject from non-CSE point-of-view. (Geography :p)
- \*Given a linked list, check whether the linked list contains a loop. (Written Code)

#### 4. HR Interview

- \*Tell me about yourself.
- \*What did you like in the presentation about Oracle?
- \*Given a location preference, which location would you choose, why?
- \*Your one quality, that makes you stand apart from others.
- \*Your one weakness, that would affect others working in the firm.
- \*Any future post-graduation plans.
- \*What other companies have you applied for?
- and many more typical HR questions.

Selected 7 students.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

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## Oracle Interview Experience | Set 33 (On-campus Application Development Engineer)

Cut-off was 7 CGPA

**Online test:** This round consist of 4 Sections. Each section consists of subsections. Each subsection has its own time limit.

1. General **Aptitude**, Analytical & Mathematical reasoning
2. **Software Engineering**
3. **English**, Verbal Ability & Vocabulary
4. Computer Science concepts & **Programming** skills.

This round did not have any negative marking, although there is timer for each sub-section, and you cannot go back and solve a previously completed section.

They shortlisted 74 candidates after this round for face to face interviews.

**Round 1 Technical:** (25 min. approximately)

The interviewer first took a copy of my resume and then she asked me about myself & my projects.

1. Write a function to generate a random value. The function should return different values when we run it at different timestamps.
2. Define Abstract class & the **Difference between Abstract class and Interface**.
3. Which data structure suits best to implement a file system structure?
4. Using that data structure write a code to print the names of all the files and folders in a given folder.
5. What is **Hashing & Hash map**?

**Round 2 Technical:** (40 min. approximately)

The Interviewer welcomed me into the interview room with a warm handshake and then we had a nice discussion on my project that I did on my internship & what technologies I used.

1. How to connect a java code to a database?
2. He gave me a situation and asked me to give a database schema consisting of primary key & foreign key. And then according to that design he asked me to write **SQL queries**.
3. Define Joins. Write a query to perform a natural join.
4. Then he asked me some questions related to computer networks. IP/TCP/UDP/HTTP.What is the difference between HTTP & HTTPS?What is SSL?
5. Some questions based on sockets like how server and clients are connected and the mechanism that how they communicate by sending and receiving messages.
6. Two trains are travelling in opposite Directions. Speed of Trains are "S". Distance between them is "d". A bird which is moving with "2S" speed from one train to another train collides, rebound and then collides with first train and so on. Find the total distance covered by the bird when the trains hit each other.
7. **Find the largest substring which is palindrome.**
8. This question was different. The fingers of a hand is numbered like this: Thumb-1, Index-2, Middle-3, Ring-4and Pinky-5.

Now the sequence goes like this: Thumb->Index->Middle->Ring->Pinky->Ring->Middle->Index->Thumb->Index->Middle->Ring->Pinky->Ring->Middle->Index->Thumb->.....

Find the finger in which  $n^{\text{th}}$  term is present.

Eg: If n is 13 then answer is Pinky finger.

If n is 8 then answer is Index finger. If n is 11 then answer is Middle finger.

**Round 3 Technical:** (20 min. approximately)

1. Tell me about yourself.
2. [Banker's algorithm](#).
3. Implement [Merge sort](#) algorithm. Then he asked me to explain real world example of this algorithm and the time complexity explanation.
4. [Normalization](#) (Specially BCNF form).
5. Outer [joins](#), left join & right join.
6. Do you have any question?

**Final Round HR:** (10 min. approximately)

1. How is your day?
2. Why Oracle?
3. Do you want to do any higher studies?
4. About my Internship experience.
5. Location preference.
6. Then we discussed about salary breakup.
7. Any questions?
8. Finally they said, "See you soon in Oracle "

The whole process was started at 8 in the morning and the final result came at 12 in the midnight.

**Pro tip:**

1. It is better to write your code in [java](#) in the interview as Oracle prefer Java coding.
2. Along with Data Structures & Problem solving, have a grip on DBMS, Computer Networks and Object Oriented Concepts.
3. When interviewer asked to tell something about yourself don't say so much about your history or family background.  
Let the talk go in productive way, like talk about your internship or any project you have done so far.
4. Always ask something at the end of the interview. Specially when they ask you "Do you have any question?"
5. Show your passion towards coding as you are living only for coding :)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 32 (On-campus for Global Business Unit)

**1st Round : Online Test (60 min)**

4 sections : Aptitude, Software Skills, Computer Science Knowledge, Coding Skills

Each sections has subsections.

**2nd Round : Coding Round (2 questions 60 min)**

1st Que :- Given a start time and end time in a digital format, you need to count the occurrence of each digit.

**Input :** 23 53 09  
23 53 10  
**Output :** 0 1 2 4 0 2 0 0 0 1

Explanation : 0 occurs two times, 1 occurs one time, 2 occurs two time, similarly count the occurrence of each digit till 9

2nd Que :- Given a directed graph. You need to find the no. of cycles in the graph.

**Input :** 5  
1 2  
2 3  
3 4  
1 4  
4 1  
**Output :** 1

**3rd Round : Technical Round 1 (about 30 min)**

1. Tell me about yourself.
2. What is paging. Explain.
3. Which data structure is used for paging? Explain.
4. Which is better stack or queue for paging? Explain.
5. What are the different page replacement algorithms? Explain each of them with small example.
6. Which programming language you are comfortable in?
7. What is the difference between procedural and object oriented programming?
8. Features of object oriented programming.
9. What is inheritance? What is its benefits? Give a practical use of inheritance.
10. What is encapsulation? Why to use encapsulation?

11. Given a set of numbers like  $a = 1$ ,  $b = 4$ ,  $c = 7$ ,  $d = 11$ , and a target number  $T = 6$ . You need to find out the neighbours of target  $T$  from the given set of numbers. Now here 4 and 7 is neighbour of  $T$ . The output should be in the format : "The neighbours are b and c". Note that  $b = 4$  and  $c = 7$ . The set may be large.  
 You cannot use any STL containers or any STL functions like binary search, etc.  
 You have to write the naive code for the above.  
 If you wrote the code in one way, he would ask you to write in another way. Explain the code.
12. Given a string 1234ACVDSqwerr1234@&. You need to print all the digits, uppercase letters, lower case letters separately, nothing to do with the symbols.  
 13. What are pointers? What are advantages and disadvantages of pointers?  
 14. Do you think java is better than c++? Why does java do not have pointers? How does java overcome the need of having pointers?  
 15. If you had to make one library, how would you know which part of your code should be private, public or protected? Why would you make it private, public or protected?  
 16. Do you play sports? Are you good at any sports?

#### **4th Round : Technical + HR Round (about 45 min)**

1. What questions were asked in the TR1?
2. Tell me about yourself.
3. What are your favourite subjects?
4. What is data structure? What are different data structures available?
5. What is linked list? How is it different from array?
6. What is trie?
7. What is tree? How is it different from linked list?
8. What is difference between binary tree and a tree?
9. Can left subtree of a tree have no child but right subtree has child? Explain. (Explain considering ordinary tree, complete tree, full tree)
10. Amazon uses which data structure and why?
11. Do you think amazon should use tree? why or why not?
12. Do you think amazon should use linked list? why or why not?
13. How is filtering done in amazon?
14. Which sorting algorithm would amazon be using?
15. What is Merge sort?
16. What is heap sort?
17. Compare heap sort and merge sort?
18. Is quick sort better than merge sort?
19. What is meant by time complexity? Explain with respect to online shopping.
20. Questions related to projects.
21. Why should we hire you?
22. Tell us what you have done in your life?
23. Is it your first interview?
24. Family background.
25. Are you not good at any particular sports?
26. Why you chose to be an engineer?
27. What is the goal of your life?
28. Why do you want to work at Oracle?
29. Can you relocate in any part of India?
30. Do you have any questions for me?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

## **Oracle Interview Experience | Set 31 (On-campus for Global Business Unit)**

**Round 1:** It was an online MCQ round consisting of 4 parts – Verbal, Aptitude, Computer Science and Programming Knowledge.

Computer Science section consisted of questions based on OS, DBMS, Software Engineering. It also had some questions on time complexity of certain written codes and of sorting algorithms.

Programming :

- This section focused on ability to understand codes. Questions basically on AVL tree, BST tree and linked list were presented in form of codes and had to find output of those codes. One program had about 5 questions.
- We also had question based on flow charts.
- One really had to be clear about the concepts of linked lists, stack and queues.

**Round 2 :** Online coding round consisting of two questions.(Time : 1 hr)

- First question of general implementation
- Second question was based on directed graph.

**Technical Round 1:**

- Brief introduction of myself.
  - Then he asked me how would I create a database of people with adhar number, name and father's name.
  - Second question was to implement a calculator which would perform basic operations of +, -, \* and /.
- He asked me to write full working code with boundary case handled in any of the preferred language C, C++ or Java. Then he went through my resume and asked I wrote the code he asked me to explain it. Then he also asked about how would I extend my code to make it work for scientific calculations like  $\sin(x)$ ,  $\cos(x)$ , etc.
- After he had gone through my resume, he asked me to explain one of the recently solved questions on any online programming platform. I had recently solved Codeforces Div 2 question and explained the question to him. He also asked my approach how I solved the question. I made him walk through the solution of  $O(n^2)$  complexity to  $O(n)$  complexity.

**Technical Round 2 :**

- Brief introduction of myself.
- Difference between array and linked list. Advantage of array over linked list.
- Which language I prefer out of C and C++ and why ?
- Which was my favourite data structure and algorithm and why? I replied with array and DFS and explained my reasons.
- Why I had interest in Data Structure and Algorithms ?
- Which data structure between array and linked list would I prefer if I had 10, 100 and 1000 elements ? I had to give my answer both in terms of time and space complexity.

```
- class A { ... };
```

```
A ob; // Declaration 1
```

```
A *ptr = new A(); // Declaration 2
```

Difference between these two declaration.

- To write a code explaining the working of copy constructor.
- Static classes.
- Given a linked list of size "N", how would I delete 5th element from last ?
- He asked me to write working code of reversing a linked list.
- Difference between calloc and malloc. Also he asked me to write the syntax of these two.
- Given a stack and a queue. At any point of time let stack hold N1 elements and queue hold N2 elements.
  1. If N1 and N2 both are odd, swap the middle elements of stack and queue.
  2. If N1 and N2 both are even, then we would have two middle elements in stack and two in queue. Out of these four elements swap the max element with the min element.
  3. Do nothing otherwise.

Although I couldn't solve the question fully, I gave him my approach and he suggested me to solve this question using min stack algorithm and implementing queue using two stack.

- Why I started competitive programming ?

Overall at the end of the day, it was all my competitive programming experience that helped me in those four rounds. I would really like to thank Codechef, Codeforces, Hackerearth and GeeksforGeeks for providing me such a wonderful platform to improve myself.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 30 (On-campus for Global Business Unit)

Round 1: MCQ questions divided into 4 parts – Verbal, Aptitude, Computer Science and Aptitude, Programming Knowledge

Computer Science and Aptitude: Questions on C, C++, dbms, OS, Software Development. The key point was managing time.

Programming Knowledge: The following types of questions are there,

- \* Given a program (BST, AVL tree, and other trees) and you need to answer questions based on these codes. (One program 3-5 question)
- \* Given a Flow Chart diagram and you need to answer based on it.
- \* Basic questions on time complexity, stack, queue, linked list, array.

### Round 2: Two programming questions were asked, (Time: 1hr)

Question #1: Given two time (in 24 hr format), start and end. And you need to tell how many times a digit repeats if time moves from start time till end time. (for more clarity view the input test case)

\* First line contains start time and second line contains end time.

Input:

23 00 00

23 00 01

Output:

7 1 2 2 0 0 0 0 0

\* The number of times 0 repeats is 7 and so on...

Question #2: Given a directed graph, and you need to find how many cycles are there in the cycle such that their length is equal the length of the maximum length cycle in the graph.

#### Technical Interview 1:

- \* Introduce yourself
- \* He asked me to implement a calculator which operates similar to Windows/ Android calculator. (To give the complete clarity on question he showed me working of a calculator on his mobile)
- \* He then asked me to write the psudo code for a problem – To find an object in the given maze. Basically, you need to tell whether the object can be found from start position or not, also optimizing your code such that path where you didn't find the object should not be traversed again. After writing pseudo code he asked me to write the complete working code, handling the corner cases. Finally we had a discussion on, why I used vector instead of list. He was impressed with my solution and choice of data structure.

#### Technical Interview 2:

- \* Introduce yourself
- \* He said "there is no JAVA in your resume, why so?" and then asked me to say points on why C is better than JAVA (I was able to tell 2 valid points).
- \* What happens when a url is typed in your chrome and pressed enter. (I gave a convening answer)
- \* What all problems you see while you book a tatkal ticket and how would you tackle the problem when the website becomes overloaded. (Was able to relate to basic OS concepts)
- \* Given a equilateral triangle, and at each vertex of the triangle there is an ant. Ant will only move on the lines connecting vertices, also each ant will move with same speed. What's the probability that any two ants meet. (Solved but took time)
- \* Given X squares (1X1 dimension), can you place it on a plane and form a big square using them, if so, write a program which could verify on each input X. (I was able to give two approach- using inbuilt functions, and using prime factors)
- \* You need to write a code which could tell the first number N, which has X factors. (I was able to tell brute force and prime factorization method – he was impressed with my second approach)
- \* Given a database definition and you need to normalize it. (I haven't done problems like this before, so was unable to solve it)
- \* Define meta-log, schema
- \* He finally asked the 2 egg and 100 floor question.

Finally, I would like to say competitive programming really helped me in cracking the interview, and would like to thank **CodeChef, SPOJ, and GeeksforGeeks** for it.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 29 (On-Campus for Server Technology)

Recently Oracle came to our campus for Server Technology and Applications Engineer Profile. Here I am sharing my experience of Server Tech.

### Round – 1

This was an aptitude round comprising of four sections – General Aptitude (Basic Maths, Logical Reasoning, Mental Ability, etc.), English for Communication, Software Engineering principles and Coding Basics (C, C++, JAVA, SQL). There was no negative marking. After this round, they shortlisted around 40 people for Server Tech and 70 for Apps.

### Round – 2

This was a coding round only meant for people shortlisted for Server Tech. It was a no elimination round. Mostly it was meant to ease up the interview process. There were two questions out of which one had to be done.

1) An array is given. Find two indices ( x and y , y

Round – 3

This started with a series of interviews. Following are the questions that were asked to me in the series of rounds that followed :-

### Technical Round – 1

Started with general questions like "Tell me about yourself" with the interviewer taking a look at my resume in the meantime. Then asked me about my internship experience just to break the ice. Then the round started :-

- 1.) OOPS concepts – abstraction, inheritance, encapsulation. What, Why, How?
- 2.) Basic C/C++ questions on pointers, structure, class, exception handling.
- 3.) Then he gave me a basic program to output the prime factor representation of a given number n. Eg :-  $36 = 2^2 \cdot 3^2$ .
- 4.) Once done, this followed with tree questions. What is a balanced tree? Give a few examples. Write a program to find the minimum number of nodes that need to be added to a tree to make it balanced.
- 5.) Code for self-balancing in an AVL tree.
- 6.) Code to find the height of a tree.
- 7.) Followed with graph questions. Code for minimum spanning tree of a graph. I chose Prim's MST algorithm. The interviewer also asked me to describe Kruskal's and then asked why I chose Prim's over Kruskal's. What are their time complexities, advantages and disadvantages.

Then he asked if I know Operating Systems or not. But then being a Electrical Engg student, I don't know much about it. So I told him, I just know the basics. He asked

me basic linux commands like – “Finding a running process (ps), Viewing a file (vi), List all the disks and their space (df), Replacing a pattern with another pattern (sed) and awk. I got stuck on awk. Still he carried on and asked me about piping.

I could answer all these questions correctly. I was then called for the second round

#### **Technical Round – 2**

Again, the interviewer started with a look at my resume and asking questions from it. This round was mostly based on my internship project. I was asked on the technical details, the technology I used, the challenges I faced and how I solved them. I was also asked the details about the coding round questions.

Only two technical questions were asked in between :-

- 1.) Given two linked lists find out if they intersect or now and if they do, find out their intersection point.
- 2.) Given inorder and preorder traversal of a tree, find out the tree. Followed the same with inorder and post-order.

Then he asked me a design question. How will I design a social networking site like Facebook. Which data structure would I use and why? What would be the implementation and time complexity of any functions like adding a friend, finding if two persons have a common friend, blocking a person, privacy, etc.

I could answer these questions properly too. He finally asked me a commonly known puzzle about 25 horses and 5 race tracks. Finally, he said he was done and asked me to ask any questions if I want.

Before I move on, I would just like to tell that they don't expect you to arrive at the best algorithm for any problem instantly. Also they check if you have just mugged up any algorithm by tweaking the question a bit, once u tell the answer or by getting into intricate details. They just check your approach to the problem. So, don't give up if you don't get the best solution. Give it a shot and tell him your approach. Be loud, it helps.

For people with non-CS background, prepare data structures like tree and graph very properly. Also a good grasp on algorithm designing techniques (greedy, DP, divide-and-conquer, branch and bound) and OOPS concepts is really necessary if you want to get into any of the top-notch companies. Don't waste much time preparing OS, DBMS, CN. Just get an overview on them. They know you haven't had these subjects in your curriculum.

#### **HR Round – 1**

In this round, they just asked me details about my internship, my CGPA. Then the topic moved on to the important subjects which I had to study to bridge the gap to get a software profile, me being an EE student. Then just some basic OOPS, multi-threading concepts again. It ended on a positive note.

#### **HR Round – 2**

This was the last round. The HR told me the necessary details, of the work profile, the compensation and its breakup, work-culture, etc. He also asked me my work location preference out of Noida and Bangalore.

I would like to advise anyone seeing this to ask questions they have in mind to all your interviewers. It makes a positive impression.

Finally, I would like to thank the GeeksforGeeks team for creating such a superb resource for free on the internet. I went through previous interview experiences of the same company before the interview. Although the questions weren't repeated, it gives you a fair idea about the topics that are likely to appear before you and to boost your confidence.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

## **Oracle Interview Experience | Set 28 (Application Development Engineer)**

Cutoff : 7 CPI

Oracle came here with two profiles, Applications Development and Server Technologies. The written test was common for both the profiles.

#### **Written Test (Initial Screening Round):**

The written test consisted of 4 parts .Each part had a few more sub-parts which are to be answered in 120 mins.

1. Grammatical, spoken English and passage analysis.
2. Analytical, Mathematical reasoning.
3. Programming skills. ([Data structures](#), [C++](#), [Java](#))
4. Technical knowledge. ([Operating Systems](#), [DBMS](#))

The shortlisted candidates were called for the interviews.

#### **Interview: Round-1(Technical)**

The interviewer first took a copy of my resume and interviewed me a bit on my programming language. And then I was given a few problems for which I've to write the code.

1. [Find the height of a binary tree](#).

This question was to just test the speed and I was supposed to code it within 2-3 minutes.

2. [Given a linked list, check if it's a palindrome](#).

First, I was to give my own solution and then to optimize it to be done in  $O(n)$  time and  $O(1)$  space complexity.

3. Assume that there are n houses in a row and the value of the properties in the house is given. Suppose, A thief wants to rob the house. What's the maximum profit he can get given that he can't rob two adjacent houses without being caught.

Once I finished those codes, I was asked to wait for a few minutes for the next round.

#### **Round-2(Technical):**

The Interviewer welcomed me into his cabin with a warm handshake and after exchanging pleasantries he asked me if I was familiar with strings apart from trees and linked lists which he came to know from my first round.

**Problem Statement:** Given a string, print all the strings that can be formed from using 2 or more letters of the given string which are valid dictionary words. The function Boolean isValid(string) is already provided that checks if a string is a valid dictionary word.

**Solution:** I tried to generate all the possible sub sequences and then find all the possible permutations of each sub sequence. The complexity of my approach was very high  $O(n^n)$  and he asked me if there can be any approach. Moreover, he asked me to solve it using linked lists for which I said I can't.

After that, he asked me a few puzzles and then told me to wait for my next round.

**Round-3(Partly tech and partly HR):**

The interviewer thoroughly examined my resume and pointed out my academically poor performance for which I told that I wasn't good at getting things by heart. And then I pointed out that I had done a poor job in my first year and that I'd been constantly improving. He found that a bit satisfactory but despite me being the first guy to reach till HR round he wasn't willing to give me a chance.

And then he asked me that why should they even give me a chance. For which I replied that I'd been improving myself and that he could ask me anything from my resume and that I'd answer. He's smiled a little and asked me about my projects which were on DBMS. I told him that I've done the back-end processing entirely by myself.

So he asked me if I knew how a shopping site like Flipkart or Amazon works. (I was supposed to know according to my projects). I said yes and so he asked me to design a site that would log a user in, let's him search for and order those products. I was supposed to roughly sketch the web pages and as well as explain the underlying query processing and database management. I'd done that in like 35 mins and he asked me if the tables in the database were normalized. (ofc I normalized them beforehand :P). And he was kind of impressed and asked me a few more questions on normalization etc (The DBMS part). After a few more minutes he told me that I could have my final round after the lunch break.

**Round-3(The Final Round aka HR):**

I was asked of my previous interview experiences and of any other companies I'd applied prior to going there. I told that I'd been to Amazon (which I shouldn't have said). And so the ma'am asked me if Amazon was my dream company. (I said nope, of course everyone would :P). And then a few general questions like why Oracle? Is the package satisfactory? Etc. Finally, she asked my job location preference and I was told to wait for the E-mail.

Few things I feel worthy to share:-

1. Pointer is not everything but the interviewer will try to judge you by your pointer. So be on guard.
2. Brush your coding skills before you walk in there.
3. Never use brute-force unless you can't think of anything better.
4. And finally, Your resume must've a project and you should know of the project thoroughly.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 27 (On-Campus)

### ROUND 1:

90 Minute Online Round: QUESTIONS were 10 General Aptitude, 20 Coding Skills, DBMS and OS Questions, English. Questions were Easy but every section had a time limit and you cannot use the remaining time for another section. And once you submit you cannot change the answer no negative.

After first round they shortlisted 76 for Application profile And 39 for Server tech profile.

Server Tech guys had one hour coding round with 2 questions.

1. <http://www.geeksforgeeks.org/minimum-length-unsorted-subarray-sorting-which-makes-the-complete-array-sorted/>
2. Some overlapping intervals problem I don't remember But it was Tough.

Platform was their own Oracle Cloud.

No Elimination after coding Round.

Application people had 3 tech Interviews followed by HR.

Server people had 2 Tech followed by HR.

For Application Interviews:

**1. Tech(F2F)(For 30-45minutes)**

Basic questions-(Collection of my friends questions also)

Find each character frequency in string.

Check whether a palindrome

Length of Longest Non Repeating Subsequence

Explain how facebook works

Why Finally Block is used in java

Difference between Error and Exception

Print some Patterns

Diameter of a tree

Reverse a LinkedList

Puzzles:

1. 12 balls are there one is defective (may be heavy or light) find the defective ball also whether heavy or light in 3 weighings.
2. Oranges Apple puzzle
3. Burning Rope puzzle
4. Stop Clock of 7 and 4 is there measure 9 minutes.
5. Two trains travel in opposite Directions. Speeds of Trains are given. Distance between them is 'd'. Find Speed of bird which is moving from one train to another before the train collides.

They were giving a feedback of your Coding, ProblemSolving and Communication Skills.

## **2. Tech(F2F)(For 60 minutes)**

1. Josepus problem
2. Detailed Discussion on Project.
3. Calloc and Malloc differences.
4. Oracle is the string if your input is "cle" return true, input="cleo" or "acleor" return true—return true if the input is substring of main string rotation is also considered.
5. File is there print Each word and its frequency in lexicographic order.
6. Find 3 and 4th highest marks of students in c.
7. Dining Philosophers problem.
8. Implement your own rand() function.
9. Why do we use Graphs?
10. Mirror tree Generation , no of paths from Source to Destination, Root to leaf Paths..
11. Check whether a number is divisible by power of 2.

## **3. Tech(F2F)(40 minutes)**

1. Questions on pointers(deep Discussion).
2. How do you return multiple values from a function.
3. Why do you use a SelfJoin Examples
4. When do we use a Left outer join
5. How memory is Allocated for Structure and Array.
6. More questions on DBMS.
7. Bankers Algorithm to Prevent Deadlock.
8. Difference between compiler and interpreter.
9. Sieve of Eratosthenes for Prime numbers.
10. Interested in higher Studies?
11. Some behavior Questions.

## **4. HR**

Normal HR questions.

Why not MS.

Why Oracle.

Package Discussions.

Thank u is really a small word for GeeksforGeeks Your a Life Saver Keep up the GoodWork:)

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

## **Oracle Interview Experience | Set 26 (On-Campus for ST Full Time)**

### **Round 1**

This round was an online round consisting of sections for:

- a) Coding skills- multiple choice questions on trees, arrays etc.
- b) Computer Science skills: OS, DBMS.
- c) Software Engineering skills: Flowchart related questions, all kinds of aptitude questions.
- d) English skills

This round did not have negative marking, although there is timer for each section, and you cannot go back and solve a previously completed section.

I was shortlisted for Server Technology profile after this round.

### **Round 2**

This round was an online coding round, but there were no eliminations from this round. This was only to speed up the process during the interviews.

Question 1: There is an array representing 'n' sums of money that can be won by Manoj. Manoj can choose any amount X from the array to remove, but then his friend will remove X+1 and X-1 amounts from the array. Find the maximum amount of money Manoj can make.

Note: remaining elements in the array after removal of X, X+1 and X-1 will be the amount Manoj will get. X represents the actual element in the array.

Question 2: Given two integers n=number of players in a team and k=number of pairs, find the number of players in the weakest team. The weakest team will have the minimum number of players.

I/P: 5 3 // n=5, k=3

1 2 // pair has player number 1 and 2

2 3 // player number 2 and 3

4 5 //player number 4 and 5

O/P: 2

Explanation: Player numbers 1,2,3 form one team and 4,5 are in the other team, thus 2 members in the weakest team.

### **Round 3**

This round was a technical interview and it went on for about 45 minutes.

1. The interviewer started out by looking at my resume and projects. A thorough discussion about my projects and the technologies used.

2. Asked about the language I am most comfortable in. As C was my answer, he asked me to write any significant code that would give segmentation fault. After I showed him the code, he asked me how would I go about debugging it.
3. Questions on pointers to function.
4. 0-1 Knapsack Problem- resume based, had done a project using this algorithm.
5. Difference between file systems and databases.

#### **Round 4**

Again a technical interview for about 30-40 minutes.

1. Given a 3\*3 unsorted matrix with repetitive elements, search an element. I used quick sort and binary search. He asked me why I am using these algorithms, just to test if I stand by my answer. Then asked to write the full code for the program in Java.
2. How to you change the user password for a database? Had to write a query for it.
3. Given a table with employee salaries and names, return the nth highest salary with a single lined query.
4. General project/internship discussion.

#### **Round 5**

This was an HR round that went on for about 10-15 minutes.

1. Tell me about yourself, family background etc.
2. Location preference, salary breakup.
3. Why Oracle?
4. I was free to ask any questions if I wanted to.

Thank you GeeksForGeeks for the amazing preparation resources.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

## **Oracle Interview Experience | Set 25 (On-Campus)**

#### **Round 1**

This was an online round. There were three sections :

1. Aptitude and logic
2. Data structures(mainly [binary tree](#)), OS, DBMS, OOPS.
3. Data analysis

#### **ROUND 2:**

Online coding round:2 codes:

Code 1: given an array and a player. The player selects elements from array. If the player selects an item with value i the he/she cannot select i+1 or i-1. Find the maximum sum of value the player can select.

```
I/P : 4 1 2 8
O/P : 14

I/P : 9 7 4 5 6 1 2 3 8
O/P : 25
```

Code 2: overlapping interval find the interval with less difference.

```
I/P :
O/P : 2

I/P : none
O/P : 0
```

#### **TECHNICAL ROUND 1:**

1. tell me about yourself?
2. Some questions on [c/c++](#) aptitude? i.e, based on pointer, [static variable](#), recursion
3. [Reverse the words of the string](#)
4. Write pseudo code for the [4 queen problem](#) for 4\*4 chess board
5. Given tree do all traversals.
6. Given a big file sort it? Big in the sense doesn't fit into memory.

#### **TECHNICAL ROUND 2:**

1. Puzzle: You have 10 boxes of balls (each ball weighing exactly 10 gm) with one box with defective balls (each one of the defective balls weigh 9 gm). You are given an electronic weighing machine and only one chance at it. How will find out which box has the defective balls?
2. Puzzle: Pirate one: Four people need to cross a rickety bridge at night. Unfortunately, they have only one torch and the bridge is too dangerous to cross without one. The bridge is only strong enough to support two people at a time. Not all people take the same time to cross the bridge. Times for each person: 1 min, 2 mins, 7 mins and 10 mins. What is the shortest time needed for all four of them to cross the bridge?
3. [Check given link list is palindrome](#) or not in O(n) time and O(1) space.
4. Some 3-4 questions related to [sql](#) query.

## 5. String related questions

### TECHNICAL ROUND 3:

1. Asked me to explain `merge sort` and was asked to write complete working code for it.
2. project related questions

### TECHNICAL ROUND 4:

1. Given  $n$  coordinates find 5 coordinate which will form polygon
2. Given one array of size of  $n$  design 3 stack such no stack could give overflow when there is space available in array.
3. Design a directory for phone and name.

I didn't get call for HR. Hope this will help !!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 24 (On-Campus for Global Business Unit)

**Round 1 :** multiple choice questions based on Aptitude: Work and time problems, speed and distance problems, permutations and combinations, age related, relations (father-son), etc

Note. U should be really fast at it since u would have not more than a minute for each question

Verbal: this was not that tough to crack. If you are decent enough with vocabulary and grammar u can do well.

Computer science aptitude: questions on C , Cpp, dbms (variables like Inout out and in) , triggers ,procedures, Operating system, ooad(one or two ques),

Programming knowledge: Debugging, guess the output, given a flowchart with multiple blank boxes fill them with appropriate statements(one flowchart would be given and upto 5 questions or entire subsection will be based on that flowchart. But again in this round time is key factor. One must be as fast as he/she can.)

Data Structures and coding: any one topic from trees (avl balancing, red black etc) ,stack, queue,circular queue(using array or linked list) will be randomly presented and the entire section containing about 8 to 10 ques will be based on that one topic.

Snippet of code will be given and some mistake where we must choose correct part of code from given options.

**Round 2:** Two questions to be coded and compiled on their cloud compiler

1. Engineer will have first child as engineer, second as doctor,

doc will have first child doc , second as engineer, generation starts with engineer and doubles every generation.. because all will have 2 kids

so 1st gen = E

2nd gen = ED

3rd gen = EDDE

4TH gen = EDDEDEED and so on ... given generation number and child number , say if that child is engg or doc

2. Given a string of multiple words where a word might contain two or more repeating characters. Print the word with maximum such repetitions .if two or more words have same number of (max)repetitions then print them in lexical order.

Eg:input:"The college is in Massachusetts"

Output: Massachusetts (since 8 score)

**Tech Round 1 :** Introduce yourself, then asked about my projects. Getting keen about them discussed about half an hour on the same. And them program to convert infix expression to postfix expression.

Normal forms, oops concepts.

**Tech Round 2 :** Introduce yourself, asked about my education and interests, then about my internship.

Questions which would test your thinking ability such as

1. Design a database for an e-commerce site
2. How would you find one duplicate line in a text file consisting of one lakh lines.
3. Design an elevator controller to control two or more lifts which work in favour of the user(they serve you in least time possible)
4. What data structure would u use for developing a contact list consisting huge contacts such that searching is faster.
5. OS concepts like paging, segmentation, thrashing etc

I would like to thank geeksforgeeks for their excellent resource and quality.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

# Oracle Interview Experience | Set 23 (On-Campus)

1st round consists of 4 sections- general aptitude, logical, verbal, and technical (OS, DS, DBMS, big O notations, codd rules, ooad). total 90 mins duration.

## First technical interview

Tell me about yourself?

Which language are you comfortable in for coding?

Given a large array, program to count frequency of each number in an optimized way?

Program for multiplication of two numbers consists of 20 digits each?

Given almost a postfix expression, program to get the result?

Given a excel sheet, get the column number of ABCD and column name of 6532?

When all the numbers of different combinations consisting of 1,2,3,4,5 are arranged in increasing order, give the rank of number 35421 ?

Given an array of positive and negative numbers, arrange them in such a way that all positive numbers at one end and negative numbers at other end (size of array is large and unknown)  
about projects

All solutions should be optimized

## Second technical interview

Tell me about yourself

Explain about the questions asked in first interview and your approaches.

Given a number 4

1,1,1,1

1,1,2

1,3

2,2

all the sets of this format without repetitions (code should be a generic one)

Given a number and string find whether palindrome or not

Given a string, find all possible palindromes (string of length 1,2,3.....)

Given a set of strings, strings which are unique (not repeated) should be printed in sorted order, repeated strings along with their frequencies if any string is concatenation of two strings from given set of strings.

About projects and currently working project

All solutions should be optimized

## Third technical interview

Tell me about yourself

Currently working project

What subjects are you good at

OS-swapping, thrashing, semaphores, paging, scheduling algorithms

DBMS-given tables, some queries on that, normalization and its forms with examples, primary key, super key, composite primary key, joins.

C-difference between call by value and call by reference

Java-interface, inheritance, super keyword, final keyword, extends, implements keywords, exception handling

Data Structures-queues, stacks, linked list, binary trees

Given an array from 1-100, find the missing number

Inserting a node in the middle of linked list

Given a array of repeated numbers, print the numbers in such a way that numbers are printed in increasing order of their frequencies and print the numbers in increasing order if frequencies are same and codes from data structures

## HR Interview :

Tell me about yourself

Family background in particular

3 strengths and 3 weakness

About preferred location

Some general HR questions

Throughout the interviews, your way of approach to a problem is observed

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

## GATE CS Corner Company Wise Coding Practice

# Oracle Interview Experience | Set 22 (On-Campus for Oracle Financial Services Software)

Written round: There were questions related to quantitative, logical and verbal. (Not of very high level, but speed should be good enough).

## Technical PI:

1. C: Basic topics of C. malloc and Calloc difference. Storage classes. Let us C is enough.
2. C++/Java: OOPs concept with real life examples, Collection in Java, Constructors etc. Site I referred: JAVATPOINT
3. DBMS: Explain normalization with the help of examples, ACID properties, Triggers, SQL queries.
4. Project related questions.
5. Puzzles from programmerinterview.com

DBMS and JAVA concepts should be clear.

## HR Round:

1. Tell me about yourself.
2. Which activities are you involved in other than academics?
3. How many companies have you tried before and how many rounds cleared?
4. What you did in internship and how much they paid you?
5. Strengths and weaknesses.
6. Any questions you have.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

# Oracle Interview Experience | Set 21 (On-Campus for Application Developer)

## I. First round(written) :

Online test(2 hours) consisting of:

Quantitative aptitude, logical reasoning, verbal ability, OS, DBMS, CN, C++, DS(mainly output questions).

## II. Technical Interview(F2F) :

1. Tell me something about yourself.
2. What will be the angle between hour hand and minute hand at 3:15 PM in a clock.
3. Write code to calculate angle between hour hand and minute hand at X:Y in a clock.  
Input: X, Y.  
Output: Angle b/w hands.
4. Puzzle: <http://www.mathsisfun.com/puzzles/the-fly-and-the-trains.html>
5. Puzzle: <http://mkcohen.com/saturday-puzzle-9-apples-and-oranges>
6. Implement stack using two queues.
7. Insert a node at nth position in a linked list.
8. Delete the node at nth position in a linked list.
9. Give an idea about BFS.
10. Interviewer asked me to write two SQL queries based on given two tables.
11. Explain normalization and its forms.
12. What is join? Why is it used?
13. What is ER diagram?
14. Explain CPU scheduling algorithms.

## III. Technical Interview(F2F) :

1. Find smallest and second smallest element in an array. <http://www.geeksforgeeks.org/to-find-smallest-and-second-smallest-element-in-an-array/>
2. Find median of an array. Time complexity: O(n)
3. Detect and remove loop in a linked list. <http://www.geeksforgeeks.org/detect-and-remove-loop-in-a-linked-list/>
4. <http://www.geeksforgeeks.org/stock-buy-sell/>
5. Puzzle: <http://www.crazyforcode.com/2-eggs-100-floors-puzzle/>

## IV. Technical Interview(F2F) :

1. Tell me about yourself.
2. Interviewer asked me about my project.
3. <http://www.careercup.com/question?id=13364665>
4. <http://www.careercup.com/question?id=14260662>
5. <http://www.careercup.com/question?id=7853661>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 20 (On-Campus for Oracle Financial Services Software)

OFSS visited our campus for recruiting associate application developer .

There were 3 rounds in all

- 1) online test
- 2) technical interview
- 3) HR interview

#### 1) Online Test

The test broadly consisted of 4 sections

- Coding outputs (mainly trees, AVL trees)
- English (Grammar,RC)
- Computer Science subjects (DBMS,OS,DS)
- Aptitude

The test lasted for 2 hours. The key here is managing time. Questions were of average level but time was not sufficient .

I was shortlisted for 2nd interview .

#### 2) Technical interview

The interviewer was very friendly . He started by “tell me about yourself” . He then asked me

- Normalization in DBMS with examples
- Different sorting algorithms and their implementation in real life.
- Doubly linked list with real time examples.
- Minor project
- Internship
- Difference between UNION and UNION ALL
- Difference between UNION and JOIN
- Different types of JOIN with examples.

He was impressed with my minor project and internship .

He also concentrated on communication skills and confidence.

#### 3) HR interview

Very general questions. Strength and weakness. Asked about location preference .

Thank You geeksforgeeks !!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 19 (On-Campus for App Development)

#### Online round

Mcqs of apti and technical questions

#### Interview 1

1. Database design for my project... Had to make improvements to the ridiculous design of my project on the spot.
2. Reach from 0,0 to m,n on a 2d grid having values in each cell.. Find the minimum sum path if u can move only right or down
3. Html rowspan and colspan implementation.

#### 2nd interview

1. 25 horses puzzle

2. OOPS concepts with practical questions (he wrote codes and had to predict which functions will be called)
3. What is the need for polymorphism if we can give a diff name to each function.
4. Explain code of previous interview.

### 3rd interview

1. Draw ER relationship model for flipkart
2. Phases in software development. Advantages of prototype over waterfall model
3. Simple 10th standard maths problem
4. Do you want to lead or follow (a diplomatic answer would be "I'll follow till I am capable of leading")

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 18 (On-Campus) for GBU App Development

Oracle GBU on campus selection.

### 1st round

Mcqs of apti and technical questions.

### 2nd round

4 puzzles

1. 2 glasses with same amount of coke in one and lime juice in other.. 1 spoon transferred from 1st to 2nd. 1 spoon from now what is in second to 1st. Which glass has more of the other drink
2. Males always tell truth, females always alternate on truth and false starting with any. Child tells u it's gender but u didn't understand. Parent1 says child is boy. Parent2 says child is lying. She is a girl. Find genders of all of them. (statement may be a little wrong, I don't remember exactly)
3. A bag has orange and strawberry candies. You take two out repeatedly at random. If they are same, you put one orange in it else you put a strawberry and remove the two taken out. If u know the number of candies of each type in the starting, can you find out the candy remaining in the end when only one remains.
4. A puzzle about 4 brothers and their eye colours

### 3rd round (code on paper)

(only for those who did 3 questions correct in the last round, direct interviews for those who did 4, I did all 4?)

1. Print all root to leaf paths in a tree.

### 4th round

1. Questions about implementation of OOPS concepts
2. 1 pattern series completion
3. 2 maths problems
4. Find min max elements in an array
5. SQL query to find 4th largest salary

### 5th round

1. Given n rectangles' coordinates, find the area of all of them combined (taking overlapping area only once).

Reduce space to O(n<sup>2</sup>) and time complexity to O(n<sup>3</sup>)

2. SQL query to find 5th largest salary.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview Experience | Set 17 (On-Campus)

### 1st round

apti questions  
coding questions  
logical questions  
analytical questions

2nd round on paper coding everyone got diff question. These questions I collected from my friends

1. Sort the array such that even numbers in ascending order and odd numbers in descending order
2. n number of cards will be given out of 52 playing cards sort them according to colour and value
3. 4x4 matrix given which contains characters. One word will be given check all character of given word are present in array or not
4. A long string of numbers will be given like 99100102103104016 find the missing number here 105

it can be of 1/2/3 or any length numbers ex 1234568 or 1112131416 or 9101113 or anything  
others are also there

---

### 3rd round TR

2nd round is not a elimination round

total 60 people were selected for 3rd round

interviewers are friendly

my interview:

1. mine was sorting array problem (2nd 1st one) he asked me to explain my logic

2. told me to write test cases of all cases and to execute them

3. mine was  $O(n^2)$ . he told me to optimize

4 i used insertion i told him it will take less time in best case

5. then he told me to use merge sort. i didn't got the idea how to implement merge sort with two different logics he gave me idea then i understood and written the logic while writing i observed one more error and i told him that and i corrected it. then he changed the logic i have to sort the array in zig zag fashion. i did it (thanks to gfg <http://geeksquiz.com/converting-an-array-of-integers-into-zig-zag-fashion/>)

6. he read my complete resume each and every line in between he was asking simple questions about my resume.

7. then he asked me "tell me about yourself that is not in resume".

8. some management questions like i have convince my client to purchase a recently designed product,

i am a shopkeeper in a footware shop i have to sell a shoe which is available in all other stores, but he has to buy it in my shop only

9. puzzles: two ropes which burn in 1hr measure 45 mint... problem

12 balls, 11 are same weight one is faulty weight (we don't know it is less or more) classical balance given min number of turns needed

10. my project was on php and mysql so he asked so many questions about that he asked database design of the project i explained him completely he was impressed

11. then he asked me questions in databases with increasing difficulty about 12-15 questions i answered then he asked me some indexes in databases which i don't know i told him the i don't know then he stopped asking about database

12. questions about java, c++, php. all are difficult ones. i answered 85% of them

13. i written sql in resume so he started asking queries normal ones only

how to delete duplicate records

one coln contains IDs from 1 to n one is missing in between them how to find it using sql

view points what are they, why, how to create.. etc

given 4 tables with sample data asked me to select some rows from one table based on joint of two tables which are results of one sub query with one condition. (it includes aliasing, join operation, sorting, and mainly logic. i thought for about 5 mints then i got the logic)

14. its been more than 90 mints so he thought to stop the interview he skipped to basic questions about me, my background, why oracle.. etc

and stopped the interview he told me that im selected for 4th round.

---

### 4th round

after 5 hrs after 3rd round i was called for 4th round

all are programming questions:

1. 4X4 matrix containing 1,0. 1-path 0- no path. starting point is given different exit points will be given find the shortest path

3. aqian about my 2nd round question and optimization techniques and another method to do it

4. coding round 2nd round 4 th question : input stream given find the missing number 99100102103104016 find the missing number here 10. i had already discussed it with my friend so i explained the logic he said ok

5. 5 numbers 4 operators are given find the max value possible

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

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## Oracle Interview Experience | Set 16 (On-Campus for GBU Developer Profile)

### Pattern:

1. Online Test (70 appeared, 43 shortlisted)
2. Analytical reasoning, coding round (Written) (30 shortlisted)
3. Technical interview I (16 shortlisted)
4. Technical interview II (finally 6 got selected)
  - Global Business Unit (GBU) Developer profile

### Online round: 2 Hours

4 broad sections containing subsections:

- Aptitude
- Verbal
- Reasoning
- Technical

Paper pen round : 1 hour

Puzzle: 2 questions

Code: 1 question

### Technical interview 1: 1 hour

by Senior Application Developer.

- Interviewer went through my resume and asked what you did as Tech Head and Maths sec.
1. Third year project. Challenges and future scope. (15 min discussion)
  2. Insertion sort, How will you optimize it? which sort is better for arrays and which for SLL.
  3. Explain various search techniques. He was looking for hash table ans Trie not for binary search.
  4. Difference between C and CPP, overloading and over riding.
  5. Explain containers: Hash Tables, map, multimap, set, multiset, Hashmap and hashset.
  6. some basic questions were on os, networking and web development.
  7. sql queries, Joins with ven diagrams. Difference between 3NF and BCNF.
  8. OOP concepts like polymorphism, Inheritance, virtual functions, RTTI, virtual Destructor with real life examples.

#### **Technical interview 2: 45 mins**

By senior manager.

Again Interviewer went through my resume and asked If I'll give you free time and all power what will you do.

1. Asked for dry run of written round code.
2. How you will store mobile no. of all the citizens of pune? I explained it using Trie DS, He asked me to write down code for it.
3. How will you search a man who died 500 years ago in Family tree, Root node was created 7000 years ago?
4. How will you implement queue using stack.
5. How you will check whether path shown by google map is correct or not, u can't use dijkstra's,
6. What you did as Tech Branch Head, Maths sec and House captain.
7. Which profile and city you will prefer for joining.
8. Anything you would want to know from us?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

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## **Oracle Interview Experience | Set 15 (On-Campus)**

I find GeeksforGeeks very helpful! It helped me prepare for my Oracle interview, thanks to the previous contributions by many.

#### **Oracle Campus Recruitment Process**

##### **Pattern:**

1. Written round
  2. Analytical reasoning round (Written)
  3. Coding round (Written)
  4. Technical interview I
  5. Technical interview II
- Pool interviews for Osmania University, CBIT and Vasavi colleges.
  - 7.5 LPA Pay package
  - Global Business Unit (GBU) profile

##### **Written round:**

106 marks – 120 minutes

4 broad sections:

- Aptitude
- Verbal
- Reasoning
- Technical

##### **Analytical reasoning:**

4 questions – 30 minutes

##### **Coding round:**

1 question – 30 minutes

Students whose performance was top-notch in analytical were directly sent to the interview round. I was promoted to the 4th round

##### **Technical interview:**

- One panel member
- Went on for about 45 minutes

Interviewer went through my resume and asked about my projects right away

1. Did you face any challenges with your project? If yes, what was your approach to solve it?
2. How did you optimize your code?
3. Do you plan to extend your project?
4. What else are you planning to include in your project?
5. Why did you choose Java for your project?

6. What are the OOP concepts (explained in detail for about 7 minutes)
7. Write a program to check if a given string is palindrome (Had to do a dry run of the code and explained its complexity)
8. Explain HashMap and HashTables
9. What are collection classes?
10. What is hashing? Explain various hashing techniques
11. What are collisions in data structures?
12. Explain various search techniques
13. What are the JavaScript concepts that are similar to Java?
14. What is Google Student Ambassador (GSA) Program all about? (I am currently the GSA of my campus; explained about it for 5 mins)
15. What all did you do as a GSA?
16. What technologies were used in your events?

Similar questions for asked for my other internships too

In between, I was asked to tell about myself and anything else I'd like to let them know, basically to avoid the void while the interviewer was thinking of questions.

#### **Interview II – HR + Tech.**

- Panel of 2 members
  - Went on for about 50 minutes
1. Tell me about yourself
  2. At which level do you play badminton (I mentioned in my previous answer that I play badminton)
  3. What is it that you like about yourself?
  4. What don't you like about yourself?
  5. What don't you like about others?
  6. How good are you in programming on a scale of 1 to 10? (I told 7 to 7.5)
  7. Write a program to reverse a string (Wrote and explained my code with a dry run)
  8. Asked more about Google Student Club, Technical events we conducted
  9. More questions about my marketing internship at Viber
  10. What is Big Data- Hadoop? (It was in my resume as I had presented on the topic)
  11. What's your favorite subject? (Java)
  12. What is multithreading in java?
  13. (Other interviewer) What's your favorite subject? (Data Structure and DBMS)
  14. DS: Given that you are standing on a floor in a building having 'n' elevators, design a system such that on pressing a button, the elevator on the nearest floor to that of yours arrives. Which data structure is to be used and how is it implemented?
  15. What is normalization in DBMS?
  16. Does 4NF exist?
  17. Difference between 3NF and BCNF?
  18. How to convert 3NF to BCNF
  19. Anything you would want to know from us?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

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## **Oracle Interview Experience | Set 14 (On-Campus for Server Tech)**

### **ROUND 1:**

This was an online round. There were three sections :

- 1) Aptitude and logic
- 2) Data structures(mainly binary tree),OS,DBMS,OOPS.
- 3) Data analysis.

### **ROUND 2:**

Online coding round:

2 codes:

code 1: given an array and a player. The player selects elements from array. If the player selects an item with value i the he/she cannot select i+1 or i-1. Find the maximum sum of value the player can select.

I/P : 4 1 2 8

O/P : 14

I/P : 9 7 4 5 6 1 2 3 8

O/P: 25

code 2: Find the number of palindromes that can be formed by jumbling the words of a given string.

I/P : abab

O/P : 2

I/P : none

O/P : 0

**TECHNICAL ROUND 1:**

- 1) tell me about yourself?
- 2) some questions on sorting algorithms? i.e, which sort is better and running times for each?
- 3) given a list of strings place all anagrams together.
- 4) Given two numbers represented by two lists, write a function that returns sum list. The sum list is list representation of addition of two input numbers.  
<http://www.geeksforgeeks.org/add-two-numbers-represented-by-linked-lists/>
- 5) What is virtual memory? Demand paging? and some basic questions on os.
- 6) Given a big file sort it? Big in the sense doesn't fit into memory.
- 7) what is register storage class?

**TECHNICAL ROUND 2:**

- 1) Why is OOP better than procedural programming? adv and disadv of OOPS.
- 2) Puzzle: Pirate one: Ten pirates discover a chest containing 100 gold coins. They decide to sit down and devise a distribution strategy. The pirates are ranked based on their experience (Pirate 1 to Pirate 10, where Pirate 10 is the most experienced). The most experienced pirate gets to propose a plan and then all the pirates vote on it. If at least half of the pirates agree on the plan, the gold is split according to the proposal. If not, the most experienced pirate is thrown off the ship and this process continues with the remaining pirates until a proposal is accepted. The first priority of the pirates is to stay alive and second to maximize the gold they get. Pirate 10 devises a plan which he knows will be accepted for sure and will maximize his gold. What is his plan?
- 3) Reverse a linked list.
- 4) <http://www.geeksforgeeks.org/a-linked-list-with-next-and-arbit-pointer/>

**TECHNICAL ROUND 3:**

- 1) Design the snake and ladder game and finally if three players play it must give me the winner? I was asked to write the code for it.(some optimisations then).
- 2) Gave me array : 9 16 7 8 25 95 23 11 and I was asked which sorting algo would be best to sort it and asked me number of iterations it will take?
- 3) Asked me to explain merge sort and was asked to write complete working code for it.

**HR INTERVIEW:**

- 1) Tell me abt yourself?
- 2) how were the interviews?
- 3) how was 2nd round better than first?
- 4) asked me abt my internship.
- 5) asked me abt my family,hobbies and etc.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview Experience | Set 13 (On-Campus)

**Round-I: for 2 hours**

This was an online round. The entire two hours duration was split into three sections and each section had three sub sections:

Section-I: This section was computer programming, Data Structures, Operating Systems (Basics) and Data Base Management System.

Section-II: This section was Aptitude and Logical reasoning part.

Section-III: This section was based on giving attention to details. To summarize this section, they give a large amount of similar data and ask to find a certain data from the whole bunch. You need to search through the document and search that data.

Each section was really tight and required a faster problem solving capacity. It was like Race against Time.

**Round II: For 30 minutes**

This was a logical puzzle round which consisted of 4 puzzles to be solved in 30 minutes. This was a faster round in fact.

Q1: Given a set of 5 words. Find the word in which if you pick any letter you could say how many vowels are there in that word.

Q2: A scenario of Tic-Tac-Toe game. Question was, finally who would win the game?

Q3: To find the house number. Given 3 conditions.

Condition1: If it divisible by 3 then it lies between 50-59

Condition2: If it is not divisible by 4 then it lies between 60-69

Condition3: If it is not divisible by 6 then it lies between 70-79

Q4: It was also a puzzle. I don't remember the question exactly. But it was a question on arrangement of people.

**Round-III: Coding round for half an hour**

Question: To find series of amicable numbers for 1 to 1000, both inclusive. For example consider pair (x, y). If  $d(x)=y$  and  $d(y)=x$  ( $d(a)$  is sum of proper divisors of 'a'), then (x,y) is called amicable pair.

**Round-IV: Technical Interview.**

The interview lasted for about 50 minutes. Some of the questions imposed by the interviewer:

What are dangling pointers?

Algorithm for Level Order Traversal.

How do we say that Strings are immutable in Java?

What is Java Virtual Machine and it's Uses?

Some questions on Sorting.

Swapping without a temp variable and also using XOR.

ACID properties in DBMS.

Some Basic Concepts from Operating Systems.

SQL Queries (eg: Find second largest number).

Any Question Regarding Algorithms, start by giving brute force approach first. This will give an indication to the interviewer that you are thinking. Keep asking questions to the interviewer so that he/she will give a clue to proceed. Also this will indicate even if you don't know an answer you are willing to learn.

#### **Round V: HR Round**

This was just for 10-15minutes. The interviewer was very jovial. He started off by asking, how was the day, had lunch etc and went to ask generic HR questions. Are you going for higher studies? What do you want to become in your career, in other words what's your career objective? Why do we have to hire you? What do you know about Oracle? Why did you choose this university for your B-Tech?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

### **Oracle Interview | Set 12 (On Campus for Application Dev Profile)**

This is not just my interview. But just gathered some questions asked to other candidates also.

#### **Round 1 –**

- 1) 25 Horses puzzle where you to find top 5 horses. Answer : 8
- 2) Two sand timers which measure 11,7 minutes. You have to measure 15min using those.
- 3) Given 4 pairs of socks one of each yellow,blue,black,green. You have arrange them in such a way that there are 4 socks in between yellow socks ,3 in between the blue socks,2 in between the black and 1 in between the green socks.
- 4) Given weighing scale. Find defective ball out of 27 balls in minimum number of comparisons. You will also have to tell whether defective ball is lighter or heavier.
- 5) 100 floors – 2 eggs puzzle.
- 6) 2 ropes which can be burnt in 20min each. Have to measure 15min using those.

#### **Round 2 –**

- Talked about resume,projects.
- 1) Reverse a string,number.
  - 2) Reverse number using recursion.
  - 3) Coin change – DP
  - 4) Given a string count all different palindrome strings possible of any length and from each and every permutation of given string. Ex: Given TACKLE – all palindrome strings of length 1,2,3... from TACKLE , ACKLET, CKEATL ,ETALKC etc.
  - 5) A 3x3 matrix with all distinct integers 1-9. How many combinations of matrix such that 3 digit number in first row when multiplied by 2 represents number in row 2 and when multiplied by 3 represents number in row 3.
  - 6) Repeating elements in a integer array.
  - 7) Left view of a tree.
  - 8) Given a sudoku (a 9x9 matrix) .In single iteration you will to tell if it is solved or not.
  - 9) Data Structure used for implementation of dictionary.
  - 10) Given 2 dates.have to find number of days between them.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

### **Oracle Interview | Set 11 (For Server Technology)**

I was interviewed recently and got through Oracle ST. I can't remember many questions but I will try to tell as much as I can.

#### **Online round**

This was a 90 minutes test in 4 sections

- 1) Quantitative Aptitude

- 2) English & Vocabulary
- 3) Data Interpretation
- 4) Technical (C/C++, Java, DS, Algo, OS, DBMS, Networking)

The questions were really easy. You just need to have some basic knowledge for CS concepts to attempt the 4th section

#### **Written Round**

Due to shortage of time on the day of interview, they asked one coding question to be written on a paper in 30 minutes and that would was to be discussed in 1st round. They didn't really care about the working code but wanted to know how you approached the question.

The question was:

1st line of input had some N numbers and next line had one integer. Using basic mathematics operations( +, -, \*, / ), you had to determine if the number in next line could be formed or not. If yes, print the combination. Else print not possible.

Case 1:

Input:

4,2,3

11

Output:

4\*2+3

Input:

1,1,1

1

Output:

1\*1\*1

Input

1,2,3

124

Output:

Not possible

Input:

2,5,7,3

-7

Output:

2-5-7+3

#### **Round 1**

- 1) The 1st question was the usual ice breaker "Tell me something about yourself".
- 2) Then he asked me to explain about the android app I had written in my resume. I explained him each and every thing in detail, drawing the flow of the app on sheet, explaining how the app connected to the server and triggered a php script. He was quite impressed with the app which I could see on his face.
- 3) Then he asked me to write the conditions to be taken into consideration while deleting any node from a tree on a sheet of paper.
- 4) He asked me if I had any questions for him. This is pretty important because it shows how much you are interested in the job. Ask some sensible question here.

#### **Round 2**

He asked me how much I was comfortable in Networks and asked me many questions.

- 1) How is a file transferred via ftp and how exactly does FTP work? How many sockets would be required for one file transfer? (I could not really get what he tried to ask)

2) What is the path followed if my system wants to connect to some given IP of another system?

3) What algorithm is used for garbage collection in Java?

4) IPv4 packet structure

5) How DHCP works?

#### **Round 3**

- 1) What is the difference between a graph and a tree?

2) Find a path between two given nodes in a binary tree. Write proper code for this. Also check if any of the nodes is actually present in the tree. (wrote the code to find LCA(lowest common ancestor) and print path from NODE1 – LCA – NODE2)

3)

```
main() {
    printf("hello\n");
    main();
}
```

What will be the output of this code?

4)

```
main() {
    fork();
    if (fork() || fork()){
        printf("heyy\n");
        fork();
    }
}
```

How many times "heyy" will be printed?

This round went more into discussion than an interview. The team was really chill and made me feel really relaxed during the round.

#### HR round

This was just a formality. It did not last even 5 minutes.

- 1) She asked me about my background.
- 2) Why should I choose you?
- 3) Why Oracle?
- 4) Any location preference between Hyderabad, Bangalore and Noida?
- 5) Any questions for the team? I asked if I could extend my joining date by 15-20 days ☺

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview | Set 10 (For Server Technology)

Hi all. I would like to share my experience about my recruitment process with ORACLE. Oracle procedure consists of.

- 1) Online aptitude Round
- 2) Coding Round
- 3) 2-3 Technical Rounds and 1 HR Round

#### Written Round (90 minutes)

The written round was common for Server Technology, Application Developer & OFSS profiles. It was an online round having the following sections:

- a) Quantitative Aptitude
- b) Data Interpretation
- c) English & Vocabulary
- d) Technical (C/C++, Java, DS, Algo, OS, DBMS, Networking)

The questions were of moderate difficulty. Some were tricky but easy and some pretty hard.

#### Coding Round (30 minutes)

The next round was an online coding round. One question was given and we were required to solve that question in 30 minutes. The languages allowed were C, C++ and Java.

There was no elimination in this round.

Based upon the performance in the above two online tests people were shortlisted for the interview process for different profiles.

#### Interview Round 1 (Tech + Project – 90 minutes)

This round began with my introduction. After that the interviewer asked me various data structures based problems and algorithms. He then shifted his focus towards sorting algorithms and asked the space and time complexities of each along with their pseudo codes and explanation in detail as to why one algorithm was better than the other . It is very important that you take into account all the corner cases and write the code as efficient as possible because precision is what the interviewer expects from freshers like us.

My projects were his next cynosure. He asked every infinitesimal description of my projects as possible. He asked the technologies that I used the shortcomings I faced and also asked me how I swamped them. After about 2 hours I was called for the next round.

#### Interview Round 2 (Tech – 90 minutes)

This round was mainly conducted to test my Object Oriented Concepts. Starting from inheritance to polymorphism to encapsulation everything was asked to me in detail expecting not only the concepts but also real life examples. Code snippets were also asked in certain places. This round also focused on my projects.

#### Interview Round 3 (Tech – 60 minutes)

This round focused on my puzzle solving skills. What they expect out of this round is smartness , swiftness and efficient solution. They also expect us to stick to our solutions and give them appropriate justification for our stand. After about 10 minutes I was called for the next round.

#### Interview Round 4 (HR – 30 minutes)

This round was mainly conducted to know about my interest in their offer and in my field (Computer Science). She read my resume completely and asked me about almost everything in it- my hometown, the details about my summer internship, my current rank (in my branch), my hobbies etc. Then she asked me whether I would try for other companies even after getting the offer from Oracle. I obviously said no with decent explanation. Finally she told me about some formalities about joining and location and if I have any problems with it, again and obviously I said no.

That was All !!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

## Oracle Interview | Set 9 (On campus for Application Development profile)

Online Round:

An online written round was conducted on mettl.com consisting of following sections:

1. General Aptitude – 15 questions
2. Logical Reasoning – 15 questions
3. Technical (All CS subjects) – 20 questions
4. English – 10 questions

Duration was 75 min and 53 members were selected for next round among 200 aspirants.

#### **First Round:**

Interviewer introduced himself and asked me the question "Why Oracle?"

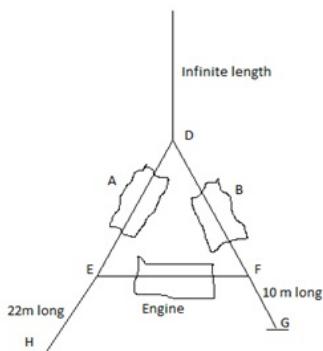
He then read my resume and asked me about the projects that I have done and about the things in my resume. Then he asked me to explain algorithm of the project that I'm going to do in the upcoming semester and asked me code it.

He asked me what my favorite subject was. I replied that it was Data Structures. He asked me few simple questions from DS like:

1. Implement queue using linked lists
2. Reverse a string
3. Find the number of palindromes in a big string.

Finally he asked me the following puzzle

He drew this diagram:



Engine is of length 12m. A and B are 2 bogies of 10m length each. Engine can turn only in obtuse angles but not in acute angle. For example Engine can turn as FEH but not as FEA. Now, the task is that I have to exchange the positions of A and B with the help of Engine and the engine should remain at the same place.

I tried for 15 minutes but couldn't solve this problem.

#### **Second Round:**

The interviewer went straight into questions. This is the toughest and longest round. I am posed with the following questions:

1. Explain interfaces in Java
2. What is overloading and what is overriding. Explain each with example
3. What are abstract classes in Java and what is the difference between an abstract class and an interface.
4. Find the fifth largest element in a linked list
5. Find the common ancestor of two given nodes in a tree
6. Explain heap sort
7. Find the duplicates in an array
8. An array of elements were given. You have to insert them into BST, Max Heap, B Tree
9. Merge two sorted linked lists
10. Explain three normalizations with example
11. Two SQL queries:
  1. Find the maximum salary in emp table
  2. Find the name and department of the employee with highest salary
  12. Difference between semaphore and mutex
13. PUZZLE: There are 25 horses and only 5 horses can be raced at a time and the top 3 are announced in each such race. What is the minimum number of races required to find the top 3 among 25 horses
14. How is undo operation (ctrl + z) implemented internally?
15. Explain 8 queens algorithm
16. What is time complexity of 8 queens algorithm

I haven't answered 12, 13 and 16 questions.

#### **Third Round:**

In this round I am asked both technical and HR questions.

1. Tell me about yourself
2. Explain your project
3. What is your favorite program and why is it so.
4. Write code for Towers of Hanoi problem
5. What are ER diagrams for?
6. Draw ER diagram for leave application of an employee in a department

I am not that good at DBMS. So I failed to answer the last two questions. I told him that I have more than 8 months of time before getting into Oracle and would concentrate on DBMS. He was impressed with my answers for other questions.

Then there was another round. In that round I am asked questions like "Is Hyderabad ok for you as work location?", "What's your email ID?" and then she explained me employee on boarding process.

Finally I am one among the 6 who got selected . Data Structures and Algorithms are the key subjects that helped me get this job. I should thank GeeksforGeeks a lot for helping me very much in my preparation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Oracle

### Oracle Interview | Set 8 (On Campus for Application Developer)

#### Online written Round:

Initially an online written round was conducted consisting of following sections:

1. General aptitude
2. Logical Reasoning
3. Technical (Basic C/C++ questions)
4. English

Overall time limit was nearly 2 hrs. It was an easy round.

#### Coding Round:

Then after this a large number of students were selected for the next coding round, where we had just one problem to code and time limit was 30 minutes. Problems were randomly distributed, it's just that coding interface was not that good so many fellow mates of mine faced problem getting the output to the console in the right manner.

I got the following program:

A number x supports a number (x+b) where b is the number of set bits in binary representation of x, like if x = 3 then x supports (3+2)=5 as 3 has 2 1's in its binary representation. Now you are provided with an array of numbers you have to print SUPPORTED if number is supported by any number if not print BLEAK else if there is an invalid input print 0.

After this round 77 students were selected for the interview rounds. A big panel of 9 members had arrived to conduct these interviews.

#### Interview Round 1:

1. Code :- A simple C program to reverse the words in a string , like if string is "Oracle @ App Dev", then it should become "Dev App @ Oracle"
2. Puzzle: – Two persons X and Y are sitting side by side with a coin in each's hand. The game is to simultaneously flip the coin till anyone wins. Player X will win if he gets a consecutive HEAD, TAIL however Y will win if he gets a consecutive HEAD, HEAD. Now you have to tell is the game fair or not.
3. Some DBMS questions like normalization, joins and composite key.
4. Code: – Given the value of a starting position and an ending position, you have to reach from start to end in a linear way, and you can move either to position immediate right to current position or two step right to the given position. You have the print all the possible path to reach from start to destination. (DP)

This round went for like 45 minutes, the interviewer was really nice and was giving certain clues in between to guide me.

#### Interview Round 2:

This was a long and scary round, it lasted for like 2 hours.

1. You are provided a CSV (Comma Separated Values) in file like E1:12, E2:32 etc. You have to generate a tree with maximum height 3 only with the given values in the following manner :

E is the root of tree having n nodes to E1, E2, E3 ... En. E1, have n nodes E11, E12, E13 ... E1n, this is how things go on second level. Similarly for E11 types of element will be modelled.

Restrictions : You can read file only once , you must take care of the fact that if E1 is not in file but say E11 is there you must not include it.

2. Provided a string a character and a count, you have to print the string after the specified character has occurred count number of times.

Ex: String: "This is demo string"

Character: 'i'

Count: 3

Output: "ng"

However, solving this one must take care of corner case when character is not in string or its not in string count number of times etc.

3. Design a website similar to bookmyshow.com for booking cinema tickets but it must be for a single location only which can have multiple theatres in it. In this he wanted me to design a basic rough GUI, relevant database tables and linking GUI to database and also showing the whole data flow in system. Site must also provide features like advance booking, user login, user registration, movie rating option, saving card details etc.

4. Puzzle: Given 10 coins, arrange them such that we get 4 different rows each containing 4 coins.

5. Puzzle: Given 4 coins, arrange them to make maximum number of triangles of the figure.

6. In the end he asked Database Normalization and all the normal forms in detail.

#### Interview Round 3:

It was a technical + HR round, the interviewer asked me about the previous codes that I had made in previous rounds. He was more concerned about the approach than code. Then he started questioning about the site I made in round 3 regarding how I will amend it if it has to go global to all type of customers. Then there were some basic HR questions.

Finally 3 students were selected out of total 77 students (including me ).

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# Oracle Interview | Set 8

Company Name : Oracle (Server Technology)

Oracle procedure consists of

- 1) Written Round
- 2) Coding Round
- 3) 2-3 Technical Rounds and 1 HR Round

### 1) Written Round (90 minutes)

The written round was common for Server Tech, App Dev & OFSS profiles. It was an online round having the following sections:

- a) Quantitative Aptitude
- b) Data Interpretation
- c) English & Vocabulary
- d) Technical (C/C++, Java, DS, Algo, OS, DBMS, Networking)

The questions were of moderate difficulty. Each section had a separate cut-off.

### 2) Coding Round (30 minutes)

The next round was an online coding round. One question was given and we were required to solve that question in 30 minutes. The languages allowed were C, C++ and Java.

There was no elimination in this round.

Based upon the performance in the above two online tests people were shortlisted for the interview process for different profiles.

### Interview Round 1 (Tech + Project – 45 minutes)

This round began with my introduction. After that he gave me the following problem to solve:

You are given a two dimension matrix of characters. You are also given a String (character pointer). You have to find whether that string could be formed in that grid. You can move in the following directions: namely right, left, up, down & diagonal (forward and backward). But you can search the word by moving in only one direction at a time (i.e. if after the first letter, the second letter has been found by moving right then the subsequent letters also must be matched by moving right only. You cannot change the direction.). I gave him my approach using the Backtracking algorithm. He said that he liked my approach and asked me to write the full working code. He was very helpful and gave me hints whenever I was stuck. After a few minutes I wrote the code in C++.

It is very important that you take into account all the corner cases and write the code as efficient as possible.

Then he asked me the different sorting algorithms that I knew and asked the space and time complexities of each.

Then he shifted his focus towards my projects. He asked me every minute details of my project. He asked the technologies that I used the shortcomings and asked me how I plan to overcome them.

After about 2 hours I was called for the next round.

### Interview Round 2 (Tech – 30 minutes)

This round also started with my introduction. Next he asked me that how would I explain Quick Sort and Merge Sort algorithms to a layman. He asked me the differences between Merge Sort and Quick Sort and which algorithm fits better in which situation.

Then he gave me a design question. You have to design a lift system with 3 lifts which can either be moving (up or down) or stationary. Whenever anyone presses the lift button then that lift should be chosen to move which reaches the floor in minimum time. He then extended the question to multiple lift requests and asked me to write an efficient code for the same. He gave me a hint to utilise the threading concept.

After that he asked some basic questions on OS and Networking like the difference between semaphores and mutex, process state diagram, difference between threads and processes, TCP, DNS etc.

After about 10 minutes I was called for the next round.

### Interview Round 3 (HR – 10 minutes)

This round was mainly conducted to know about my interest in their offer and in my field (Computer Science). She read my resume completely and asked me about almost everything in it- my hometown, the details about my summer internship, my current rank (in my branch), my hobbies etc. Then she asked me whether I would try for other companies even after getting the offer from Oracle. I obviously said no with decent explanation.

Finally she told me about some formalities about joining and location and if I have any problems with it, again and obviously I said no

After about half an hour, one of the interviewers came out and formally announced "YOU ARE SELECTED"

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## GATE CS Corner Company Wise Coding Practice

# Oracle Interview | Set 7

On line test consist of 4 sections analytical, quant, computer science and English.

### Coding on paper(45 min):

Based on scores they shortlisted for ST, APPS and Finance profile. myself shortlisted in ST profile.

On interview day

### 0th round(no elimination):

given 3 questions:

1. Given array of 14 integers and asked to build max and min heap pictorially.
2. Given array of integers and element find whether sum of any two elements equal to given number.
3. Given array of rotated sorted integers and asked to search for an element.

I completed these questions in 35 min and returned paper then immediately they called for interview.

#### **1st round(1hr30min):**

1. Difference between java and c
2. Questions based on above 3 questions (how you solved)
3. He asked me "given a big file and i want count of all words in file" define your own data structure for it and implement algorithm to it.  
Once implemented asked me to implement efficiently.  
For both algorithms time complexity.
4. Given around 10 sql queries i wrote the queries and then he given 2 tables and asked me the output for all the queries.
5. Given a complete binary tree and if you wants to insert a new element how to do it. I told him if tree represented in array representation then  $2i$  and  $2i+1$  concept.  
Then he asked me another way then i said using queue.
6. In both using array and using queue representation how you will implement max/min heap.

#### **2nd round(1hr):**

Completely on resume.

In detail explanation about previously done projects.

Questions based on oops concepts.

#### **3rd round(50min):**

Questions based on structures unions and structure padding.

He given array of elements and asked me to build binary tree, Binary search tree, avl tree.

Asked questions on all trees.

Then questions based on current project.

#### **HR round(around 15min):**

Tell me about your self which you did not mentioned in your resume.

Out of all the projects which you did which one you like most and why.

And job location priority etc.,

I hope this may helpful to some one. Thank you guys without your help i cant make it.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Oracle

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## **Oracle Interview | Set 6**

I was referred by a friend and all the interviews are held at Oracle office, Hyderabad. None of the expenses would be reimbursed by Oracle.

#### **F2F1: (1 hr) (With hiring manager)**

As i was working in Payroll team in my current company, lot of questions were asked about it. He made me explain whole architecture, write flow charts for important modules like pay calculation and income tax.

#### **F2F2:**

After all the discussion in the previous round, he wanted me to design a new payroll system using OOPS principles.

#### **F2F3: (Next day) (with a junior guy)**

This interview started with my general introduction and followed by 10 sql queries (he brought a sheet with all the questions) . The queries are simple involving date manipulation, group by, max value with out aggregates etc.

#### **F2F4: (with a senior guy)**

Started with general introduction and then income tax module of payroll.

He asked me to write a program to reverse a string , then he dived deep into Oracle database questions like how the null is different from other boolean values, truth table with null, handling of null values in aggregate functions, codd's rules, indexing, normalization etc.

(My interview with senior guy dint go well, then i was waiting out side while my hiring manager and this senior guy discussed for at least half an hour)

#### **F2F5: (With Director)**

He introduced himself , told about the joining formalities in Oracle and asked my current CTC and expectations etc. (I asked for 10 % hike)

He gave me question about time taken for a train to completely cross a bridge.

then a coding question about finding the longest palindrome in a string. (He insisted on coding before listening to my approach)

#### **Aftermath:**

They seem to consider me for their ERP product Oracle Fusion apps HCM as i have domain expertise in payroll. Offer letter of Oracle takes its own sweet time of 2-3 months.Meanwhile, I took interview with Amazon and made it.

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## **GATE CS Corner Company Wise Coding Practice**

## Oracle Interview | Set 5 (For Server Technologies)

1st there was a online assessment. Oracle finance and oracle server, both had almost the same paper..4 sections..

- 1) eng
- 2) apti
- 3) basic technical
- 4) advanced technical

It was pool campusing, so we were called to some other college.

There were 4 rounds:

**1) Technical round (20 mins)** – Reversing a linked list , level order traversal of tree, a simple puzzle was asked.

**2) Technical Round (45 mins)** – here a lot of question were asked.. Threading, paging (OS)

queries, join, indexing (DBMS)

B+ tree, loop in a linked list (DS)

String reversal using recursion

Other questions I don't remember yo be honest..

**3) Managerial round (20 mins)** – Asked about Object oriented programming, Networking(all basic definitions).

Then there was an informal discussion about the company, its products, etc.

**4) HR round (50 mins)** – it was a stress round. HR will cover every point in ur CV and grill you. Just be confident and keep smiling.

P.S. – if you don't know something, just say sorry sir..I don't know this topic..they will move on..

N if you get stuck while answering tat question..they will keep asking u questions on that topic..

Thanks a ton to geeksforgeeks. Without them, it would not have been possible for me to crack this one.

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.

## GATE CS Corner Company Wise Coding Practice

## Oracle Interview | Set 4 (On-Campus)

Pattern: written + 3 Tech Interview + 1HR

Type: Online

cgpa criteria: NO

### Written exam Modules: 2hrs (no -ve marking)

1. Coding skills(comprehension oriented)
2. Computer science knowledge (basic)
3. Software engineering aptitude
4. Written English

### Tips:

Try to get the oracle Questions from the other IIT's or NIT's , because it repeats the same.By the time IITD starts written's almost all NIT's placements get completed.

"Be individual and solve them"

### Round 1: (1hr)

1. asked algorithm of Towers of Hanoi problem with 3 piles.
2. Now he changed the no. of piles to 4 for the above question.
3. Discussed the time complexity and analysis of the above algorithm.
4. gave DESIGN question "suppose if there is traffic management system database ,then if it goes into the deadlock, what happens and design such system such that it resolves many problems ".No clear information was given and it's vague. So i explained it by using distributed system concepts. He was impressed.
5. Given an array of n integers(consider +ve and also -ve) ,find an sub array such that sum of that array s maximum.
6. aptitude: Two poles each of length 15 m are at distance d. A rope of length of 16 m is tied from the top one pole to the other. Distance between lowest point of rope and ground is 7 m. Find distance d
7. He asked me whether i know chess or not because he wanna frame a question on it. I said "NO :-p" then he skipped it.(but i know how to play chess)
8. Advantages of C language over C++ (really tough one ,as he was expecting 10 points)
9. Multi Threading , Multi Process and Context switching concepts(in depth)
10. code of Level Order traversal of binary tree and nary tree
11. Some silly Questions.
12. Major Project

### Round 2: (45 min)

1. he gave me the code of lengthy C# program and asked the output of it.
2. Same as first again.
3. He gave Aptitude question(some comprehension -5 questions)— very tough

4. Tortoise and hare algorithm

#### Round 3:(40 min -STRESS interview)

1. Asked Course projects and requires in depth details of it.
2. He gave some comprehension type of aptitude to solve 5 sub questions of it within 5 min.
3. Gave me a puzzle. I solved it by substitution method but he started scolding me saying that why couldn't you solve it generically. In case of my friend case, when he solved generically, he started scolding him saying that who said you to solve generically. So finally his intention was to make you feel more stressed.
4. HR related questions.

#### Round 4 :(30 min-HR)

Basic HR questions.

Try to make them feel like you will definitely join their company.

Source: <http://amarnath-iitd-placement-experience.blogspot.in/>

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Oracle

## Oracle Interview | Set 3 (On-Campus)

My on campus interview experience of Oracle Server Technology.

#### Online Round:

At first we had an online exam for shortlisting for final interview process. This round had almost everything from English to Puzzles. Basic computer engineering concepts to advanced computer engineering concepts.

#### Interview Rounds:

##### First Round:

At first the interviewer asked me to rate myself in C/C++ skills out of 5. And 4.5 was my answer. As he was impressed by my answer, he asked me to write bug free codes for following problems in C

1. Iterative post order traversal of a binary tree. (I gave him the answer with 2 stacks).
2. You are given a Single Linked List containing integer key as data in every node and a head pointer pointing to the first node, you have to delete a node with a given key, you can't create any new variable. (Copy data of next node to the node which contains k and delete next node).
3. You are given an integer array of size n containing elements in the range 0 to n-1. Now count the frequency of all elements.

##### Second Round:

Interview was started with the introduction, after the introduction he gave me some tips on how to give introduction by highlighting my interests and achievements so far.

After that we discussed my 3rd year's project for about 10 min.

The he said he is going to ask me just one question on some topics, If I succeed then he will move to the next topic. The question was::

1. You are given a square matrix containing 0 or 1 in every cell. Find if all 0's or 1's make a perfect square. I asked for some clarification on this question, then he said listen and understand at once, then he simply repeated the question and gave me 5 min to come up with an algorithm and left the room. He came after 5 min and I gave him the DP solution for finding max size square made by both 0's and 1's and in 2nd run I checked if there are 0's or 1's which are not part of those max squares. He was satisfied but he actually wanted a recursive solution.

2. Now the next topic was database. He gave me 2 tables and asked me to write outer join query.

3. Now in operating systems he asked me to draw process state diagram, I made a little mistake so he asked me to draw PCB, then why we need separate queue for both burst and I/O processes and finally how process queues are managed in multi core processor.

##### Third Round:

This round was puzzle round. I was given to solve 3 puzzles one after another after I solve the previous one. Puzzles were very simple math problems like=:

1. There are 8 members in family. 10 years ago the total age of all members was 'x', after 3 years a member of age 60 died and a new child is born. Again after 3 year a member of age 60 died and a new child born. Find the current average of age of all members in terms of 'x'.
2. Three cars A, B and C move with constant speed of 40, 60 and 120 kmph respectively. B starts 2 hours after A. Now A, B and C meet each other at same time. Find how many hours later C started from A.
3. In a exam there are 50 questions. +1 for correct, -1/3 for incorrect and -1/6 for unattempting.

Shyam scored 32 in that exam. Find the minimum number of questions he must have done wrong.

##### HR Round:

She gone through my CV, read each and every line. Then asked me to briefly explain my projects and the work I did during my internship. Then she asked about location preference and preferred joining date. After that I asked her 2-3 questions about company.

At the end of the slot I got the offer :). It was a great experience for me. Interviewers were very friendly except for 2nd round :P. To crack Oracle interview conceptual knowledge of various computer science subjects like OS, Networking (because of my project), Algorithms and Database is important. Thanks to geeksforgeeks for providing such a great platform to practice and learn various concepts.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Oracle

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### Oracle Interview | Set 2 (On-Campus)

Oracle Interview-Server Tech.

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Round 1:

=====

1. Explain Tree traversals. Given a inorder and postorder construct a tree
2. What is fork? How many total processes on execution of three fork statements. Justify your answer with diagram
3. What are JOINS in DBMS, their types and give examples.
4. Explain backtracking with example of anagram. Draw space diagram for that.
5. Explain quick sort and how it differs from other sorting algos with same run time complexity (like merge sort)
6. Write a program function for finding no. of levels in a binary tree.

=====

Round 2:

=====

1. Tell about yourself.
2. Explain your project.
3. The JAVA Story: Why java? the difference with C/C++. (Only conceptual, no technical)

He asked abt my perception of server tech and then he discussed what actually is being done in server tech.

=====

Round 3:

=====

A normal discussion round with HR, who wants to judge your commn skills, confidence, views, behaviour...etc. JUST be Yourself.

1. Likes, hobbies, fav passtime..
2. Why a year gap?
3. Give some feedback on our placement process.
4. Which part of ppt you liked and why?
5. Do you want to ask something. I asked abt after hiring process. He explained that you will get a mail from us regarding ur bckg verification. then project preference will be asked. At the time of joining you will placed in grp.. and will underwent some training.

=====

Finally HIRED!!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Oracle

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### Oracle Interview | Set 1

I attended the Oracle Server Technology interview at Bangalore. They started with a PPT followed by a written test. Then two rounds of technical interview and then HR. Finally result got declared after a week and got selected thank you geeks for geeks.

You are expected to write a algorithm/pseudo code followed by actual code in c/c++/java.

**Q1.** A tree is given, send it on a network. You can assume send() and receive() functions are available.

**Q2.** A compressed string is stored in an array of sufficient length. Write a program and its complexity to un-compress the string. i.e. a3b6c4 à aaabbbbbcccc

**Q3.** A media player selects songs from a database contains huge number of songs. Create a shuffle function such that it selects a song randomly but it does not repeat the songs. You can assume random function rand() is available.

**Solution 1.**

- a)Read the string in inorder and transfer it using send() and receive() function.
- b)Read the string in preorder and transfer it using send() and receive() function.
- c)At the receiving end inorder and preorder both are available so tree can be reconstructed.

**Solution 2.**

- a) First read all the frequencies and add them up as total\_freq.
- b) Start filling of array from index total\_freq.
- c) Repeat a character by the frequency given.

**Solution 3.**

- a) Enumerate the songs. Assign a specific number to each song.

- b) Write a map function which maps() the output of random() function to the size of song database (size).
- c) Play the song whose number is output of map function.
- d) Now scale up the sequence number of that song such that it moves out of range of map() function, i.e. seq\_no= seq\_no + size; (so that next time it can't be repeated until all songs have been played once).
- e) Once all songs have been played, again scale down their sequence number.

This article is compiled by **Shailendra Verma**. Many Many congratulations to Shailendra Verma. 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.

## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
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### Arista Networks Interview | Set 5 (On-Campus)

Arista Networks came to our campus. Initially, all the branches were allowed and the percentage criterion was 60%. But in the subsequent round, students from only COE, IT were shortlisted. For the next round we were asked to give our resumes and percentages. Students were then shortlisted based on these two. It was apparent that the percentage criterion was updated to 70-75% (as only the students having above 70-75% were selected).

The next round was online coding round on Hackerrank platform. 4 questions were asked ( 1 was very easy but the rest 3 were more of comprehension type and were relatively difficult ). Those who were able to do more than 2 were selected for the next round (PS: Only 4 were selected)

The final round was interview round. We got interviewed for 1-1.5 hours each. The interviewer asked us questions about DS and Algorithms. We were asked to write code and check it.

#### Interview Questions:

- 1) Tell me the differences between insertion sort and quick sort. When would we use insertion sort over quick sort?
- 2) If you are given a small pattern of bits which is to be searched in potentially infinite ,continuous text of bits. How will you search the pattern? Remember the text cannot be stored since it is potentially infinite in length and the bits are coming one by one.

Follow up question –

Now if the pattern length can be between 500-12000 bits. How will you do the above question in O(n) time?

(Hint – Think of pattern as int and compare it one by one)

- 3) How are files and directories organised in a Linux system? How will you implement it in C. Design a data structure for it.

Now you are given a parent directory in which new directory is to be inserted. How will you do it?

Write a search function for the above data structure that searches for a given directory in all the directories.

- 4) Questions on deadlocks, process synchronisation etc.

What do you know about Arista? What work do we do? Do you have any questions?

Finally 3 were selected amongst us.

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## GATE CS Corner Company Wise Coding Practice

[Interview Experiences](#)  
[Arista Network](#)

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### Arista Networks Interview | Set 4 (On-Campus for Internship)

Arista recently visited our campus for interns. There were three rounds in total. Initially students were shortlisted based on CGPA(8+). Then there was a primary online coding round following which there were two interviews.

#### 1. Coding round on hackerrank

There were three coding questions to be solved in 90 minutes.

Question 1. The question was based on ip fragmentation, where data length was to be divided into multiples of MTU(maximum transmission unit). Each fragment of data was to be structured as a node in a linked list.

(Difficulty – Easy)

Question 2. A snippet of code was provided and it was required to debug the code. No details were provided as to what the code does and what to expect. Solution dealt with altering structure pointers and node length.

(Difficulty – Medium)

Question 3. Add two linked lists and return the solution as another linked list.

(Difficulty – Easy)

I was shortlisted for the interviews along with 4 of my friends.

#### 2. Technical Interview

- \* Was asked questions regarding my approach towards the coding challenge. Discussed about code redundancy and recursive solutions.
- \* Was asked to give a real world application of circular linked list.
- \* Was asked to provide a data structure for string prediction as in auto fill in mobile phones. (Wasn't comfortable with tries, so implemented as a tree)
- \* Was asked about my projects(Luckily I did a project in networking in the 4th semester)
- \* Was asked if I had any questions( I asked about growth opportunities at Arista etc.)

The interviewer seemed pleased and satisfied.

### **3. Technical cum HR interview**

The second interviewer seemed a really jolly person. He asked me who took my first interview, and apparently I couldn't remember the name of my first interviewer or any of his features (I am really pretty bad with names and faces). I then asked if he had a pic of his colleagues and that I would definitely recognize the interviewer once I see him. He said that he might as well just have one and finally I was able to recognize the interviewer through the pic.

The entire incident left us in laughter and my nervousness vanished.

- \* Was asked to introduce myself.
- \* Deep discussion on the courses I took, and how my grades reflected. (I had secured a low grade in digital design lab and was asked particularly about it)
- \* Talked about my interests in Data structures, OS and networking.
- \* Discussion on my networking project.
- \* Discussion on threads and networking sockets.
- \* Was asked if I had any questions.( I asked about Arista's cloud based OS and why a single common platform image is better than OS for different devices with different chassis)
- \* Was asked about how I looked at myself after 2-3 years and my future plans.( I was honest with the answer and talked about working in an organization that provides me ample growth opportunities and working on projects that have real implications on the life of people)

The interviewer seemed content with my answers.

I would like to dedicate my success to the GeeksforGeeks team for maintaining such a vast repository of questions. Keep up the good work.

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Arista Network

### **Arista Networks Interview | Set 3**

I had an telephonic interview with Arista Networks couple of days ago. To apply for Arista Networks (Internship) CGPA >=8.5, luckily I had. Here are the details of the company's interview.

Interviews were done using Shared editor and phone .

#### **Round 1**

1. Tell me something about yourself ?
2. what do you know about arista networks ?
3. output of given program

```
void print()
{
    char s[10];
    gets(s);
    printf("%s",s);
}
int main()
{
    print();
}
```

4. How you can check whether a machine is 64 bit or 32 bit ?
5. Print number in reverse (descending) order in BST .
6. Delete a node in DLL .
7. struct hack , struct size .
8. Do know backtracking algorithm ?
9. What is DFS , BFS , which datastructures are used to implement this then he asked me to print BFS,DFS of a tree(t) i don't remember tree(t) .
10. Define OOP in 4 sentences .
11. Define Polymorphism .
12. Merging of list or array is good for if they are sorted , algorithm for merging of two lists time complexity of this algorithm
13. Following same question for array .
14. Following same question for array having the property as one array have enough empty space such that one array can accommodate another one , as like we have a[100] and b[40]; now we can accommodate b in a, assume we have 40 empty spaces in a.
15. sorting time of merge sort , heap sort , quick sort .

16. Define max and min heap, search time of heap.
  17. Define Normalization in database.
  18. Difference b/w C and Java
  19. Do you have any questions?
- Questions are not in correct order and some question may be from 2nd round sorry for that.  
Interviewer was very helpful.

#### **Round 2**

1. Tell me your interest subjects and grade.
2. How will you implement phonebook such that we can search using first name?
3. Following same question, How you will do if you have one more requirement as search with last name also?
4. Following same question if you have to search using phone number?
5. How can you show frequent calls list (list can have at most k items) for a phonebook?
6. Following same question, how you can solve if two or more calls have same count (and still maintaining k items only)?
7. Find duplicates in a file containing 6 digit number (like uid) in O(n) time.
8. Implement bitArray in C.
9. Why do you want to join our company?
10. do you have any questions?

I would like to thank GeeksforGeeks team for building such an awesome site and platform for interview preparation. After 4 days i got confirmation that you are selected for Arista Networks, feeling awesome.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Arista Network  
Arista Networks

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### **Arista Network Interview | Set 2 (On Campus Full Term)**

Lately, I had an on campus interview with Arista Networks. Here are the details of the company's written and interview process.

#### **Round 1 (Written, On paper, 10 Questions, 45 min) :**

1. Array indexing based C o/p question
2. Compute size of structure, Struct hack
3. Allocate m\*n 2 D array. The array should be accessible as arr[i][j].
4. Given a sorted integer array. Convert it to a balanced BST (Size of array is given)
5. Program to check whether 2 rectangles in a 2 D plane overlap or not.
6. A simple o/p question based on fork() (This question always comes in Avishkar and Mock exams)
7. Given an array of n integers which contains integers from 0 to n 1, with any of these integers appearing any number of times. Find the repeating integers in O(n).
8. Mutilated Chessboard Puzzle
9. Merge two sorted singly linked lists into one sorted singly linked list. Allocate no extra node.
10. Don't remember

#### **Round 2 (Tech Interview, 4 Questions) :**

1. Given a full binary tree.

Given the tree structure like this

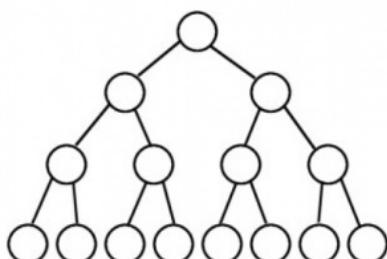
```
struct node
{
    int val;
    struct node *left, *right, *parent;
};
```

Root pointer is not given.

Given a pointer to node x (say 10) (indexing left to right starting from root as 1).

To reach node 10 from root, you need to move left, then right, then left.

#### **Full Binary Tree**



Return a pointer to the corresponding node y in the other subtree of root (if x was present in left, y should be found in right and vice versa) tracing same path sequence. For x = 10, y will be 14 [from root, go right (must search in other subtree always), right, left]. You are not allowed to calculate the size of the tree.

2. Given an integer N. Convert it into MS Excel column string.

Ex N = 1 : A

N = 2 : B

N = 27 : AA

N = 52 : AZ and so on

3. A router's table is given. There are 4 rows and 3 columns (Destination IP, Mask, Next Hop) in the table. Given the destination IP address of a packet. Determine its next hop. (Hint : Longest Prefix Matching)

4. Draw the states of a process in an OS

#### Round 3 (HR Interview) :

1. How did you come to know about Arista? (Tell them about the Google story)

2. Why do you want to join Arista?

3. A practical problem :

Given a project P. P has m modules (M1, M2, ..., Mm). Each module has some tasks (t1, t2, .., ti) where i can vary for each module.

There are E engineers. Assume that every engineer can do any task of any module. More than 1 engineers are allowed to work on a task simultaneously. Efficiency of each engineer for each task is given (No. of days it will take ith engineer alone to complete task tj of module Mk). Each task is atomic. So you start a task only when you know you can finish it completely without any pauses in b/w. There can be dependencies b/w the tasks too (Say t3 of M2 depends on t4 of M1, t3 of M2 cannot be started until t4 of M1 has been finished). You have to o/p the no. of days it will take to complete the project (Assume that wherever possible tasks can be run in parallel too). Design data structures to represent resources (Engineers, computer systems etc.), tasks and dependencies b/w them so as to minimise duration of the project.

Thank you geeksforgeeks for helping me throughout my journey

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Arista Network  
Arista Networks

## Arista Network Interview | Set 1

### Round 1 : Technical Interview

Question 1: Given a sorted doubly link list and two numbers C and K. You need to decrease the info of node with data K by C and insert the new node formed at its correct position such that the list remains sorted.

Complete working code with test cases was required .

Question 2: Given a binary tree , and two values a and b, find the shortest length between the nodes with info a and b.

Question 3: Basics of synchronization , test and set, locks, mutex. (wrote a code and kept on adding constraints ,asked if code would work in multiprocessor, uniprocessor, multithreaded system).

### Round 2 : C/C++ concepts + HR

The round began with detailed description of projects. Then, He went into the details of printf function, format string and variable arguments and asked to implement my own printf function.

Interviewer wrote basic C programs on shared screen and output had to be predicted.

Eg. 1 )

```
int main(int argc , char *argv[])
{
    printf("%c",**++argv);
}
```

Eg. 2)

```
int *x[N];
x=(int(*)[N])malloc(M*sizeof(*x));
printf("%d %d",sizeof(x),sizeof(*x));
```

Eg 3) Asked significance of return statement in C.

What does '0' in return(0) means.

Eg 4) Some questions based on pointing out errors in program

(eg. modifying read only string , concepts of constant pointer to string )

Eg 5) 10000 students are there and each student has one bit data. how can you modify his data in O(1) time .

Eg 6 ) Structure Padding details .

Eg 7) <http://www.geeksforgeeks.org/struct-hack/>

### Round 3 : Technical Interview

Question 1 : 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.

Question 2 : Suggest a way to search in sorted linked list in better than O(n) time . ( Skip lists )

Question 3 : LRU cache implementation.

Question 4 : Find the mean and median of the elements such that elements are dynamically added at runtime( only approach).

Finally, Why do you want to join Arista networks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Arista Network  
Interview Experience

## SAP Labs Interview Experience | Set 25 (On-Campus)

Hi All. SAP Labs visited our campus. The whole process was divided in 5 rounds :

- 1) Aptitude and coding round
- 2) Technical interview 1
- 3) Technical interview 2
- 4) Managerial interview
- 5) HR interview

The **aptitude and coding round** lasted for 70 mins. It consisted of 25 aptitude (maths + logical reasoning) questions to be solved in 25 mins. After this there were three coding questions.

First was partial coding, where some part of code was already written and we had to complete 2 functions. The question was to identify whether given 3 integers belong to an AP or a GP. The main function was implemented we had to implement the is\_AP or is\_GP methods.

Second was debugging round. A problem statement was given and its code was written, which produced improper output. In our test, there was an error in the shorthand "+" operator in the code.

Third was complete coding round. A problem statement was given and code for it was to be written. The difficulty level was moderate.

Platform used for this test was mettl.

They selected 27 people out of around 400 for interviews.

We got results and asked to attend the pre-placement talk and interview.

The **first technical interview** lasted for 1.5 hrs. He asked me to tell about myself and he was asking what are my hobbies and areas of interest.

After all this stuff he asked me what are the subjects in which you are good in, and I mentioned C, Java, DBMS, Data Structures and C++.

So he started the round with a java question which is regarding string and asked me to write a program where user gives many inputs and we have to concatenate some strings and return back, this was very simple.

He asked me difference between arraylist and linkedlist and I mentioned them, then he asked where will you use each of them in real life and I gave some examples for that, then he asked me what is hashmap and how does this work and all.

Then he asked how can we put three value in a hashmap and some questions related to that.

After this he moved to C and started asking questions from that

what is volatile, what is struct and union I answered all of them

Now he moved to data structures and asked me to construct a linked list and return only those nodes whose value is even.

After writing the program he gave an extension of that, we need to delete the node containing even values and we need to make a new linkedlist of only even nodes.

After writing program for both he moved to DBMS and started asking questions

like what is normalization and he gave a scenario and asked me to implement the same after implementing he asked me to write a query depending on joins and I wrote the query which is quite easy.

After this he asked me to wait outside so that hr will come and contact me.

I guess they didn't eliminate anyone after this round.

The **second tech interview** last for 40 mins. I explained about my project for 15mins and then they asked different questions regarding that and I answered all of them then they asked what are the mistakes you made in first round, I told them the mistakes I made and they asked me questions in DBMS and SQL query and difference between outer join and inner join how and when to implement and some queries on date in SQL. How to find if a loop exists in linked list and real life implementation of stack and queue, they were satisfied with the answers and asked me to wait for hr to contact me.

This time the **third round** was also technical it also lasted for 40 mins. He asked me in which language I was good in.

I answered it as C and he asked me to if I know what was palindrome, I was shocked to listen that question in 3rd technical round and I said I know what it is after that he asked me to write a program and I wrote it.

He told this is correct but don't use any in-built functions, so I took another array and wrote a program using that.

He said this is correct but I don't want to allocate any new memory and to write program without this. Then I wrote a program with this condition then he told this is correct and to write in as few lines as possible. Then I wrote a program in 3 lines he was satisfied and asked me to wait for hr to contact me.

The last round is **HR interview** she was asking many questions regarding my weakness and strengths, how do you see yourself after 5 years, what is your long term goal and you have been living in this city for these many years tell me what you like and what you dislike, why SAP labs, how many offers you have in hand, what are my hobbies and tell me about your family and some questions finally she asked me what would be my response if I am offered with tester position, I replied that I will be fine but I would be happy if I was offered developer position and they told that they will inform me later about that and he asked me what is the location I am interested in, I replied.

Then she asked me if I had any questions I asked some of them and asked how was my performance she asked to wait for results.

Then I was waiting for results with 3 others and finally we were called inside a hall and all the interviewers said "Welcome to SAPLABS". Finally they took 4 members

from our campus.

**TIPS:-** Never give up when a problem is asked just give a try if you are not confident share your idea with the interviewer he will help in deciding whether you are on a correct path or on a wrong one. Try to know how will you implement the data structures and different concepts in real life. The whole idea of the interviewer is to see how much you can push yourself and how much effort you give when given a question to solve.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 24 (On-Campus)

Hi All. SAP Labs visited our campus. The whole process was divided in 5 rounds :

- 1) Aptitude and coding round
- 2) Technical interview 1
- 3) Technical interview 2
- 4) Managerial interview
- 5) HR interview

The **aptitude and coding round** was conducted on 1st September 2016 and lasted for 70 mins. It consisted of 25 aptitude (maths + logical reasoning) questions to be solved in 25 mins. After this there were three coding questions.

First was partial coding, where some part of code was already written and we had to complete 2 functions. The question was to identify whether given 3 integers belong to an AP or a GP. The main function was implemented we had to implement the is\_AP or is\_GP methods.

Second was debugging round. A problem statement was given and its code was written, which produced improper output. In our test, there was an error in the shorthand '+=' operator in the code.

Third was complete coding round. A problem statement was given and code for it was to be written. The difficulty level was moderate.

Platform used for this test was mettl.

They selected 25 people out of around 130 for interviews.

The **first technical interview** lasted for about an hour. First he asked me to tell about myself. Then he gave me a puzzle.

There is a square consisting of 4 x 4 squares. So count total number of squares and come up with a formula for no. of squares in a n x n square.

Next I was asked to write an sql query to find id of second highest score in a table with ids and scores.

Third and final question of this round was, to reverse a single linked NULL terminated list in a single iteration of all the nodes.

About 10 people were eliminated after first interview.

The **second tech interview** lasted for about an hour and half. First he asked me to tell about myself. Then he asked me how my first interview was. He then asked me where should I start, data structures, databases, to which I replied anywhere.

He started asking questions about C. He asked difference between call by pointer and call by reference. Whether a function can be defined as void function(int &x, int &y);

Then he asked what is volatile data type in C. Then about the static data class.

He also asked me to write a program to find length of a string.

Then he asked about how functions in C work. How does the program know where to go back after a function is over, etc.

He then asked me if I knew C++, I said no. So he continued to ask a few questions on data structures.

He asked me to write a program to find middle node of a single linked NULL terminated list in a single iteration of nodes.

He then asked about the ACID properties which a good database must have. He asked how are transactions managed by a database, what are commits, how, in case of a power failure, data is reverted back, etc.

Then he asked a puzzle.

There are 25 horses. There are 5 tracks. So at a time, only 5 horses can be raced. What is the minimum number of races to be conducted to decide the winner?

Then he asked me whether I like to work individually or in a team. I said in a team. He then gave me scenario where I have to decide between a project I am working on, whose deadline is approaching, and helping a friend working on another project whose deadline is also approaching, and asked me what would I do in such a case.

About 10 people were selected for managerial round.

The **managerial round** lasted for about 45 minutes.

He again, asked me to tell about myself, what are my passions.

First he asked me how do I define a project, and what are the characteristics of a project.

He was going through my resume while listening to me. Then he asked which is the project of which I am the most proud of out of all those listed on my resume.

I mentioned one of them, which we did in second year. He asked me about the project and what I got to learn from it.

He then asked whether this project used any database. I said no. Then he asked me to draw a general architecture / data flow diagram of the software built in the project.

He went through my resume completely. He asked me about my internship.

The **HR round** lasted for about half an hour.

There were two interviewers. General HR questions were asked.

Then choice of location of work was asked, between Gurgaon and Bangalore, to which I said Bangalore.

They also went through my resume, asked my what my aspiration is, and what steps have I taken in order to achieve what I aspire.

Why SAP?

He then asked me whether I remembered the video they showed me during the pre placement talk. I tried to remember but could not so told him so. He was trying to confuse me by telling different things which were mentioned in the pre placement talk. I corrected him each time.

After each interview, they asked me whether I had any questions. I asked whether GNU / Linux is used at SAP, and whether openBSD is used on SAP servers / mainframes.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 23 (Pool Campus)

Hey guys, a pool campus drive for North-East India has been conducted by SAP Labs India in Guwahati, Assam.

The selection process is divided into 2 parts

#### PART 1:

Online aptitude test: 105 minutes

- a. Personality Test : 60 questions , 10 minutes
- b. English Essay: 1 question
- c. Design aptitude: 15 questions
- d. Testing aptitude: 15 questions
- e. Technical section: 5 questions & 1 debugging question
- f. Analytical aptitude: 35 questions
- g. Coding section: 1 question level 1, 1 question level 2

#### PART 2:

2 Technical rounds, 1 Managerial round and 1 HR round

##### Technical 1:

- a. What is run time and compile time?
- b. char \*str = {"s','t',' ','r','i',' ','g'}; WAP to print this without spaces.
- c. WAQ to select all employees who join in this month.
- d. WAQ to select all employees who are not working for any department.
- e. WAQ to select employee/employees having 2nd highest salary.

All the above questions are bit easy, give a try!

- f. how would you select the 2nd largest element of an unsorted array?

I told him first we sort the array, then we will get minimum and maximum at each end of the array, then change max = min-1 and again sort the array. Now the new maximum is actually the 2 maximum element of the array. Also I told the MOM( median of median) approach to find the k-th largest element in an unsorted array. he seems satisfied by my answer.

g. A long discussion on my project and internship.

h. What is object code?

i. WAP to check whether a link list is circular or not.

j. WAP to print this pattern :

```
+  
++  
+++  
--  
+  
+++
```

I solved this in 2 attempts, do not worry about the number of attempts, he will give you as many as you want, just do not give up and always give a try

k. what is union a derived type of primitive? if derived what is typedef? and is it necessary to use typedef in union?

Then he asked me , do you have any question for me, I asked him how was my performance, he replied with a smile, you will get to know soon

##### Technical 2:

- a. A brief introduction about myself.
  - b. In which language you are comfortable C/C++/Java or any other?
- I told i am comfortable in both C and C++.
- c. What is polymorphism and how it is achieved? With code and example.
  - d. What is segmentation and paging?
  - e. Are you comfortable with database? I replied yes, then he asked what is SQL Injection?
  - f. What is join and normalization?
  - g. Explain all forms of normalization and why would we do this?
  - h. What is abstraction and encapsulation? Explain with code and example.
  - i. What is difference between abstract and interface?
  - j. Rate yourself on a scale of 1 to 10 in logical thinking ability. I said 6-7

Then he asked me 3 puzzles, all are very simple and easy ones. E.g You have a gold bar with 7 marks on it, and you have piece of work , which would take 7 days to be finished and a guy will on do the work if would give him a piece of gold everyday. How many minimum cuts you need to cut the gold bar. i said 3, then he asked can

you minimize it, I said may be this is not the optimal solution but I could think of this only right now.

Then he asked me , do you have any question for me, I asked him how was my performance, he replied it was very good.

#### **Managerial Round:**

He begins this round with a puzzle.

You have 10 blocks and there are 100 apartments in 10 blocks. for each 5 blocks you have a bore well. Now suddenly there is increase in the electricity bill of both the bore wells, suggest some of the reasons why?

I told him that, as this is summer season , so there would be rise in temperature, he smiled and said yes ,you are going right. Then i said with rise in temperature, people will consume more water for drinking and watering purpose. He said yes this may happen , but it cannot raise the bill to a very much extent, think of more. I replied with various answers, then at last he replied, since it is hot, people will take more bath.

I could not give the exact answer but he was happy because i thought in a right way and was almost there.

Then he asked me about my family backgrounds, about my hardest time int the sappn of 4 years of engineering life.

Why SAP? What are your achievements?

About my strength and weakness and drawbacks.

Then he asked whether I am ready to work on any platform or not?

Then some discussion on my project and internship.

And at last he offered me juice and said It was nice meeting you

#### **HR Round:**

This round begins with a debate between 3 students (including me) on "Why make in India is not getting success". First they gave us 10 minutes of time to prepare for the debate and then the debate started.

All of us, came with very good points and the interviewer was very much satisfied with all of us.

After the debate we were sent to different cabins for our personal interview.

There she asked me about my family background, about my parents.

On which platform i would like to work( development/ testing/ support) and why?

I replied i would love to be in the development team as I am quite good with coding skills. Then she asked what if you were sent to some other team? I said I am ready work there also , as I am a good learner so i would get an opportunity to learn new things and can polish my skills.

Then she asked whether I am ready to reallocate or not.

And at last she asked do you have any questions for me? I asked how was my performance and can hope for some good news? She smiled and replied your performance was very good and we will you let you know whether you are selected or not.

TIPS: keep calm, never say no to any problem, always give a try. Interviewers are very friendly so interact with them as much as possible , and always carry a smile on your face.,

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **SAP Labs Interview Experience | Set 22 (Pool Drive)**

Hello guys, SAP recently conducted a pool drive for 2016 pass-outs. The first round was an online test which had questions from different sections like:

1. Personality test
2. Testing Aptitude
3. English Essay
4. Design Aptitude
5. Coding Skills
6. Analytical Aptitude

The test is for 105 minutes. There were 2 coding questions. The coding section has more weight age and second coding question has more marks.

The shortlisted students had face-to-face interviews. There were 4 rounds totally 2 Technical, 1 Managerial and 1 HR round.

#### **First Technical Round:**

1. Tell me about yourself
  2. Difference between C++ and Java
- He gave me an option to select any one language-C, C++, Java. I chose Java and he asked me many questions on Java.
3. Features of Java
  4. How does Java run a program
  5. What is Javac and Javadoc
  6. What is GIT
  7. What is composite and aggregation in Java
  8. Difference between arraylist and vector
  9. What is mutable
  10. What is exception handling
  11. What are checked and unchecked exceptions
  12. Difference between Interface and Abstract class
  13. What is static in Java
  14. Super and this usage in Java

15. Access specifiers in Java

Then he asked some questions on Software Engineering

16. Explain different models in software engineering process

17. Levels of CMMI

18. Some questions on testing

19. Difference between project and product

20. Which software model is best and why

Then he asked me to write code for a program to find 2nd largest number in an array

Next he asked me if u are given a chance to design a compiler for your own language what would you look into and how would you design it

Next a logical question- 9 balls weighing problem. In how many minimum chances would you find a ball with less weight where 8 balls weigh 100gms each and one ball weighs 90gms

#### **Second Technical Round:**

Tell me about yourself

He went through my resume and asked about my projects, interns and everything

Some questions on java like

Features of java

Explain polymorphism with an example code

Difference between method overloading and overriding and write a code to demonstrate this

What is linked list and write a code for it

Some questions on DBMS

A few questions on operating systems

#### **MR and HR Round:**

Take me through your resume

Why SAP and how do you think SAP suits you

What are your goals and how much time are you spending towards achieving them

What do you do in your free time

If you find someone in your team not working properly how would you handle such situation

If you are given a chance to change the world what would you do

Describe yourself in one word and why

What are the things you think you should improve

What does change mean to you

What would be your reaction if you were given an offer by SAP and what would you do if you were not selected

Then some questions related to my family

Are you willing to relocate to Bangalore

She asked me if I had any questions and I asked a few

And finally she said All The Best and the interview ended

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **SAP Labs Interview Experience | Set 21 (On-Campus for Associate Developer)**

### **Round 1: Online Test**

The online test was comprised of 107 MCQ questions including 2 programming codes to be done in 90 minutes. Platform used was Mettle.

There were 6 sections –

1. Psychometric test – 60 questions in 10 minutes

2. Logical reasoning

3. Data interpretation

4. Technical questions(C, C++, DBMS, OS, Computer Networks) – 15 questions

5. Analytical + quantitative

6. Verbal aptitude

and finally 2 coding questions.

Solving at least one of them is essential for getting shortlisted. It sounds like a lot but actually it's not. Give stress on codes, they have more weightage. Do practice following coding questions which were asked last year like

1. C Program to reverse each word of a sentence with starting letter to be in CAPS

Input: my nAME is john.

Output: Ym Eman Si Nhoj.

2. <http://www.careercup.com/page?pid=sap-labs-interview-questions>

Given a number recognize if it is bleak or supported by some number.

You need to only make function in both coding questions and run it against test cases.

Format would be like this-

```
// Assume following return types while
// writing the code for this question.
char* output1[100];
void bleakNumbers(int input1[])
{
    //Write code here
}
```

3. <http://stackoverflow.com/questions/19343509/number-of-possible-ways-of-assigning-free-plots-to-buildings-with-the-restrictions>

4. Find GCD of given 2 numbers

Additional Tips: Before appearing in actual SAP's written test, explore Mettle and give sample test on it. While writing test, don't think about googling because in case you try to go away from current tab, it will generate a red screen with a warning. So avoid clicking here and there. Give first priority to coding and give at least half an hour to programming. As soon as you see 1 hour remaining, attempt the MCQs.

# Around 850 students appeared in this round and 62 made it to the next one. (28 in R&D and 34 in consulting)

#### Round 2: Group Discussion

From here they divided students in 2 groups according to role. I was selected in R&D so here is my experience –

We had design thinking round to check our innovative skills instead of usual GD 'Swachh Bharat Abhiyan' was the topic in this round. We had to take interview of a customer (random guy), understand his needs and further design an application. After taking interview we were given 30 minutes to design 3 screens of our app on sheets. Then everyone was called for short PI in which we had to explain our design.

Additional tips: Prepare questionnaire very well before taking interview. Don't just ask interviewee but suggest your points too. Try to include as many as feature you can in your app. Presentation was the most important part so work on your presentation skills. Keep PI interactive and ask if they have any questions at the end.

#15 Out of 28 were selected for the next round in R&D.

#### Round 3: Technical Interview

PI – We had 2 Technical rounds.

##### Tech 1:

Interviewer started with common questions like:

1. Tell me something that is not on your resume
2. Projects- describe technical specifications. Then he jumped on some basic conceptual questions
3. What is a class and object in C++. Explain by taking an example.
4. What is method overloading? Give example
5. How is Encapsulation implemented? Give example? Write code
6. DBMS – Queries, normalization, ACID properties, joins, some question on data redundancy and inconsistency
- 7 Data structure and why do we use them. Give real life example of stack and queue.
8. I have an array of numbers from 1 to 100 (both inclusive). The size of the array is 100. The numbers are randomly added to the array, but there is one random empty slot in the array. What is the quickest way to find that slot as well as the number that should be put in the slot? He asked to write code and further optimize it and give one line solution.

Try it, it's easy!!

9. In the end he asked a simple puzzle to count number of squares of same size and derive a formula.

It went for 45 minutes and since we had a long talk on complexity so he asked me to give my time complexity I answered O(1) ☺

##### Tech-2:

In this round they were giving some scenario and we had to build and describe it. The interviewer gave me a scene similar to what we do on Flipkart.

Use Case 1: A user logs into Flipkart and selects products and adds it in his cart. Further add and delete items from cart and do payment. Now make class diagram, code with reference to user and administrator. I made class diagram and some code but I was not sure about it as I had never implemented such system so I asked him to change the scenario. Here he could have asked me to leave but he changed the scenario and gave me this one

Use Case 2: There is company named ABC and it is working on some old software. Sales guys of this company has to go and first sell things and then come back to update the changes done in the whole day now this company is thinking of including a mobile app through which sales person can update the data instantly being at customer location. Tell me how it can be done and what technology we can use. I had some idea about this and answered every question asked to me.

In the end he gave me a simple puzzle.

You have 3 baskets, one with apples, one with oranges and one with both apples and oranges mixed. Each basket is closed and is labeled with 'Apples', 'Oranges' and 'Apples and Oranges'. However, each of these labels is always placed incorrectly. How would you pick only one fruit from a basket to place the labels correctly on all the baskets?

PS: I knew the answer but I took some time and then answered him.

Tips: Be specific and say truth.

Don't rush in giving answers, take your time think and then give your answer.

If u don't know something just let him know clearly.

#### Round 4: HR Interview

PI – Managerial + HR

Basically they check your interpersonal and communication skills here.

My managerial round went for 1 hour and HR round for 1.5 hour.

Managerial Round:

1. Tell me about yourself, your family, schooling, role model
2. Why sap?
3. What is cloud? Private, public, hybrid?
4. Sap is focusing on becoming cloud player? What's your take on that?

5. Simple case study on cloud computing.
6. What innovations you have done so far.
7. I am giving you 5 minutes, present me an innovative solution and sell it to me
8. Latest gadgets, technology
9. Future plans

**HR:**

1. why SAP?
2. Strengths and weaknesses. Have you ever tried to make your weakness as strength? If yes, how?
3. Are you a team player? Give instances.
4. If you are leading a team and there are multiple suggestion how will u finalize the solution to a certain problem?
5. General talks about family, environment, college life, projects, and friends.

Tips: These were general questions so I would suggest to prepare them. Now sit in front of mirror and imagine yourself as interviewer and interviewee both at same time and let the both individuals talk to each other.

**General Tips and Advice**

Be calm and true.  
 Prepare well for interview.  
 Your 'Why SAP' should be very clear in mind.  
 They don't need hard core coders but ones having strong logical reasoning.  
 Start preparing soon, stay cool and give your best shot.  
 Last but not the least, google about SAP before appearing.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

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## SAP Labs Interview Experience | Set 20 (For Internship)

### Round 1: Online Test (105 mins)

The online test comprised of six sections –

1. Psychometric Test ( Time Limit : 10 minutes)
2. Coding Questions (2 Questions of 20 marks and 40 marks each)
3. Design Problems
4. General Awareness
5. Quantitative Aptitude
6. Testing & Debugging Questions

The trick is to solve at least one coding question successfully and not to skip psychometric test. In the psychometric test, same question can be asked in different ways again and again so you have to make sure you are giving same answer in each one of them.

12 students were shortlisted after this round for interviews. It took more than two months to start the interview process.

### Round 2: Telephonic Technical Interview (50 Minutes)

The interviewer was friendly and calm. She touched all the subjects I had learnt in my course. The interview started with "introduce yourself" question and it dove in the direction my introduction took it. She asked about my projects, my role in the projects, technologies used, if I was able to deliver on time ,what was my preferred method of doing it and why did I think that method is best. I mentioned in my introduction that I have a technology blog, so some discussion on that also happened.

Then the interviewer started testing my technical knowledge. Following questions were asked.

1. Error handling in C and C++
2. Web technologies used in industry
3. Debugging code
4. SDLC phases
5. Testing life cycle
6. Garbage collector and how it works
7. How to make a system secure

8. Collection package in java
9. OOPS concepts, whether OOPS is used in real world also? How is it useful?
10. Copy Constructors
11. Operator overloading
12. Macros
13. Calloc vs Malloc with example
14. TCP/IP
15. Different kinds of communication systems, the common challenges and how to face them.
16. Questions about online courses I had done.

The results of round 2 were announced after a week and the next interview took another week to happen.

### **Round 3: Telephonic Technical Interview (30 minutes)**

The interviewer asked me to introduce myself. Then he asked about my project, my role in it, what modules I developed, technology used, how many other people were there with me in the project. Then I was asked about Object slicing, dynamic/restrictive/static typecasting, inheritance, composition, difference between interface and abstract class with examples, virtual functions, difference between a project and product, SDLC phases, polymorphism, are C++ and Java fully object oriented, which language does not support multiple inheritance.

Then he moved on to some HR questions like

1. Why I chose the degree I am doing
2. What are my hobbies

Then he asked a guess estimate question that if there is a new restaurant in my locality having population of 1 lakh people, how many people can I expect in a day. For any number given, he asked the reason why this estimate only and why not other.

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## **GATE CS Corner Company Wise Coding Practice**

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## **SAP Labs Interview Experience | Set 20 (On-Campus)**

### **Round 1- Online Test (Time: 105 min)**

1. Psychometric test
2. Analytical Aptitude (Easy-Moderate Level)
3. Design Aptitude (DBMS+SE questions)
4. Testing & Debugging ( One code to debug: Calculate  $(a^b) \bmod n$  )
5. Essay (Inflation in India)
6. Coding Questions – 2 (1.Check each number for palindrome in a range 2. King Kohima's Problem)

### **Tips for Online Test:**

- Dedicate ample of time to the coding section, I was able to solve both the questions however people were selected for the next round even after solving only one question. If possible attempt the second question first as it has more weightage.
- Always attempt the Psychometric Test as some students were not selected because they didn't attempt the psychometric test even after doing very well in the paper. The psychometric test wouldn't judge you for right/wrong, it is just to test whether you are consistent with your answers. The same question may be asked in many forms and you have to be consistent.
- If confident about your Aptitude and Coding then you may skip the essay. Grammatical and spelling mistakes are big NO-NO in essay!!
- In the end the Online test boils down to a matter of speed and efficiency.

In the end a total of 15 students were selected from 180 for the next round.

### **Round 2 – Technical Interview (Approx 1 hour) Elimination Round**

The interviewer was very friendly and welcoming. He made sure I was at ease during the interviews. During the first 10 min he went through my resume very carefully and we had a light discussion about my interests/domains. I had pursued a Korean class and we had a jovial discussion about the Korean language and my reason of pursuing it. He seemed very content about my explanation. He then asked about my favorite programming language and I said JAVA and then I was bombarded with a stream of technical questions.

- Difference between Java and C++?

- If there are two machines, with same architecture, OS and every other things similar then would one compiled code of C++ run in the other machine?
- Difference between Abstract Class and Interface?
- 'Finally' keyword in Java?
- How does Java implement every concept of OOP's (Abstraction, Encapsulation etc)?
- Discussion about my project. I had done some Web Design projects. Lengthy discussion on Bootstrap Framework and Responsive Web Design.
- Discussion about my internship. Drew the schema of the database used and how I had normalized the database.
- Questions on SDE Models. What is the Agile Model of Development? He seemed very content with the answer!
- What is IoT? Some examples of IoT?

After the interview he asked did I have any questions. I asked about the feedback of my interview. He was very friendly and told me that there are actually were actually 4 rounds of interview. So it depends upon how you do in the next round. I asked "Sir I thought this was an elimination round". The only answer I got was RAW SMILE

#### **Round 3 – Technical Interview (Approx 1 hour) Elimination Round**

Unlike the last round, this was much tensed. The interviewer analysed my resume and started asking me questions about Web Development.

- Life Cycle of a Servlet? (Detailed discussion)
- Stateful and Stateless Server?
- Why is HTTP a stateless protocol?
- What are the advantages of stateless protocol?
- What is difference between Aggregation and Composition (OOP's)? ( I explained with a real life example, he was very content)
- What is Singleton class in Java?
- Write code to design a singleton class in Java. (30 min discussion on this, he helped me at many places, finally I was able to do it )
- Puzzle (A box of defective balls).
- What are some Web vulnerabilities? ( I explained about Man in the middle attack, DOS attack, Spoofing, Masquerading etc)
- Detailed discussion on SQL Injection (Code to protect against SQL injection, explained about Prepared Statements and Real escape strings).

This round was rather grilling as the interviewer was difficult to convince. However I was called for the next round.

#### **Round 4 – Managerial Interview (Approx 40 min) Elimination Round**

Very friendly interviewer !! Asked about my previous achievements and extra-curricular activities. Bit of discussion about every POR that I held previously. Asked why I prefer Java so much and would I have a problem if asked to work with other technologies. He seemed convinced by my explanation. Then we had a discussion about life at SAP and he explained what SAP Labs would offer me as an individual. Also a brief discussion about opportunities to work abroad in projects. ( I was told that Germany is a given, other countries depend upon the project you are in). How did you form a team and managed it for projects? How you handle a situation if a team member is not working in a project?

#### **Round 5 – HR Interview (Approx 45 min) Elimination Round**

There were two interviewers ( a lady and a gentleman), both extremely friendly.

They asked me to introduce myself. Asked about the motivation behind each and everyone of my projects. About my family and whether I was ready to relocate to Bangalore. Why do I want to work at SAP? ( I was well prepared for this answer, work culture, employee benefits etc.) Why don't you consider a MS from abroad given your strong academic record (I am a 9-9-9). I explained that I wanted to dive in the industry and later would think for a MS. They seemed convinced. We exchanged obligatory greetings and it was a great experience overall.

Tip for the interviews:

Keep only those points in the resume which you are absolutely confident about. In a span of 5 hours of total interview they shred each and every point down to tiny bits.  
Keep resume as simple as possible, never boast.

Finally a big thanks to Geeks for Geeks for helping me prepare for the interviews!!!!

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **SAP Labs Interview Experience | Set 19 (On-Campus)**

Hello friends, I appeared for SAP recruitment process in college campus. We were having online test.

There were 7 sections total – Analytical, Psychometric, Design aptitude, Essay writing, Software engineering questions(and debugging code) and two coding section. Out of 170, 36 were selected for the next round that was interview. In total there were 4 rounds of interview. All rounds were elimination round.

**1 Technical interview**– She asked questions on paging, deadlock, read – write locks, oops concept, some java questions about p.s.v main(), modularization, index, normalization and project. Interview was of nearly 45 minutes.

**2 Technical Interview**– This interview was more focused on coding. First, interviewer asked me language in which I was comfortable. I told him C.

Then he asked me many programs like to find occurrence of character in given string, write code of bubble sort. Then he told me now I need not to write the code just explain the logic. So he asked me to find middle node in given linked list in one pass (number of nodes not given, obviously), to find duplicate number in array (without using brute force approach), code of fibonacci using recursion. Then there were questions on design patterns, singleton class. He asked some output questions on data types and on method overriding in java. Then he asked two puzzles three switch three bulb problem and to identify lighter ball from given 8 ball using balance just two times. I solved both the puzzle. Then there were questions on MVC architecture, software testing, authorization and authentication, web services, projects.

This interview was of around 1.25 hr.

**3 Managerial Interview**– In this he asked about projects, software process models and real life examples, some innovative ideas, recent technologies, my experience in college, managerial skills I have and many more.

This interview was of around 30-35 minutes.

**4. HR Interview**– In this he asked about myself, why sap, what are my goals and more.

Tips- It's not required to give answers of all questions but you should answer around 70-80% questions, you should try till last to solve the question, and your attitude towards everything should be positive. Each interviewer took time to go through my resume thoroughly and then asked question. So prepare your resume well and write those things only which you know and have studied. Thanks and Best of luck.!!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 18 (On-Campus)

A written test was held, there were 6 sections in the written test. Time allotted was around 105 mins.

1. Psychometric Test 60 questions in 10 min.  
(after this we were able to switch between other sections so, 95 mins for others)
2. Analytical/Logical ability.
3. Design Aptitude. (questions required keen observation)
4. Technical (S/W engg ques., 1 debugging question was there, others I don't remember)
5. Essay Writing.
6. Coding section (2 questions, one easy and one with moderate difficulty. Both were solvable but time was less)

After that results were announced on 27th and out of 176 candidates they selected 36. Interviews were held on the same day. There were 4 interview rounds and each lasted approximately 1 hour. Students were getting eliminated after each interview.

**1. Technical interview:** First of all he asked me to wait for 5 mins outside, he went through my resume thoroughly and then called me in. He asked everything written there (seriously everything!!), so prepare your resume well). He asked questions on I think all the core subjects(Ds, Dbms, Cr, S/W engg etc). Also discussion of my projects in depth.

**2. Technical interview:** This one lasted a bit longer than others, I think around 1.5 hours. Interviewer was a lady. She asked some maths questions related to graph and asked me to find out the domain of Y in it(similar to what we used to do in 11th/12th class), then asked me to draw certain venn diagrams related to bitwise operators. After that some questions on "public static void main(String[] args)" (was trying to confuse me), and asked about garbage collector. Also questions on a situation she gave me (it was related to functionality of a hypothetical software).

**3. Managerial interview:** This was mostly focused on, (that's what I think), how is the body language, way of presentation, and communication skills. He also asked me to explain about my project and asked some questions related to latest technologies. He maintained a poker face during the whole interview (may be because he did not wanted me to know how am I doing).

**4. HR interview:** This was very good. He started asking hr questions and was looking for ideal answers but I simply said what I felt. At first I thought that's not the right thing but eventually it turned out to be good. Tip to clear this interview is to remain calm and think twice before you say anything and "BE YOURSELF", that's what I did. eg: He asked me why I am wearing shoes and not flip-flops ? I said because our TPO sir has set certain rules and if I did so then I'll be imposed with a 500 rs fine. ☺

It was really an exhausting day, interviews started in the morning of 27th and lasted till 1:30 am (yeah, 28th Nov). Finally they announced the results at 1:40 and 6 people were selected and I was one of them . But they couldn't take us for the dinner because it was already very late.

At last I have only one thing to say, if you are not able to answer anything just say "I don't know sir/ma'am", it is not compulsory to answer all the questions but you should be able to answer atleast 70-80% questions. Finally to make it through you must know everything about something and something about everything.

Thanks and All the Best...!!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 17 (On-Campus)

Recently SAP Labs Bangalore visited our college for campus placements. There were 4 rounds of Interview and Online Written test. Following is the procedure and tips how I got selected.

#### Round 1- Online Test (Time: 105 min)

1 Psychometric test (10 Minutes fixed time for this)

This test consists of very simple MCQs to judge your personality .Questions were like:

Do you like to talk to strangers? Do you freak out when things are not your way? How much interested you are in music?

2. Analytical Aptitude

Normal Aptitude questions on Time and work, Arrangements and simple time and distance , Direction Sense test.

3.Design Aptitude

There are questions like which type of watch ,purse suits for lawyers and other professionals. You can easily figure it out by looking at the images.

#### 4. Testing

Code is given and by looking at the code you need to check the code if the code is working accordingly or not. I would suggest to attempt it at last because it is very hard to predict.

#### 5. Essay

Topics like- Inflation, Social Network(Pros and Cons) , Information Technology.

#### 6. Coding Questions – 2

My questions were

1)To tell if the number consists of duplicate digits.

2)Bleak Number

At least one question needs to be solved to clear the written round. 36 were selected from this from 200 students.

### **Round 2 Technical Interview I (1Hr 30Min)**

She was very Interactive and was helpful too. Properly explained the questions and was a very good listener. She was cool and loved all cool stuff as she said.

1) Be Thorough with your resume each and every detail was asked. First she asked tell me something that is not in the Resume.

2) ER Diagram of Database Project was asked. Conversion to Relational Model. What you did in that project? Explanation Intended with good Technical jargons.

3) Client Server Architecture full details

4) How Internet Works and page request travels over the network (TCP/IP ) stack details

5) Program to print decimal to binary(Recursive and non recursive)

6) Every details of every project was asked.

7) A pattern was asked along with different logics for printing triangle star and rectangle.

8) It all depends in this round how good you know about projects and technologies.

9) Discussion on JavaScript, PHP

10) ACID Properties.

At last she asked some questions about family and profession of family. Do you have any questions and a firm handshake and over

After sometime I came to know about that I cleared First round and I waited for Second round. 18 Cleared this round.

### **Round 2 Technical Interview II(1Hr 15Min)**

He was Cloud Expert and mainly discussed on technology.

1) Tell me something that is not in your Resume

2) Why you have not included it.

3) What offers do you have from previous Companies.

4) Discussion on Agile Development, Android Applications

5) Career Goals – What you want after 4 years and how you are working on it.

6) How you see ads on Facebook(Do you know how it is done).

7) Program for finding sorting

8) Some SQL queries like Index Creation, Second max salary , Transactions and Serializability.

9) What is Operating system?

10) Virtual Memory -How it is implemented (Demand Paging), Size of swapped Partition.

11) Normal Questions – Does your family scold you? How you handle disagreements in group? How you handle Stress?

12)Discussion On Clouds.

At last asked for coffee or Sandwich which I denied. Any Questions???

I asked about his career at SAP and Promotion criteria at SAP. I cleared this round too.

12 cleared this round.

### **Round 2 Managerial Round(1Hr 15Min)**

It was Stress Interview. He was Very Surprisingly sitting and giving angry response. But he was actually good. This was Elimination Round .7 got though this.

1) Introduce your family. Where are you from and where you live ?

2) Any Achievements???To which I said I had told about offer from largest Consultancy.

3)Suggestions on any project for Development of Indore (Where I Live.)??

4) Why SAP if already Placed?

5)Maintain your cool in this Interview and Be as Innovative as you can!!

6) Project Ideas in good way with communication skills.

7) How you cope with arguing friends?

8)Some general behavioral questions.

Any Questions??? Firm Handshake and Over.

### **HR Round**

Simplest of all but most intriguing.

1) About Family.

2) Case Study:

A friend has cheated you with stealing your idea and he is your best friend for 16 years .How will you cope up with this.

Good Discussion was done.

3) Hobbies and Interests

4) Career Goals.

At Last 6 were selected.

**Some general tips are**

- >Be Honest and Verbose
- >Practice HR questions as well .They are asked in technical round also.
- >Be ready to learn any Technology and Never say No.
- >Speak as much as you can.
- >Don't bother if he is listening or not just speak your ideas. Don't get annoyed.

Be confident and be attentive in placement talk. SAP interviewers deeply check into resumes, so be quite sure on the topics you have mentioned. After the process, the interviewers took new recruits for a dinner.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

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### SAP Labs Interview Experience | Set 16 (On campus)

My interview experience was as follows:

#### Round 1- Online Test (Time: 90 min)

1. Psychometric test
2. Analytical Aptitude
3. Design Aptitude
4. Testing
5. Essay
6. Coding Questions – 2

Try out coding first as they carry more weightage and before attempting them read the compiler instructions carefully.

#### Round 2- Technical Interview (Time: 1 hr)

1. Difference between procedural and OOPs programming paradigm.
2. OOPs concepts.
3. Implement inheritance in C++.
4. Difference between structure and a class.
5. Can we implement polymorphism in a structure?
6. How to connect to a database in Java.
7. Is implementing individual connection better than having a common connection (a global connection variable) to a database.
8. ACID properties.
9. Explain about projects. (I have mostly worked on Web –Apps).
10. How to optimise a website, both in terms of front-end and back-end.
11. Explain the security factors to be considered for database.
12. What is SQL injection?
13. Explain branching in Git (as I had mentioned using git in my resume).
14. Convert a binary tree to linked list (use a most optimum type of list).
15. What is a friend class?
16. What is dynamic binding?
17. Explain different services of an Operating System.
18. Explain memory management.
19. Explain different keys in database.
20. What is primary key? How is it different from unique key?
21. Explain foreign key with example.
22. What are relations and attributes?
23. The interviewer gave two tables and asked the cardinality of relation.
24. Any Questions for me.

### **Round 3- Managerial Interview (Time: 45 min)**

1. Introduce Yourself.
2. Explain about your projects.
3. What are the problems faced by you during teamwork.
4. What are the problems you faced as a team lead.
5. What kind of people you don't like working with?
6. Asked about one the projects in detail.
7. Asked about co-curricular activities and other non-technical work from my resume.
8. Why SAP?
9. Any offers from other companies?
10. Any Questions for me.

### **Round 4- HR Interview (Time: 40 min)**

1. Introduce yourself.
2. Given a situation where farmers are committing suicide at a high rate use your technical knowledge to help farmers are reduce the rate upto considerable extent.
3. How would you design an alarm clock for a person who is deaf?
4. Do you like to write code from scratch or like to work on a code that already exists.
5. What is cloud computing?
6. Some casual talk.
7. Any Questions for me.

All interviewers were helpful and nice. Be confident and be attentive in placement talk. SAP interviewers deeply check into resumes, so be quite sure on the topics you have mentioned. After the process, the interviewers took new recruits for a dinner.

I would like to thank geeks for geeks for archive of previous interviews that helped me during the process.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

### **SAP Labs Interview Experience | Set 15 (On-Campus)**

My interview experience was as follows:

#### **Round 1 (online written test) approx. 120 candidates including MCA, B.Tech and M.Tech**

Total 103 question in 105 minutes

Objective question on-

- 1) Personality test
- 2) Verbal Reasoning
- 3) Design aptitude
- 4) Testing

And 1 essay writing and 2 coding questions. Coding question were easy but the platform was a bit tricky. 23 candidates short listed for interviews. Try to Attempt all questions

#### **Round 2 (Technical round) about 45 minutes**

- 1) Suppose There is a bottle. consider it as empty. now we are filling that bottle manually.

Now we have a large number of bottle to be filled. Automate this system. Design the system for this and draw a class diagram for this with attributes and functions.

- 2) Question on virtual table, virtual pointer, runtime polymorphism.

- 3) When does the virtual table gets created and how can we know this.

- 4) Question on copy constructor. Syntax and explanation.

- 5) If do not put const in copy constructor what will happen. Program will work or not.

- 6) What is the use of & in copy constructor.

- 7) When do we define copy constructor explicitly. Is it necessary.

- 8) From DS, doubly ended queue and quick sort.

### **Round 3 (Technical round) about 45 minutes**

- 1) Introduce yourself.
- 2) What are you good in?
- 3) What is MVD?  
I misunderstood it as MVC and said I don't know.  
then he said Multivalued dependency and i said yes ofcourse sir i know.  
difference between functional and multivalued dependency.
- 4) primary key, foreign key, candidate key, super key.
- 5) what is referential integrity  
I explained these using my project because i used these things in my project
- 6) He asked about my family background in between.
- 7) white box testing and blackbox testing.
- 8) SDLC
- 9) In which type of testing you have interest.
- 10) Then he asked me what is MVC. I again told him sir i don't know and i just know that it is "MODEL VIEW CONTROLLER"
- 11) what is cyclomatic complexity. how do we measure it.
- 12) what is flow graph. Explain with an example.
- 13) Normal forms. what is the difference between 2NF and 3NF.
- 14) Equivalence class testing.
- 15) Coding question on matrix.(easy one)
- 16) Type of relationships between entities in e-r. Explain how will you handle all of them.(1-1, 1-many, many-1, many-many)

### **Round 4 (Managerial Round) about 45min-1hour**

- 1) Introduce yourself
- 2) while designing a system, what will be your software development strategy (SDLC)?
- 3) Explain every phase of it.
- 4) If you have a BATA footwear retail shop. Design a backend system of it.  
I was confused in E-R and class diagram. Exactly what to design.  
So i did both of them applying SDLC.
- 5) What should be qualities of a good software.
- 6) What is a cloud.
- 7) Anything you know about SAP Hana.  
In between i asked him a question "I researched very much about SAP but didn't get the exact difference between the SAP cloud and SAP Hana."
- 8) If you have some work to do. But you want someone else to do this for you because you are a bit busy. So how you will get that work done.
- 9) What are the problem you face during any teamwork.
- 10) What is market analytics.  
Explain with an example.
- 11) What SAP exactly do.  
I said ERP, SRM, CRM.
- 12) Explain these terms.
- 13) what is hybrid and private cloud.
- 14) what are strength and weaknesses.
- 15) What motivates you to do good work.  
He was trying to make the interview informal but i kept the whole interview very formal.
- 16) Can you name some of the customers of SAP.

### **Round 5 (HR) about 30 minutes**

It was having the questions related to your personality.  
Have you been selected in any company yet?  
how many companies interviews have you faced till now?  
Why you were not selected in last company?  
Why SAP?  
General questions were asked and question related to teamwork and personal behavior and scenarios.  
Do you have any location preference?  
Your interest in: Development, Testing or Support?  
I didn't know what exactly "support" is? So I asked him, what it is?

At last 6 candidates were left after HR round. 2 MCA and 4 B.Tech and M.Tech  
They selected two of us.  
One from B.Tech and myself from MCA.  
Be clear with your basics and be a bit confident.  
Try to be interactive with the interviewer.  
And most important, Have a good knowledge about the company.

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## **GATE CS Corner Company Wise Coding Practice**

# SAP Labs Interview Experience | Set 14 (On-Campus)

SAP Labs On-Campus Interview Experience :

## Round 1 : (Online test) – 105min.

MCQs of Analytical (Circular/2 row seating arrangement ,Relationships etc.), Design Aptitude ,Testing Aptitude ,  
2 Coding Qs.

- (Any number  $x + \text{no.of active bits in binary representation of } x = y$  .Then  $y$  is said to be supported number and is supported by  $x$ .  
And if a number is not supported by any other number , then it is said to be bleak number.

Now given test cases of numbers ,you have to print whether a number is supported or bleak.

- Given some sequence find next missing number in it.

## Further rounds are Personal Interviews :

Don't remember the Qs round wise. So, writing questions asked in all rounds topic wise.

2 technical rounds were of 1.5hr and 1 hr.

Every round started with —

tell me about yourself, discussion on projects ..

- Design Mall database (ER Diagram) ... and then tables and gave me a query to write from tables i wrote.  
Told me that query can be made better for that normalisation has to be properly done. and told me to do it.Whole this design part took lot of time.Mean while asked about types of normalisation and explain anomalies.
- Students table , students in ABVP group , students in IEEE group. Given tables .... decide what are the attributes in each tables by yourself and write query to obtain students in both groups. attributes and query written should be simple and minimal.

After writing query , saw the join which i wrote and asked about inner,natural,outer joins.

- All SDLC Models ..
- Deep discussion on agile , XP, Scrum
- Java exceptions , Exception handling
- asked for throw -throws example with small snippet of code.
- throw vs throws and try catch.
- Start — tell me everything in OOP , dont pause in between till i say.  
— started telling him 4 concepts – abstraction ,encapsulation ..etc
- Explain inheritance to a layman with an example – not even one technical term was to be used.
- C vs Java
- Operator Overloading
- Constructor Overloading
- What exactly a constructor does?
- Copy Constructor.
- Access modifiers in java
- Example of private usage
- Finalize method
- What is garbage collection ? when do we perform it ? various techniques..
- Memory management in OS .. and need for it?
- A bit about virtual memory and paging.
- What is a Deadlock and conditions for a deadlock (4 conditions of deadlock mutex,hold nd wait,circular wait , ).  
How do you remove it? — told about deadlock avoidance , prevention... talked a bit about safe , unsafe states and techniques to remove those 4 conditions so as to eliminate deadlock.
- Heapsort , Bubble sort codes.
- Gave a sample set and asked which sort best applies on this.

then a quick discussion on merge vs quick sort – complexities. nd counting sort.

- Different linked lists and which to use when... applications of all  
– told everything about single ,double ,XOR ,circular ,stack ,queue
- Given SAP LABS INDIA code for INDIA LABS SAP
- Swap without using temp variable.
- Check for 2 strings are anagrams or not.
- A Systematic program to automatically switch on/off lights when person comes in/goes out.(Consider hardware implemented in a class).
- Box with silver , gold ,s/g ... labelled incorrectly .... puzzle -<http://www.techinterviewpuzzles.com2013/07/three-mislabeled-jars-problem.html>
- A confusing verbal statement about family tree – had to find number of girls in family – just understand statement and math equations were to be formed.
- Hot sunny day , a bridge with a car on it weighing 1000kg .Also bridge can weigh only 1000KG not even 1gm extra it breaks otherwise.  
A crow weighing 400gm comes and sits on it what happens?
- You with a car and three people ur lover, a old lady immediately needs to be in hospital , a best friend who needs to go to airport for a job interview in his dream company. All other people in city are busy in some strike – they cant be involved with you.

You have only one extra seat in car .Who would you pick up.

– Was able to solve it in 3rd attempt.

\*\*\* Note :: there is a optimal solution where all three members' requirements can be met.\*\*\*

- Three bulbs , three switches in another room – this was simple we all know. After solving this he tweaked problem a bit.

He then told me to thing as programmer who solves all corner cases ... and gave me a case where u don't know how many and which bulbs work or not..

#### Managerial round :

- Tell me about yourself.
- All you know about SAP.
- How many rejections till now?
- What is your Dream Company? Why?
- What do you like most about your college?
- Talked a bit about IITians , start ups ... start up vs other major companies..which one do u prefer? and Why ?  
Projects and leaderships – Asked if i was a leader for any project and asked what was my role exactly rather than just technical how else were you helpful for team?
- Picked up random words from resume and started discussion on it ....He kept prolonging discussion.

#### HR Round:

Asked where do you see yourselves in 5 yrs.

and then it was more of a casual talk about technologies, college life.

Definitely not a typical HR Round.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 13 (On-Campus)

I had SAP Labs first round on 10th Oct 2015(ON-CAMPUS).

The first round consisted of 15 logical reasoning numerical questions which were bit tough i felt as i never practiced apti (mainly consisted of relationships qns, people sitting around a round table who is beside whom(some thing of this kind qns 5-6).

One passage on RISING PRICES INFLATION .

10 Questions on picture viewing , like

1. given 3 bags picture, select the one which best suites a girl/lady for regular use ,
2. What is hidden in BASKIN ROBINS symbol(they will display symbol also) ans: a number 13
3. what can u see in KINGFISHER symbol etc...

4 questions on Software engineering(qns on water fall model , black box testing) and one testing question  
(i got it on quick sort).

Finally had two coding questions

1. Given {"hello","aaa","hi"} dispaly 1 if reverse of a string exists in the input else 0.

ans: here reverse("hello")="olleh" which is not in input , so display 0

similarly for "aaa" , u should display 1.

2.i dont remember the question , but logic was easy. given 4 as input find its factorial i.e, soln=16

now do soln = soln - 1;

finally display soln\*soln;

The people who solved more than 1 and a half codes got shortlisted for developer interview and the people who solved less than 1 code got shortlisted for consultancy.

Note:The have their own compiler, so dont worry about complexity just solve it.

After two days had interviews.

1 F-F Interview: (technical)

No introduction nothing , directly asked

1.storage classes in c and explain

2.many questions on pointers

3.switch statement questions

4.program to display reverse of a number by not using the instruction rev=rev\*10+rem ;

ans: just display remainder each time and divide by 10 till number becomes 0

5.features of C++ and explain

6.write a program to keep track of number of objects created

ans: use static variable and increment in constructor

7.program on function overloading in c++

8. wap in c for given INDABCINDAKLND as an input string stored in singly linked list , whenever D and A is found immediately in a string , insert I in between D and A.

---

2 F-F Interview: (technical)

- 1.introduce urself
- 2.Explain the features of OOP

3.Many questions on abstract classes and interfaces , like why is interfaces needed and explain with real time example  
4.If input string is ABCDJKCBJ and char is B, wap to to display two strings i.e,one string left to B and other right of B  
ans:

AC  
CJ

5.Given a array as input lets say A={1,2,-4,-1,0,5,-7,0,3,0} find the subarray with product of all numbers is max.

ans: sort it first {-7,-4,-1,0,0,1,2,3,5}  
sub array is {-7,-4,1,2,3,5}

6.Explain bubble sort

7.Many questions on data structures as my project was based on DS.

8.Explain one of my project

---

3 F-F Interview:

1. Design a database of Dell which customizes the products
  - 2.Few queries on it
- 

4 F-F HR:

- 1.Introduce urself
- 2.have u ever worked in team
- 3.whether u wish to work individual or in team and why??
- 4.what will u do if u have conflicts in your project team?
- 5.Few technical questions to check my confidence level , like which among C , C++ and JAVA is faster and why?  
why C is used in implementation of OS even though its not as secured as C++ and JAVA?
- 6.Explain linked list to a lame person.
- 7.Do u have any other offers , if so why will u join us.
- 8.A puzzle , a bat and a ball together costs 1 Rs 10 paise , and a bat alone costs one Rupee more than ball ,then what is the price of ball(with out using pen and paper).

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

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## SAP Labs Interview Experience | Set 12 (On-Campus)

Round 1: Online Test(1hr 45 min)

Psychometric Round : 60 question 10 min

Section 1: Logical reasoning questions.  
Section 2: Testing Questions.  
Section 3: Technical + Software engineering Questions.  
Section 4: Two Coding Questions.  
Section 5 : Essay Writing

Pro / cons of Social Networking site

**Code 1:**

Find out the sum of all digit from M to N (both inclusive)

```
Input
M=1 ,N=10
Output
46 (1+2+3+4+5+6+7+8+9+1+0)
Input M=10 N=15
Output
21 (1+0+1+1+2+1+3+1+4+1+5)
```

**Code 2:**

Convert the string into special string.

```
Input  
Hello There  
Output  
Oleh Ereht  
Input  
How are you?  
output  
Woh Era ?you
```

After this round they have shortlisted 36 students from various departments.

I was one of them ☺

They gave us a form to fill and give it back to them with resume.

Try to give as soon as possible, because it will decide the order in which sequence they will call you for further process

I was the second person to fill the form , but they called me first for the interview ☺

### **Round 2: First Technical (F2F)**

Que1:

Tell me about yourself, Family Background.

Que2:

Various Differences between C and C++

Que3

Ask C++ concepts (inheritance, Abstraction, Polymorphism, Encapsulations etc )

Que4:

What is process/project/program/product, explain them with differences.

Que5:

He asked me that do you any SDLC model, I Said yes I know spiral model, waterfall model. Then he asked me explain these model and write down the all the phases of SDLC and explain.

Que6:

Some questions related to inheritance, how we can assign the object value of subclass to superclass.

Que7:

He asked me that weather I have heard or know about manifications, I said no,

Que8:

He asked me to explain the project, just overview .

Que9:

Then he asked me a puzzle. I got a normal puzzle but some of my friend got the tough puzzles so go through the important puzzles.

Que10:

He asked me to ask any questions, but I don't have any question at that time.

### **Round 2: Second Technical (F2F)**

My First technical round was very good so I was called just after 10 minutes for second technical round.

This round is varies upon the interviewer. Some of them asking DS and some of them asking only DBMS / SQL.

I got DBMS/SQL Panel ?.

Que1:

Tell me about yourself , Family background .

Que2:

Then he asked me explain my project. I have two project in which one is LIVE PROJECT , so he was interested in live project, It was a project of Electric Maintenance Department of Our college. I explain all the aspect of the project.

Que3:

Then he asked me to explain all the modules of the project, I explained them all the Roles and Modules of the project.

Que4:

What is ER Diagram, Draw ER Diagram of your project with cardinality associations.

Que5:

Then he asked me some SQL query

Top 5 user who are frequently registering the complaint.

Top 10 User with required inventory

2nd Highest user who register the complaint.

Top 5 user with required inventory in Year 2014.

some more (Total 8 -9 ) query related to Group By Order by and Aggregate function. I was able to solve 5 -6 ?

Que6:

Then he asked me what is Data structure ,what are the different Data Structure. Some differences between them.

Que7:

What is stack.

Write a function to Find out Nth peeped Element using only push and pop.

I explain him that I can used linked representation of Stack and find of kth element from end but he is not satisfied,

Then I said I can use other stack and find out nth Element , we discuss on this topic apporx 20 min.

Que8:

Then he asked me what was your subject in UG.

Que9:

What is TREE, why it is being used. Explain all the traversal .

After this round I was sent to 3rd Round, within 5 minutes.

### **Round 3: Managerial Round**

In SAPLabs team there is person who is Asia specific Head ( I am not sure about this ) who is taking only Managerial round .

Que1:

He asked me tell me about yourself ,family Background .

Que2:

He asked me that if a client is facing a problem in accessing the detail of sales department, but process is very slow then how can you make it faster .

Que3:

Suppose my laptop is working is slow, so what are the steps you will follow to measure or increase its speed.

Que4:

What are the latest trends in world, and why ?

Que5:

What is Cloud and why it is good. Do you work on any Cloud. I said yes I worked on Amazon EC2 . Then he asked me what is this EC2 and where do you used this one.

Que6:

Why you choose BCA and then MCA over Btech?

Que7:

He asked to If I ask any question. so I asked 3-4 question.

### **Round 4: HR**

Que1:

Tell Me about yourself.

Que2:

Why you choose MCA not Btech?

Que3:

Family Background and family business.

Que4:

What is your strength and weakness?

Que5:

Explain Project (overview of all project).

Que6:

What do you learn from a team (as I said to them that the project Is a group project ) .

Que7:

Some common HR question like if you are having work of 10 days and you are having only 5 days , how will manage.

Que8:

Then he asked me some question upon Politics .

Que9:

He asked me ask any question , I said I already asked the question in previous round.

### **Tips:**

Round will be easy.

Basic knowledge of all subject.

Ask questions to them if they allow.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **SAP Labs Interview Experience | Set 11**

Hello everyone, I like to share my interview experience with sap labs.

Round 1:( Online Test)

\*\*\*\*\*

Section 1: Logical reasoning questions.

Section 2: Testing Questions.

Section 3: Technical + Software engineering Questions.

Section 4: Two Coding Questions.

Round 2: (Face to Face Technical Interview)

\*\*\*\*\*

Interview was very friendly first he made me comfortable than he started asking me questions.

1) Tell me about yourself other than I have mentioned in my resume.

2) Steps of Compilation

3) Difference between interpreter and compiler.

4) Discussion on project.

5) Multithreading in C.

6) Questions related to error handling in C.

7) Garbage collection.

8) Friend function and Friend class – he was giving me different situation and asking me what will happen now.

9) If I have two options available a Cloud storage and a hard disk or any other storage device which I will choose to store data and why.

\*\*\*\*\*

This was the best interview I had, I enjoyed a lot.

Round 3: (Face to Face Technical Interview)

\*\*\*\*\*

This was very short round, Interviewer was not giving me time to think, he was expecting answers very quickly.

1) Complexity of insertion, deletion of an element in array and in many situations he was asking complexity.

2) A Database Design Question –

Consider a campus recruitment process in which a particular company can visit my colleges and many companies can visit a particular college so, design a database for this using tables.

3) Difference between private and protected.

4) Code for Runtime Polymorphism.

5) Many OOPS related questions.

Round 4: (Managerial Interview)

\*\*\*\*\*

1) Tell me about yourself.

2) About family background.

3) About project I have done.

4) What is cloud.

5) Do you have any problem of reallocation.

6) Is it alright that we will give you more work to do.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
SAP Labs

### SAP Labs Interview Experience | Set 10 (For Developer Specialist, 4-6 yrs)

This was for a Developer Specialist (JAVA,JAVASCRIPT) position(4-6 yrs). It was a very long process but was an awesome one!!!

#### Round 1 (Telephonic) [ > 1hr ]

1) Why main method is void in JAVA?

2) Are string parameters mandatory in main method? At what time are the parameters read?

3) Difference between sleep and wait

4) Difference between yield vs join

5) Checked and unchecked exceptions.

6) Concurrent hash map.

7) Difference between isInstance and Instance of

8) When to use reflection and name few methods?

9) Fail fast vs fail safe iterator

10) JVM JRE and JDK.What does rt.jar contain?

11) When to use LinkedHash Map and Tree map? Which is better for insertion, deletion and search?

12) What is static method? Where are static variable stored in memory?

13) JAVA memory model.

14) JAVA garbage collection process.What is survivor space?

15) When to override toString() method?

16) Design a DS which does the following operations:

1) Insert, 2) Delete, 3) Search in O(1) complexity.

Few general questions about my previous experience.hobbies etc

After 3-4 hrs I got an update that I am through the telephonic screening and have to attend F2F.

### **Round 2 F2F( 90 min)**

After introduction,few questions were in JAVA then he started asking some coding questions.

- 1)Write a recursive program to find distance between 2 nodes in a binary tree.
- Modify it to know the difference between parent and the root.
- 2) Write a program "isPerfectSquare" without using SQRT, \* and / operators.
- 3) Write an infinite stack for doubly linked list.
- 4)How to design a chess board? ->The discussion went on for almost 30 min.The solution was an incremental improvement and the interviewer seems to be very satisfied.

### **Round 3 F2F( 90 min)**

- 1)What is strategy pattern? Explain and implement it.
- 2)What is Dependency Injection?Which pattern supports it?
- 3) Explain heap sort end to end with an example. Implement executable code for it.
- 4)DeadLock,Race Condition,Mutual exclusion.
- 5)Write a JAVA program to implement deadlock.Resolve it too.

### **Round 4 F2F( 60 min)**

**This was pure design round and was quite challenging.**

- 1)How to create REST API for a job scheduler?
- 2) When to use IS-A and when to use HAS-A relationship? Difference between Composition,Aggregation,Association,Specialization,Realization,Generalization.
- 3)Design REST API for checkout option in a shopping cart and what is the API designed to generate the Order ID
- 4) 1 JOIN query in SQL.

### **Round 5 F2F(90 min)**

- 1)Write an SQL query to remove duplicate rows in a table.
- 2)Draw a UML class diagram for a FILE/FOLDER structure.
- 3) Implement OR and AND operation using Conditional operator.
- 4) Find the nth largest element in Binary Search Tree (Sol :Traverse inorder n times)
- 5) Construct a binary tree for Infix expression without using stack.

### **Round 6(90 min) (Techno-Managerial Round -F2F)**

- 1) some puzzles
- 2) explain about project.some indepth questions on it.
- 3)How has quora implemented its architecture.
- 4)How is friends of friends feature implemented in Facebook?
- 5)What are the best ways to design REST API?
- 6) Few details about background ,SAP etc

### **Round 7(45 min) (Techno-Managerial Round -Telephonic)**

- 1) How is hash map implemented in JAVA?
- 2)Why have column-oriented databases evolved?Explain it.
- 3) Few more questions on JAVA.
- 4) Some behavioural questions giving a hypothetical situation (tricky)
- 5) Biggest challenging task I have done till now technically.

### **Round 8 ( HR -telephonic)**

- 1) What are your strengths and weakness?
- 2)Why SAP?
- 3)Notice period.
- 4)Expected Salary.

### **Tips:**

- 1)Questions in this firm are not that difficult like Amazon and other firms but the subjects covered are broader than what other companies ask.(Not limited to DS and Algo)
- 2) Even though you are proficient in many topics/technologies as mentioned in your resume, the interviewer would give you an option to choose the topic of your choice.
- 3)No on is perfect !!! All the interviewers were very helpful and were giving tips/clues during the problem solving.Please ask if you need more details about the question rather than keeping mum.Aall All the best Folks

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## **SAP Labs Interview Questions | Set 9 (Fresher)**

The 1st round was an Online Test. It consisted of 107 questions (60- Psychometric Questions) and the overall time limit of 90 minutes. The level of difficulty was moderate. The last 2 questions were coding (Tip: These carry more marks so solve them first).

### **Round #1: Technical**

The interviewer was looking like he was in early 30's. He started by asking to introduce myself. He went through my resume and asked how much will I rate myself in C and C++ in a scale of 10, I said 6-7.He asked the following questions:

- What is a class and object in C++. Explain by taking an example.
- What is static and use of it? Give a real life example where you would use it?
- What are public, private called in C++( ans :Access Specifiers) , What is the use of them? For whom would it be useful users or developers?
- What is difference between authorization and authentication?
- Abstraction and encapsulation?
- How is Encapsulation implemented and an example?
- What is use of inheritance?
- Write a program to find second largest number in an array?

Note: I just wrote a code to first find the maximum element and make it zero then again find the max from remaining(which would give second largest number)  
He asked whether this is the best solution , I Said No, this is the first solution that would strike anyone and we can improve its time and space complexity

9. Then he asked about time and space complexity?

10. Finally any questions for me?

He said it was good to have u and I answered most of the questions, the thing is that u don't need to have the exact answer its about how u get to a solution and how u think u can improve yourself Thank you.

#### **Round #2: Technical**

The interviewer introduced himself, he was working with SAP for 13 years and was about 50, The moment I saw him , I became nervous. He said I don't want to ask anything about programming as u have answered good in the first round and got good score . He asked to introduce myself , then asked if I have any other offer, I said yes, then he asked then y do u want to join SAP, I explained.

He started with a puzzle:

- There are 10 balls out of which one ball is heavier and all other balls are of equal weight , how many min measurements are required to find the heavier one?
- Again a puzzle on weights, There are 25 machines producing 1kg weights , suddenly a machine corrupted and started producing weights measuring 999grams,Find the machine with a single measurement?
- Have u worked with any database?
- What is mySql?
- What are triggers. How to use them?
- Why do we need a foreign key when we have a primary key?
- What is index in SQL?
- What is use of joins?
- Explain your projects?
- Last question as usual any question for me? I asked two , he said thanks and I left.

#### **Round #3: Managerial**

The interviewer introduced himself and congratulated me for clearing two rounds. Asked me to introduce myself, then my qualities. I said I always want to find newer ways of implementing things, he asked me to give some examples about it, I explained one from my project and the other one from my first round regarding the program for finding the second largest example, he was very impressed. Asked about my projects and other things apart from academics. Asked whether I have any offers.

What I know about SAP, why SAP?

He gave me a pattern, it was a pentagon , then 2nd one was two pentagons whose vertices were connected, every line between two points would be considered as a connection. How many connections would be there in the 75th pattern. I tried to solve and came to a recursive solution within 5 mins( Ans:  $5(n)+\text{number of connections in } [n-1]\text{th pattern}$ ). He said this a recursive solution , how can u find without using a system , I explained him that all things we do are on system and clients would need a program for such a question and this would work fine, he was very much impressed.

He said he will choose a number between 1 to 200 , U have to write down a set of questions asking them u have to tell me the number and note that the same question should work if I change the range from 1000-2000. I started thinking , then I thought a binary search would work in this case, I wrote related questions and said it's a binary search he asked me to write a code for it, I wrote. He asked how would I adjust to Bangalore as I am from other city I explained. Then he asked me to ask any questions.

#### **Round# 4: HR**

Interviewer introduced himself, he was about 35, asked me to introduce myself, and explain me about my projects, after that he asked whether ever worked within a team, I answered everything.

What are my interested areas, I said cloud computing, Big data and IoT he asked me to explain. Asked whether I have any other offers, I said yes then y I would prefer SAP. I explained him, he asked me about my family, will I able to move to Bangalore? He did not say I was selected but from his words I got that :). finally he said we have an offer to u, and explained all benefits , pay and all. I said thank u sir, he asked me to chose preferred joining date and asked if I had any query and I asked few and said thank you.

Small Suggestion:

Its not about the answer its all about how u approach the problem may it be a program or a puzzle. Be confident, tell them if u don't know a particular question, make sure u tell them your approach ,given an opportunity to ask questions at the end, always ask a few, this would show your interest to the interviewer.

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## **SAP Labs Interview Questions | Set 8 (Bangalore)**

#### **Round One:**

- Find Min and Max of an array in only one traversal.
- Given a chessboard find maximum number of squares present.
- Job description.
- Difference between deep and shallow copy.

5. What is C++
6. What's "preinitialization"

**Round Two:**

1. reverse a linked list
- 1.1 Use Recursion
2. Copy constructor, operator = different used cases, code
3. Deep Copy, Shallow Copy Used cases
4. Different versions of polymorphism, how to solve the problem of multiple inheritance.
5. Deep look into Virtual concepts, inheritance.
6. Template classes, WAP operator= for template class such that it behaves differently for int and char \*
7. Given a tree, WAP such that a matrix is generated so that:

**Tree:**

```

1
/\ 
2 3
| /|
4 5 6

1 2 3 4 5 6
1 0 1 1 1 1 1
2 0 0 0 1 0 0
3 0 0 0 0 1 1
4 0 0 0 0 0 0
5 0 0 0 0 0 0
6 0 0 0 0 0 0

```

Hint: Preorder

8. Given an array, 1 2 0 5 4 88 0 0 0 6  
make it, 1 2 5 4 88 6 0 0 0 0
9. Gave me class hierarchy, List the number of VTables created
10. When to use List and when to use Vector of STL
11. Given a string "I LOVE INDIA", print "INDIA LOVE I"

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## SAP Labs Interview Experience | Set 7

A brief documentation of my SAP Labs India interview

**Round 1 : Statement Round**

We were 5 people and given a problem statement and we were asked to design application or think about how should be the application and present our idea individually.

my topic was "design parking app which will show the available parking slots and fare in a particular area"

**Round 2: Technical Interview 1**

1. What are ACID properties with real life examples.
2. what is Linked list and reverse the linked list using single pointer/ 2 pointers.
3. What is RDBMS.
4. what is virtual memory
5. what are primitive data types? what is bitwise operators?
6. what is primary key? unique key?
7. Can unique key be a primary key?
8. What is foreign key? can foreign key be Null?
9. what is normalization? why should we do normalization?
10. normalized form is better or storing in a single table/ 2 tables is better?
11. create database of IPL
12. write a query to find name of a player with maximum number of runs in a match on given date and given venue.
13. query 1 2 3 4 5 6 7 8 9=100 solve this by placing or without placing any operator.
14. one more puzzle of making the probability of ball selecting... etc.

**Round 3: Technical Interview 2**

1. OOPS concept with real life examples.
2. what is class n object. comparison with real life.
3. program to swap numbers without using temp variable.
4. abstract class, friend class, and other questions related to class concept.
5. Inheritance and types.
6. WAP to print series, with printing characters if divisible by 3, 5, 3&5.

7. Some queries and concepts of RDBMS.
8. OS concepts
9. Puzzle of no of iteration to find light weight ball out of 9 balls.

#### **Round 4: Managerial Round**

In this round i was asked about project i worked in and why i want to leave previous company?  
kind of work i do in project.  
what is SAP and cloud computing  
family background and personal info.

#### **Round 5: HR Round**

1. Tell me an experience of yours in that you didn't like to do and how you handled it ?
2. What is your negative point that you want to improve?
3. why you want to leave the previous company and why SAP
4. how will you manage when requirement changes at last moment.
5. want to work with team or individually? and why?

Note: At the start of every round you have to give introduction, so make sure that you are giving all info about you and prepare intro well.

Thanks geeksforgeeks, with your help i was able to crack this interview.

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## **SAP Labs Interview Experience | Set 6 (Experienced)**

#### **1st round online test-**

1. Psychometric Test
  2. General Aptitude
  3. Analytical Aptitude
  4. Verbal Skills
  5. Computer Skills
  6. Coding Skills
- Coding ques – 2ques requiring very basic coding skills in C.

After clearing this I was called for interview process.

#### **2nd round- designing round**

we were divided into groups and given problem statement, assigned mentors group wise, bt asked to create solution individualy. Given around 3040 mins to design a banking system with given requirements,

Design should include

- Logic Flow Diagram
  - E-R diagram (very important)
  - DB tables with relations between them, preferably normalized
  - Commands for transaction with tables
- A PI with mentor on basis of design/DB tables etc created.

#### **3rd round-Technical**

Basic questions on

- C (string, array, bitwise operators)
- C++(inheritance concepts, private/public/protected concepts)
- protocols HTTP,TCP/IP
- current project
- ER diagram for some requirement the create Db tables and write C function for transaction from tables.
- Noramlisation 1NF, 2NF, 3NF BCNF with examples
- Dynamic and static binding
- developement and testing lifecycle and types based ques
- Design patterns used in software development
- OS ques paging etc
- linux commands
- puzzles (find volume of air in a bottle etc)
- difference bet product and project
- diff bet system software and bussiness software
- abstract and interface examples

#### **4th round-Mangerial**

- normal ques about college, ranking in class etc
- why should I hire u (justify you characteristics which u mention in this ans), why do you want to join SAP.

Then he asked me do i have any ques, I asked about Onsite opportunities, and then while discussing I told him about my interest in visiting Heritage places, so he told

me about an organization which conducts Heritage walks in delhi for places not so famous but with rich historic significance and then gave me contact details. I dont know how much I impressed him, Bt I was flattered by this gesture.

#### 5th round- HR

He asked me how should i weigh Howrah bride and asked to give any answer I like, normal or wacky. My answer was very normal so i not gonna write that. ☺

And then ques about my weakness and strength, my previous company, reason to change etc.

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### SAP Labs Interview Experience | Set 5 (Experienced)

First of all, i got the mail and was asked to attend one online test. Online test had 6 parts-psychometric test, aptitude, logical, English, computer skills and 2 coding questions. Time was 90 minutes. I cleared the online test round and was asked to attend the interview rounds.

Interview round consisted of 4 rounds-2 technical+1 managerial +1 HR

#### 1st Round-

First the interviewer asked me to give my introduction.Then he asked about the projects which i am doing in my current company.C,C++ basic concepts,real life examples for inheritance etc.As my project was on web programming he asked me questions related to web like why we use backend,how to troubleshoot problems,about performance issues, client and server.

After that i was called for the second round.

#### 2nd Round-

Again 2nd round started with an introduction . Then he started asking questions from resume. Working in the current company and all the projects that i have done. Few OOPs concepts (with proper explanation and coding) and some database related questions.That was the 2nd round. He asked me to find a number which when divided by 2 ,3 ,4 ,5 ,6 ,7 ,8 ,9 ,10 individually gives remainder 1 and when divided by 11 gives remainder 0.Then he told me to draw E-R diagram of shopping site like flipkart.

Then i was called for the 3rd Round.

#### 3rd Round-

Introduction. After that he asked why i wanted to join Sap.He asked me two SQL questions.one was related to joins and normalization and the other was related to the aggregate functions used in SQL. Then he asked me simple linked list question which was to find the  $(k/n)$ th node where k is the size of the linked list and n is a given number.After that he asked me a puzzle to find the average salary of number of persons without disclosing their salary to anyone.

Then i was called for the 4th Round.

#### 4th Round-

It was just a formality and it was of 20-25 minutes.

I would like to thank geeksforgeeks. You really helped me a lot.

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### SAP Labs Interview Experience | Set 4 (Off-Campus)

Hi everyone, Recently i had wonderful interview experience with Sap Labs India. I would like to share the interview experience with all the readers and hope it will help all of you in your preparation for SAP Labs.

First of all, i got the mail from SAP about there opening for developer position and was asked to attend one online test. Online test had 6 parts-psychometric test, aptitude, logical, English, computer skills and 2 coding questions. Time given to us was 90 minutes. Paper was quite lengthy and of average difficulty level. I was able to complete all the sections, but only one coding question. My coding question was- to reverse a string, second i don't remember.

After one week i got the mail that i cleared the online test round and was asked to attend the interview rounds on 14th Feb 2015.

Interview round consisted of 5 rounds-4 technical+1 managerial (including HR).

#### 1st Round-

Firstly the interviewer asked me to introduce myself after he introduced himself. Since i went there as experienced guy he asked me about my workings in the current company.

Later on he asked me few coding questions like BFS and to print prime numbers between two intervals. Then he asked question about normalization(BCNF) and some queries like 2nd max and 2nd min(as we all know.:)) . After that he asked me some basic questions related to C,C++,Java and difference between each of them. In the end he asked me 4 puzzles(cut the cake into 8 equal parts in 3 cuts,bulb-switch problem,calculate 45 mins using 2 candles etc.).

After that I was called for the second round.

#### **2nd Round-**

Again 2nd round started with an introduction from both sides. Then he started asking questions from resume itself. Working in the current company and all the projects that I have done. Few simple puzzles, OOPs concepts (with proper explanation and coding) and some database related questions (questions were easy you just need to brush up the basics). Some keywords related questions from C, C++, Java (usual questions like static, final, abstract etc.). That was the 2nd round.

Then I was called for the 3rd Round. Before 3rd round they also served tasty lunch.

#### **3rd Round-**

Introduction. After that he asked me what I knew about SAP and their products (Please do read all about SAP and their products-not all but at least some famous products like ERP). Then he asked me one puzzle- EGG-DROP-100 STAIRS puzzle (we all know). Then he asked me to code the puzzle (I used the binary search approach-easiest one. :P). That was the 3rd round.

Then I was called for the 4th Round.

#### **4th Round-**

Introduction. After that interviewer asked me whether I do online shopping or not. I said yes then he asked me to design the online shopping portal using ER-Diagram. Then he asked me to create all the tables and populate it with data. Later on he asked me to normalize it. After all of this he asked me some simple puzzles and current salary and notice period. That was the 4th round.

After that I was asked to attend the final round and before 5th round they served snacks and tea to all of us-

#### **5th Round-**

5th round was kind of mixture of managerial and HR. Two people came to take the interview. They asked me questions related to projects that I have done and working of my current company. I was asked to tell them about my current company for at least 2 minutes. Then he asked me one simple arithmetic puzzle- Using 3 only for six times or five times I have to generate 28 or 31 using world's any operator. That was the 5th round.

Over all it was a great experience. I loved being interviewed at SAP Labs. People at SAP are highly cooperative and helpful.

At last but the most I would like to thank GeeksforGeeks. You really helped me a lot to achieve my goal. Thank you so much.

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## **SAP Labs Interview Experience | Set 3 (Campus-Pool)**

Recently I sat in a campus pool for SAP. The whole interview process comprised of following rounds.

#### **Round 1:**

It was an online round that took place on-campus. The round comprised of general aptitude, analytical reasoning, verbal ability and computer science questions. There were two questions to code as well. The round on a whole was good, seeing the time limit they had provided. The results were out in a few days. Out of a total of around 100 students, 17 students from our college were shortlisted. 10 for R&D profile and 7 for Technical or Developer consultant profile.

After this round we 17 students from our college were called at a college where the campus pool had to take place. There were around 100 students from four different colleges there. We all were first given a presentation about the company and then we all were divided into a group of two for R&D and Consultancy profile respectively. The R&D group as told, had to first undergo a first case-study round then two technical interviews and last HR round. Each round was an elimination round. The consultancy group has to undergo one technical, one managerial and one HR round.

I was in the consulting group.

#### **Round 2:**

This was a technical round. There was a panel of two interviewers. They looked through my CV and started by asking an introduction. After introduction they asked me in detail about my projects. As I have had quite a lot of projects on my CV they seemed impressed. After discussion about the projects they asked a probability question in due of the fact that I had won a gold medal in one of the IMO. After that they asked general questions on DS, OS, DBMS and Java. At the end they gave me one question to code. They asked if I have any questions. I asked the difference between R&D and consultant profile. They said R&D is a technical profile while consultant is a techno-managerial profile.

I was the first amongst my group to be called for the next round.

#### **Round 3:**

Two senior interviewers took this interview. They started by letting me give an introduction. Again that gold medal thing in IMO hit them and they gave me a question to first solve mathematically and then approach it via programming. The question was to form all the weights from 1-40 kg by using minimum number of base. I started from the very base and reached up to a satisfactory solution as I had no clue about this question earlier. Then they asked me to design FlipKart with all functionalists.

After this question they asked me about how many offers I already had. I told them I have one. They asked me about why SAP and why not which you already have. I gave them the answer which was suitable according to me.

They asked me to wait. After sometime I was told that I was not shortlisted for HR round. May be my reason for not joining the earlier company didn't go down well with them.

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# SAP Labs Interview Experience | Set 2 (On-Campus)

SAP LABS CAME TO OUR CAMPUS FOR BOTH R&D UNIT BANGALORE AND CONSULTANCY GURGAON.

SAP LABS Procedure consists of 6 rounds.

- 1) ONLINE EXAM
- 2) APPLICATION DESIGN ROUND
- 3) TECHNICAL ROUND1
- 4) TECHNICAL ROUND2
- 5) MANAGERIAL
- 6) HR

## **1st Round: ONLINE EXAM**

First round was an online exam round. Exam consisted of multiple sections of objective questions. 1st section was 10 minute 60 questions round in which behavioral question were asked. Besides this, there were 5 more sections- maths, logical reasoning, technical(mostly C output questions), verbal and coding round. Maths section(10 questions) was tough, Logical Reasoning(15 questions) was tougher, technical(10 questions) was relatively easy, verbal(10 questions) was also easy. The coding round had 2 questions. The questions were selected randomly. I guess you had to solve atleast one to qualify for the R&D interview process. One question carried 40 marks and other one 20 marks. You had to write full code for the 40 marks question and partial code was given for the 20 marks one. Just as an advice, learn parsing before appearing for the written test(for coding).

THEY SHORTLISTED TOTAL 55 STUDENTS, 24 FOR R&D AND 31 FOR CONSULTANCY!

ALL ROUNDS WERE ELIMINATION ROUNDS HEREAFTER!

## **2nd Round: APPLICATION DESIGN**

This round was meant to see your design skills. All the students were divided into groups of 6 and each group was allotted a mentor. We had to design an e-commerce website just like amazon/flipkart. Here it is important to make E-R diagram, class diagram, database table design, testing strategies, transaction details, etc. The time allotted was 30 minutes. Its also important to convey your idea regularly to the mentor allotted to your group who will monitor the progress of each student of the group after every 5 minutes. 2-3 students will be selected from each group.

## **3rd Round-TECHNICAL ROUND1**

It was a technical round and I was asked questions from OS, DBMS, DS, OOPS. Questions were also asked related to cloud since SAP is working on cloud these days, cloud security, memory distribution in case of parallel computing, some coding questions, some basic oops concepts and one puzzle. Puzzle was given a rectangular cake, one smaller rectangle cake has been cut. Now if allowed to make only one cut, how will you do so to cut the cake exactly into two equal halves.

## **4th Round-TECHNICAL ROUND2**

The level of questions were raised, so it was slightly tougher than round1. This round again covered questions from all the subjects. Was asked as to how to make your own garbage collector in java. 1 puzzle was also asked. Modified version of HAT puzzle.

## **5th Round- MANAGERIAL**

The round was for checking whether you fit in the company's environment or not. The interview ran for approximately 30-45 minutes (more because I was the first student who cleared the above rounds.). The manager asked everything related to the resume, interests, saw my leadership qualities, asked as to whether i will be comfortable with coding, testing or support role. He also gave a puzzle( the common 3 and 5 jug problem) though he wanted more than 1 solution. He also gave a coding question and a database design question for room allotment.

## **6th Round- HR**

HR Round was more of a formality, though it also was of 25-30 minuted duration. It was a typical HR interview. Was asked behavioral questions and profile related questions!

Finally three students were selected for R&D and 1 for consultancy role.

Thanks to GeeksforGeeks for their awesome content! Contains pretty much everything to land u in your dream job.

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# SAP Labs Interview Experience | Set 1B (For Developer Associate)

SAP Labs Procedure consists of 5 rounds.

- 1) ONLINE EXAM
- 2) APPLICATION DESIGN
- 3) TECHNICAL
- 4) MANAGERIAL
- 5) HR

## **1 Round: ONLINE EXAM**

First round was online exam round. Exam consisted of multiple sections of objective questions. 1 section was 10 minute 60 questions round in which behavioral question were asked. All the questions were simple. I didn't think this section had any weight age from the point of view of marks/cut off. It was only to judge what kind of person you are. Remember although questions were yes/no kind of questions but among all those question they ask same thing in more than one way so if you try to check the option which should be correct instead of what you actually feel then you might end up giving different answers to same questions which might lead to your rejection. So it's in your best interest to answer what you feel. Other sections were aptitude and quantitative. There was one technical section in which o/p questions were asked and some operating system questions were there too. There were 2 coding questions in last section. Solving at least one of them was essential for getting shortlisted. Difficulty level was above

average. Important aspect was speed. Around 200 students appeared in this round and 30 made it to the next one.

## **2 round: APPLICATION DESIGN**

This round was to check your innovative skills. There were 6 groups of 5 students each. Everyone was given same problem and needed to come up with 3 ideas of apps designing

which can be helpful in solving social issues. Example was given by recruiter as – Suppose you are on your way and you see an accident so you take out your phone and click a picture and upload it via your app and authorities were informed immediately through that app. We were given 45 minutes to think of 3 ideas and make class/E-R diagram for those ideas. After 45 minutes everyone was given 5 minutes to explain their ideas in their group. Even though some students had better diagrams and writing than me (or at least that's how I felt) but they didn't make it to the next round because presentation was important as well. Keep it interactive and if possible ask them if they have any questions at the end.

18 Out of 30 were selected for the next round.

## **3 Round-TECHNICAL**

It was a technical round and there was no specific pattern of questions. It was purely dependent upon you interviewer what you'll be asked. Although overall areas covered were OS , DBMS , C output question and some networking too.

**1)question** – Give your intro which I had prepared already.

### **ADVICE-Give your intro in categories like-**

- a) first your background(very short version).
- b) Tell him about your academics profile.
- c) Tell him about your area of interest.
- d) Tell him about project(s) you have done.
- e) Tell him about your technical skills in categories as which one you are proficient in and which one you are good in. Don't mention the average one unless asked explicitly about those.
- f) At last tell him about what kind of person you are.

My interviewer was very keen. He kept everything in his mind I said. First he asked me to explain myself with examples as I said that I am very punctual and honest ? . I explained that to him and he seemed satisfied.

### **2)question-**

Asked me about my project. I explained him problem statement first then what was the solution and then its implementation. He had some cross questions and I explained those.

**3)question**— Asked me one simple c output question.

While("abcd");

What will be output with explanation?

**4)question-** Detailed discussion over MAC address as

- a) What is MAC address.
- b) Why do we use MAC also if IP address is already there to identify computer nodes in network .

Just to see whether my concept of MAC and IP was clear or not.

### **5)question-**

Why did I choose IT in b.tech.

I must tell you this was not a question where you can throw anything as an answer because when I tried to do that my answer was thrown back at me and I had to give him reasons for my opting IT branch. It was a tech round and even though this question was not very techy but you must explain yourself logically and in steps.

### **6)question-**

He said and I quote- "I want to hack your college network. How do I do it."

Now some questions are asked in that way for which answer cannot be to the point and short. So first make it very clear what does interviewer actually want to do/know. So I asked him-

What kind of hacking are we talking about here cause we have DNS server ,database sever ,proxy server and web server. Which one do you want to hack into.

Then he said okay but first I will need to be on the network. How do I do that.

So I said for that you can plug your computer in LAN, you'll be on the network. Next step is proxy server authentication to use network. So as we don't know password (that's why we are hacking, isn't it?) we will have to try all different combinations for user id and password and for that we can use tool like hydra(thank god I remembered this tool from somewhere).Then he asked me some other way to do it as it might take forever to guess the correct combination. So I suggested him that many students will also be on the network and they have vulnerable open ports. So we can scan the network using NMAP and find such open port then use them to get into network. So now we are in the network next thing I asked now which server you want to hack. He said database server-

So I replied that we can use SQL injections. He asked me to explain that and I did. He asked if I knew any other way. Thanks to once seemed useless cryptography, I remembered "MAN IN THE MIDDLE ATTACK".I explained that to him. He seemed very satisfied.

### **7)question-**

He took his i-phone and showed me it's fingerprint scanning feature + password feature in case of fingerprint scan fails. Then he asked me to write code for it. I wrote code for that. One line in code was if(scanned fingerprint=system stored fingerprint) so he asked me that fingerprint scanner is very small and our thumb is very large. How would one part of thumb will be matched to another part (cause it may happen that you had given lower part of your thumb print initially and now you are trying with upper part of thumb).How do we resolve this issue in programming. I explained him it's not about exact matching but it's about pattern of thumbprint and for that we can use pattern matching instead of simple "=" operator. Then a little bit about pattern matching.

### **8)question-**

He asked me how good am I in puzzles.

I told him that I am good in puzzles. So he started asking me one. As soon as he started to explain puzzle I recognized that puzzle and told him that what he was going to ask and solution as well. He seemed impressed but apparently I dropped an axe on myself. He got the idea that I am very good at puzzle and he asked me a tough one that I didn't read about ever so I tried all that I could but couldn't find the solution. Then he moved on to the next questions but seemed disappointed as he was starting to expect much from me.

### **9)question-**

He asked me what is a data structure and why do we use one.

Explained him.

He asked some real life example of stack and queue.

All I could give him was programming examples but when he insisted on real life examples I gave him some weird made up not so real life example. :-)

#### 10)question-

He asked me about recursion

Explained him.

As we were talking very much on each question. He felt like talking more and from tech he went around for some biggest learning from a mistake/biggest achievement of life kind of questions. There were other questions too which I can't seem to remember now.

He told me that he is done with the interview and if I had any questions.

I asked him about opportunities to go foreign in future and he told me that there will lots of trips and opportunities to go Germany, US and other countries.

So this round went for more than 1:30 hour but it was good.

After this round 6/18 were cleared for the next round.

#### **4 Round- MANAGERIAL**

In this round initially introduction then he gave me a problem for making class diagram for an online shopping website within 5 minutes.

I made that then he had some questions and also pointed out some naming mistakes but apart from that conceptually he seemed satisfied with my diagram.

Then he asked me that he has explained different areas that SAP Labs is working in. which one I would be interested to work in. Now here comes the problem as I couldn't remember what those areas were. So I said I'm interested in technical work and will be hoping to work on a managerial post after 4-5 years. He said that's okay but as all the

work we do is technical but which field I would like to work in. I was getting his point very clearly but I was afraid to say an area name in case SAP Labs is not working in that field and I'll be screwed. So I said "I'm sorry sir. I am not getting your point". He explained me that our company is working in ERP, Analytics, Cloud computing and gave some other name too(now I got all the names ?). I thought for 10 seconds and chose cloud computing and analytics. He asked me why these and why not others. I explained him that my project was on analytics so I loved that I am also fascinated with cloud computing. He said okay how are you fascinated and what do you know about cloud computing. I explained him all that. He seemed happy.

Then he asked me what career path I'll be following. I didn't remember those as well clearly so he drew all of them and then I selected one path and explained him my reasons. Lucky me that he wasn't looking for how much attention I paid in PPT.

ADVICE- pay attention during ppts.

Then he asked me if I have any questions for him. I replied that I had but I asked in last round.

(NEVER SAY "NO" WHEN GIVEN OPPORTUNITY TO ASK SOMETHING EVEN IF YOU DON'T HAVE ANY REAL QUESTIONS JUST ASK ANYTHING OR EXPLAIN THAT YOU HAVE ALREADY ASKED THEM IN PREVIOUS ROUND BUT NEVER SAY "NO".)

Only 4 students made it to HR round.

#### **5 Round- HR**

Initially intro.

Then some situational question.

Biggest disadvantage of working in a team.

What would I do if I was given to complete 30 days of work in 1 week.

Explained him with some made up stories and partial truth about my internship and he seemed satisfied.

And some more HR questions. Can't seem to remember them now.

Then he said he is done and if I have any questions for him. Never say "NO" in HR for this.

So I asked him about promotion criteria in SAP Labs. He explained very well. HR are really good. The way they categorize objective instantly and then start talking is really awesome. The way he explained the simplest question of mine was awesome.

Then he told me to wait outside for results.

Now all 4 students were done with HR. We waited for 20 minutes and then they came with 4 packets of gifts announcing selection of all 4 students.

After that we went for dinner with recruiters.

#### **ADVICE**

Try to be truthful as much as possible in interview.

Do not lie about your skills in resume.

Use preparing materials like-

For written exams—

a) \*\*\*must do 295 C for o/p question practice.

b) \*\*\*Solve geeksforgeeks quizzes, gate exam papers. c/c++ sections.

Geeks for geeks is best source available for cs/it students. Use it well.

For interviews—

Prepare basics well during 3rd year in all subjects.

Read all famous puzzles from puzzles sites.

#### **And most of all keep smiling during interview.**

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **SAP Labs Interview Experience | Set 1 (On-Campus)**

Hi, A brief documentation of my SAP Labs, India interview is as follows:

#### **Interview Round 1:**

Q1. What is I of ACID properties?

Q2. What is write ahead logging in DBMS?

Q3. What are the deadlock avoidance schemes?

Q4. What is clustering index ?

Q5. There is a program which inserts and deletes node in a sorted singly linked list. There is a bug in one of the modules, how would you debug it?

Q6. What are the ways in which fault tolerance can be ensured in systems? (Different redundancy techniques)

Q7. A pair of redundant systems are operating, how would you ensure that when one of them goes down, the other one will take over its operation ?

Q8. Virtual function in C++.

#### **Interview Round 2:**

Q1. Implement the malloc() and free() operations. Give the strategy for implementation, no coding.

Q2. What is structure padding ?

Q3. A window of size k is sliding from left to right in an array of size n, find the maximum number in the window at each window position.

Q4. Explain your project in detail especially your contribution.

#### **HR Round:**

Q1. How was the interviews ?

Q2. What is your negative point that you want to improve?

Q3. Would you like to change your domain, if yes why ?

Q4. Tell me an experience of yours in that you didn't like to do and how you handled it ?

Q5. What are you expecting from the company ?

Q6. Are you comfortable shifting base ?

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
SAP Labs

## **Goldman Sachs Interview Experience | Set 23 (2+ years Experience for Java Developer Role)**

I went through an interview at Goldman Sachs in their Bengaluru office for Java Developer role, and I would like to share my experience with you to help everyone to go through and prepare well for the same.

Reporting time was 9.30 am, I reached there before time, was given a temporary id, and rounds started at around 11 am.

#### **Round 1 (written : 1 hr)**

We all were given question paper with 3 questions and answer sheets with 1 hr duration.

1. Write a method to convert a number (range : 0 to 9 billion) to a String literal, e.g. sample input : 12345 , sample output : Twelve Thousand Three Hundred Forty Five.
2. Merge two array lists to one without using inbuilt functions, map and set, remove all duplicates from merged list, and also print number of duplicates.
3. Two tables were given with Foreign key relation on one table with other, and 2 scenarios were given, need to write SQL with join, aggregate operators etc between both tables and get results.

After this in half an hour results were declared, and just after that I got call for next round.

#### **Round 2 (F2F : around 40 mins)**

Two guys took this round

1. Asked about current job, work, build process and testing processes we use etc.
2. Lots of questions were asked from java collections, Comparable, Comparator, synchronized hashmap, equals(), hashCode(), hashMap internal working etc.
3. Some SQL queries using joins, group by, having, count etc
4. Multi threading scenarios, producer consumer problem, write a program for deadlock between 2 threads, locking on object etc.
5. Find middle element of linked list, find last nth element of linked list.
6. Program for tribonacci series.
7. java8 features.

This round went very well, I gave optimized answers for most of the problems. After this I waited for around 3 hrs before next round call, had lunch in between.

#### **Round 3 (F2F : around 20-25 mins)**

Two ladies took this round

1. Asked about my current project in detail, gave me various scenarios, how this will happen in your current project, explain step by step, DB tables involved, how data will persist etc.
2. Gave me some hypothetical scenario and told me to design an application for it (either using DB model or Object model) and explain it.

I explained everything well, and created good design for second problem also. After this round waited for around 15 mins, for next round

#### **Round 4 (F2F : around 20-25 mins)**

1. Asked about complete project in detail, current organization, reason of change etc.
2. Write program to implement queue using not more than 2 stacks
3. Write a program for equals() method to compare contents of 2 objects, I used instanceof operator to verify class type, but he asked me to change it in such way that

all subclass objects (with same contents) also return false when compared using equals() method, so I used getClass() method instead of instanceof for comparison of object type.

Interviewer looked to be very impressed after this round, in around 5 mins, got call for next round.

#### **Round 5 (F2F : around 20-25 mins)**

Interviewer was technology head for Java

1. Gave some scenarios related to type erasure in java, and asked me expected output/error, I was not much aware of this, first I gave wrong answer, then he explained me what type erasure is, I was able to answer further questions on this.
2. Some questions related to String Constant Pool, I answered correctly.
3. What you don't like/drawbacks of java? new features in java8.
4. Then he gave me following scenario and told to write the program,

Write a method which take list as input, and return any random value from List as output, with probability of return should be same for all elements of the list, you are given a helper random function which gives value from 0.0000 to 0.9999999 (consider these numbers are highly precise, and we need not to worry for precision). I was not able to come up with equal probability approach, so finally he gave some clues, with which I got the answer.

Let x is random value returned by random method, and n be the size of input list.

x can vary from 0.000 to 0.999

we want to return list index from 0 to n-1.

so simple answer, multiply x with n, to get indexes from 0 to n-1, and return the corresponding value from list.

5. Then he changed above question random method, and told it can give any of these value 0,1,2,3,4,5,6,7,8 or 9, now solve the same problem, I tried many approaches but was not able to get any satisfactory answer.

Later, after interview was over I thought over it and got answer using following approach

Let x is random value returned by random method, and n be the size of input list.

x can vary from 0 to 9.

Get number of digits in n (size of list), let us say size of list is 230, so it is having 3 digits.

Now we need to convert x from 0 – 9 to 0.000 – 0.999

For this we can call random method 3 times, and lets say it returned 3 random values x1,x2,x3 (all values lie in 0,1,2,3,4,5,6,7,8,9)

Now we can do  $0.1*x1 + 0.01*x2 + 0.001*x3$  to get a random number from 0.000 to 0.999. Now using approach from question 4 we can get the answer.

I wish I could have thought of this during the interview.

My interview was conducted on Saturday, they told me they will get back on Monday, I thought my earlier rounds went very well, and they may balance out few misses in last round, but unfortunately it was not, on Monday they informed me they can't take my candidature forward. I felt I missed out a very big opportunity by a very small margin.

I wish this post will be helpful to all people going to appear in Goldman Sachs interview, all the best to all of you.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Goldman Sachs

# **Goldman Sachs Interview Experience | Set 22 (On-Campus for Analyst profile)**

I would like to share my GS interview experience with the prospect of helping upcoming batches.

#### **Round 1 –**

Resume based shortlisting – Basically add your projects related to Machine Learning and coursework related to Math. GS is one of the companies which reviews resume carefully (At least I think so :P), reason being me selected even after a low CPI. Around 250 to 300 students were shortlisted from resume for second round.

#### **Round 2 –**

Test on HackerRank. It included three sections with 45 min for each section. Coding questions (+20, -0) were to be solved in hosted compiler, some were integer type questions to be filled in the blanks (+10, -0, upto 2 decimal places) and some were MCQ (+10, -3).

Programming (Networking, Coding) – DSA revision would go a long way here, believe me, as there were direct questions on complexity of well-known algorithms and postfix, prefix expressions (Stack). 2 coding questions were asked. Be careful, optimized code is the way to go here as your solution may result in TLE for most examples.

Quant – Questions on basic aptitude like cattle grazing a circular field tied at a pole with rope and dice rolling probability were asked. Also some questions on expectation value, covariance, correlation and some matrices, determinant problems. I would recommend revising Prob Stats and Linear Algebra course if time permits.

Data Science – ML theory will help a lot. Questions were quite conceptual as they demanded theoretical knowledge like what to do to compensate for missing data. Some of them had 4 statements and correct ones have to be selected.

You have to do well in any two of the three sections, but an overall high score will increase your chances of getting selected easily by smooth interviewing. Also interviewing preference is set on the score in test. Here around 60 students were selected for next round, but beware as most of them are selected just in case. Because some of my batch mates couldn't get another round of interview after their first mistake. When it comes to tests, higher you score, the better to leave a little load for last rounds (Some of us aren't good at conversations after all).

#### **Round 3 –**

Here comes the loads of interviews at 6:00 am. Around 5 to 6 interviews if you get lucky. Although lesser number doesn't mean you are rejected. They try to find the

best fit department for you. Be punctual guys. Believe me they are there on time. And get a good night's sleep. I tried to sit in as many companies as possible. I had a test up till 2:00 am that night. I was sleepy head all the time (they were considerate and sympathized for me, worked in a positive way for telling hard working attitude) as I couldn't get proper sleep and had to wake up at 5:35 am (1st December chills of Kanpur) to check interview schedule and rush to venue meanwhile tying knots and combing hair, putting some deodorant and assuring my mom that I have woken up and trying not to fake it at all.

1st interviewer asked me a question on convex hull. Basically write a code to connect points in a way that they generate least area closed figure and encompasses all the given points. At first I couldn't answer it. 6:00 am and you are asking me convex optimization, you must be kidding, right!!! (although it is a standard problem which I came to know about a little later in canteen with my friends who told me that it was so easy and I had to tell that hell yeah! I passed it with flying colors.)

Then he reverted back to a simpler problem. Good old problem playing number game with your friend to select any of the number between 1 to 3. Whoever reaches 20 first, wins. You have to tell the strategy to win the game. Basically, you start with your position at 20 and recursively think the problem to ensure that you end up at 16 (problem specific) before so that your friend ends up at any number between 17 to 19 and so on solve for 16.

2nd interviewer asked me a question on calculating variance, about gaussian distribution and something about my internship.

They won't let me go for other companies in between which is a good sign for anyone if they are calling you back again. If not, don't sit there, try somewhere else because they won't tell you till end to leave. If you really want to get an interview, try to get in touch with organizer guy from company's side.

3rd were these really cool dudes who started off with a matrix problem where each element was sum of row^2 and e^column. Now I had to prove something about equality of sum of elements that I don't clearly remember but ultimately he would drive the result to generalization of function of row and column numbers.

The other one asked me a puzzle about two carts placed on a track with sensor below them. You can start cart with specific speed but afterwards you can control the motion only when cart passes sensor and when it leaves again you have no control over cart whatsoever. How to cause a collision between the two of them? They were quite helpful as I couldn't quite articulate the problem properly. They helped me to get a hang of otherwise very simple problem (Talk to them all the time, they help you out a lot). They showed quite an interest in my low CPI (Prepare good and "genuine" reasons for it, they come really handy).

4th interviewers were really senior. They asked me about general stuff like my interns and interests. They were quite fascinated by my "Interest" in finance and "Global Markets" ☺ (Please don't fake it, instead try to make a habit out of it, works like a charm in every interview if you get good at it). Then they asked me about Yelp dataset challenge and NLP featured in my AI project. They asked some basic questions about libraries featured in Scikit (Python Library on Machine Learning Techniques). Finally they asked me about flash crash in stock market related to another project in intern.

Then came a senior from my department who was in my hall too, working at GS. He asked me if I had any interest left in Electrical (Apparently that was my department for the whole time which had no role whatsoever this whole time, even in eligibility where it was open for all). He was really cool and talking to me in campus lingo. After that he asked me a question in data structures to which I knew best approach but I chose to start from higher complexity. Then "clicked" the lower complexity solution which was not right. Finally I came to an approach using tree which was not the solution he wanted but he couldn't find flaw in my solution. Then the row sorted and column sorted matrix problem of finding an element came. Starting from highest complexity then lower and then lower. I told him all possible solution except the lowest complexity in which I demanded some hint because I "couldn't think of any possible solution". He helped me out and finally I told the solution starting from bottom left instead of top right (Acting recommended only for experts, don't try if you are not 100% sure that you can fake it :P).

After this whole torture which went on till 11:30 am (they won't let me go to any other company), they finally called me in and told me that they were "interested" and would like to "meet" me soon. Instructions were clear and then they asked me if I am going to appear for any other company to which I gave an "honest" answer.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

# Goldman Sachs Interview Experience | Set 21 (On-Campus for Analyst profile)

Goldman Sachs came for recruiting students for the New Analyst profile. Following is a brief description of the process.

### Round 1 (Online Test) : 3 hrs

Online test was conducted on the Hackerrank platform and consisted of objective and coding questions. It was divided into three sections : Programming, Quantitative Ability and Data Science and had separate timers for each section.

Following were the two coding questions:

<http://www.practice.geeksforgeeks.org/problem-page.php?pid=553>  
<http://www.practice.geeksforgeeks.org/problem-page.php?pid=1146>

Focus was mainly on writing efficient code.

### Round 2 (Personal Interviews): Multiple rounds (approx 30 mins each)

There were two or more rounds of personal interviews. Questions were mainly asked from Probability and Statistics (difficult), programming and algorithms (moderate) and resume-specific. Very few HR Questions were also asked.

#### Probability:

1. Monty Hall problem and its variations
2. Probability of two / three points lying on the same side of a semicircle
3. Probability of breaking a rope into three pieces such that the sides form a triangle
4. Two persons are supposed to meet a spot in a time interval of one hour. The person who comes first will wait for a maximum of 15 minutes for the second person. What is the probability that they will meet?

#### Coding:

1. Implement an LRU Cache
2. Version control system for Queue Data Structure
3. Subset Sum problem

4. Hash Table and collision resolutions
5. Given a sorted array find the element whose value is same as its index.

**HR:**

1. Why GS?
2. Why should we hire you?

Resume specific questions.

Interviewers are friendly and they give hints during the process. Always let them know how you are trying to approach the problem so that they can help you better.

All the best.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

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### Goldman Sachs Interview Experience | Set 20 (For Experienced)

I had an experience of 2.5 years and was interviewed at Bangalore office of Goldman Sachs.

**Round 1:**

After asking for a brief intro, the interviewer started by asking Java questions which were: OOPs concepts of Java, what is runtime polymorphism, overloading/overriding, how many collections you have used in java, how does Hashmap works, what is contract between equals and hashCode.

Then, he asked a question on array: Given an int array, arrange the elements in increasing decreasing order i.e. one element bigger than a smaller element then bigger and so on.

After I answered this question, he asked me a simple question that suppose 2 people are starting at some point in circle, first with speed of 4 and second with speed of 6, In how much time they'll meet again. (Don't know the motive behind asking so simple question. :P)

**Round 2:**

Here too, the interviewer started by asking java questions: What is difference between string, string buffer and string builder, what does final keyword do, when can final variable value be changed, what is classpath in java?

After all these questions he gave me a design problem: Suppose you have to design an election campaign application. He gave a number of questions which for which we should provide some APIs for. The question were like: How many total constituency are there? Which all candidates are contesting? Which candidate represents which party? How many male/female candidates won and with how many votes?

The class which I told him were: State, Constituency, Candidate, Party, Voter.

Further I told him that state will have list of constituencies. Constituency will have list of male and female candidates. A party will have list of constituencies (where their candidates are contesting) and also list of all candidates. A candidate will have reference to constituency (in case he decides to contest from a different constituency next time) and a reference to party (same reason as above).

Discussion happened on this design for some 20 minutes on various grounds.

**Round 3:**

I was given a system with IDE on it and was asked to code a problem. Interviewer told me that you can write and run your own test cases and after one hour we'll be running our test cases.

Question: Given a remote having 0-9 digits, plus button (to increase channel), minus (to decrease) and previous channel button (to go to previous channel). We were given 2 numbers stating start and end channel number and an array having various channel numbers. The task was to go to all channel numbers given in array with minimum number of clicks.

**Round 4: (Director's round)**

To start with, he asked me thoroughly about my current work and what things I am working upon. We had discussion for around 30 minutes on my work exp.

Then, he asked me to implement stack. I did it using an arraylist. Cross questioning on this happened for 10 minutes.

After that he gave me a puzzle: Suppose you and me are playing a game on a round table and we both have infinite number of coins. The rules are as follows:

- It is a turn-based game, so you and me take turns alternatively (1 coin per turn)
- We have to place the coin on the table and coins cannot be put on top of each other.
- Coins may not be moved once put on the table.
- if there isn't any room to put coins on the table, the person who placed the last possible coin wins.

So if I give you the opportunity to go first, which move you'll start with to ensure victory?

After this, some discussion happened on GS and its workings.

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

## GATE CS Corner Company Wise Coding Practice

Experienced  
Goldman Sachs

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### Goldman Sachs Interview Experience | Set 19

I had an interview with GS at their Bengaluru office. I have 4 years of experience in full stack development using Java. I had got a call from a consultant.

## Round 1

1. What concepts are u comfortable with in Java? I said collections. He asked which collection classes have u used? I said HashMap, ArrayList and HashSet.
2. When would u use Set and when a list? I said Set supports unique non null elements and List does not have that constraint. So, if I want unique elements, I will use Set. He asked any other consideration? I said the type of queries to be performed on the collection. Like search. He asked any example? I said – employees database. Employees must be unique, so we can use List and search by binary search or similar technique, as generally, they are sorted in some order. But I think he had been expecting the O(1) lookup time answer, or Set. I explained the working of HashMap and HashSet and how that would help a developer to easily achieve the uniqueness of elements but the interviewer was not convinced with my answer to his original question.
3. What is the contract of equals() and hashCode()? What if one is overridden but the other is not?
4. Find second minimum in a given array.
5. Find the pivot point in a sorted and rotated array.
6. Any question for me?

## Round 2

1. Give a brief introduction about ur work experience.
2. Give an overview of your recent project's design.
3. Suppose I have a UI where there is a list or table of items and each item has a profit attribute, a discount attribute, etc. How to ensure that multiple users do not leave the state of any item inconsistent. User can update the attributes or some other web service can do the same. I suggested synchronizing the setter methods of the item. He asked how to sort the items. I said the items would reside in an array list and implemented the Comparable interface. He asked for working code. When I wrote the expression inside the compareTo() method, he said that the design is not flexible as there exists hard coding of sort criteria. He said that when someone wants to sort by another attribute, it would become impossible to manage so many duplicate objects. I said we can do it with the Factory Method Pattern. At this, he effectively terminated the interview round. Somewhere in between, he had mentioned the Comparator interface and I explained to him how it works. I said it is a good choice if one does not want to modify the existing classes. I think he was expecting the compare() method's implementation, as that would not require duplicate objects and the sort by different criteria can be done by simply implementing Comparator in different classes, one class for each sort criterion, and then invoking the sort() method of the Collections class with that Comparator implementation.
4. Any question for me?

Was told to leave for the day. Advice: Try not bringing up design patterns unless asked to do so or u have experience in solving problems with design patterns. Listen to the interviewer and be alert. They provide hints. In round 1 too, I had done a mistake in the rotated array question. He gave a test case where my code would fail. I corrected the pitfall. Take enough sleep before the day of interview.

This article is contributed by **Anonymous**. If you like GeeksforGeeks and would like to contribute, you can also write an article using [contribute.geeksforgeeks.org](http://contribute.geeksforgeeks.org) or mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## Goldman Sachs Interview Experience | Set 19 (For Technical Analyst Post)

The pre-interview selection round had common Aptitude Questions and a Coding question.

For Apti we had 20 questions – Solving Time (30 minutes) ( Questions were moderate not so easy again not so difficult )

For Coding – 1 question – Solving Time (1 hour) ( Coding question was very easy )

Here's the question as far as I remember:

A binary tree has to be filled with characters 'S' and 'D'. 'S' means alive nodes and 'D' means dead nodes. 'S' node bears 2 children or 1 child and 'D' node bears no child at all. For indicating no nodes we use the character 'X'.

The tree input was given in level order.

Output: Find the level which contains maximum number of 'S'

Solution hints:

Find a) number of nodes from the tree b) level of the tree from the given nodes c) construct a for loop such that it iterates through each level and keep a count of the number of S encountered d) Print the level which has the maximum 'S'

Interview Experience:

### 1st Technical cum HR interview:

Asked about the code and approach.

How can you optimize the approach?

Being in Electronics and Telecommunication why would you like to pursue a career in a Software firm?

( Ans: No previous coding knowledge until I joined college, regular participant in online coding competitions, competition for Hardware companies was tough etc etc )

Between 1 to 100 natural numbers, write a code to find all the possible triplets which satisfy Pythagoras' Theorem!

After writing the code, asked about complexity of the code?

Puzzle:

a) 8 litres of water in a jug. How can you have 4 litre, given a 5 litre and a 3 litre jug?

b) Burning Rope Problem

### 2nd Technical cum HR interview:

Asked about my project in detail.

Write a code to implement Bubble Sort!

Write a code to find whether a string is a Palindrome or not?

Given a large string! Find the largest palindrome sequence!

Verdict: Converted.

Advice: Be to the point and talk smartly. Communication is the key for Goldman, so better be good at it.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

### Goldman Sachs Interview Experience | Set 18 (Off-Campus)

Position: Securities Division- Equities One Delta Developer roles ( C++ Developer)

Location: Bangalore(Emabassy Golf Link Business Park)

It was a drive. I was shocked to see 100+ Candidates in Exam Hall.

I think, Around 20 candidates cleared Written Test.(Yeah... I'm In)

#### 1st Round: Written Test ( Duration: 60 Mins)

5 MCQ ( all c++ Code snippets )

1. template without arguments
2. vector erase in for loop
3. deleting a pointer twice
4. sizeof Vs strlen
5. sizeof of derived class with Virtual Functions in it's base class.

1 Programming Question.

-> Event Management. Given some event intervals , each Interval {s,e} will contain start & end time. ([InterVal Tree Problem I](#))

Asked to Implement the following Operations:

- ==> 1.Add/Delete an event
- ==> 2.Find Events happening in any given time.
- ==> 3.Get All overlapping Events
- ==> 4.Time & Space Complexity of each operation.

Have to write syntactically correct Code for these 4 Operations.

#### 2nd Round:(FF2F)

They started with asking about my Current work/Company...etc

I was asked to write code for Stack Implementation. I Answered it, Using Array.

Then, they asked what do you once if goes out of space. I modified my answer using Vector.

Next was some video player test cases. It's bit lengthy problem statement.

the crux of the question is you given bunch of intervals. I have to write a code to print all the time missing interval's.

ex. (4,10), (3,8), (12,20). Interval Range: 0-25, find out the missing intervals in this range?

Output:(0,3)(10,12)(20,25) .

I couldn't able to provide a solution in my 1st attempt. They gave me some time to think & Answer. In 2nd Attempt i quiet solved it.

My Solution:

sort the given intervals on Starting Time of intervals.

For the above example, they look like (3,8) (4,10) (12,20).

Iterate through this sorted intervals, print missing intervals.

that's all. I was asked to leave after 2nd round.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

### Goldman Sachs Interview Experience | Set 17 (On-Campus for Analyst)

Goldman Sachs recently came to our college for Full-time and intern hiring for analyst

position. I appeared for FTE position, here's my experience.

#### Round 1:

15 MCQ questions of moderate level hosted on hackerrank.

1 coding question : given an array of strings and characters, make the largest string possible.

The resultant string should be a combination of the strings given in the array. The given array of characters may contain repeated elements.

Example – Given char array – {a,a,b,c,d,d,e,c} and given strings – {abba, aabc, de, cde} the ans is aabccde .

Around 20 students were shortlisted from this round out of 120 students.

#### **Round 2 (F2F 1hr):**

Discussions on my summer internship project that I did at Samsung R&D, incidentally he did the same project as a full-timer at his time in Goldman Sachs. He asked me about my life-goals and some discussions on my CV.

Then followed lots of questions on OOP, including virtual functions, virtual function pointers and tables, inheritance, data encapsulation and abstraction.

Asked me to explain counting sort. Then gave me a question that contained only 0's and 1's.

Asked me to give the most optimized solution for putting all 1's to the end of the array.

#### **Round 3 (HR Round):**

Standard HR Questions like

Why Goldman Sachs

What's your preferred position in GS

What's the most challenging task that you've faced during your projects

Any questions for us about Goldman Sachs

#### **Round 4 (F2F):**

5 pirates puzzles – <http://www.mathsisfun.com/puzzles/5-pirates.html>

A young man lives in Manhattan near a subway express station. He has two girlfriends, one in Brooklyn, one in the Bronx. To visit the girl in Brooklyn, he takes a train on the downtown side of the platform; to visit the girl in the Bronx, he takes a train on the uptown side of the same platform. Since he likes both girls equally well, he simply takes the first train that comes along. In this way, he lets chance determine whether he rides to the Bronx or to Brooklyn. The young man reaches the subway platform at a random moment each Saturday afternoon. Brooklyn and Bronx trains arrive at the station equally often – every 10 minutes. Yet for some obscure reason he finds himself spending most of his time with the girl in Brooklyn: in fact on the average he goes there 9 times out of 10. Can you think of a good reason why the odds so heavily favour Brooklyn?

([http://tierneylab.blogs.nytimes.com/2009/10/26/monday-puzzle-more-martin-gardner-lets-the-celebrations-continue/?\\_r=0](http://tierneylab.blogs.nytimes.com/2009/10/26/monday-puzzle-more-martin-gardner-lets-the-celebrations-continue/?_r=0) )

Thanks GeeksforGeeks :).

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Goldman Sachs

## **Goldman Sachs Interview Experience | Set 16 (For 2+ Years Experienced)**

I had an interview recently with Goldman Sachs Bangalore for 2+ years Java Developer position. I got call from some consultancy and after my profile got shortlisted I got mail for HR for online test.

#### **Round 1: Online Test(Hacker Rank):**

16 MCQs Java Question.

2 programs: 1. find number of all unique anagrams of given strings 2. Find path to reach at end of matrix (m,n) in least cost from (0,0)

#### **Round 2: F2F Technical:**

OOPs concepts with real time examples. Exception Handling. How hash map work internally explain on board. Hashmap vs CocurrentHashMap vs HashSet vs SynchronizedMap

#### **Round 3: F2F Technical:**

Singleton Design pattern. How you make it double ton(in even call of getInstance() first object should be return and odd call of getInstance() second instance should be return). Make it triple don.

HashSet internal working. How load factor works in HashMap. When to go for ArrayList and when for LinkedList.

#### **Round 4: F2F Technical:**

print series 010203040506.. using multi-threading 1st thread will print only 0 2nd thread will print only even numbers and 3rd thread print only odd numbers. Some SQL queries normal JOIN queries. Synchronize block vs Synchronize method

#### **Round 5: F2F Technical:**

SAX parser vs Dom parser. How will you store key value pair in sorted way based on values. Given a doubly circular linked list one node is not pointing to next how will

find this and fix this. Same question next pointer is pointing to some random pointer how will you find this and fix this. How will you break TreeSet property (it should store Objects in non sorted order)

**Round 6: F2F Non Technical:**

Given a situation there are three lifts A,B & C, lift A is at kth floor and user wants to go at nth floor what will be the test cases in this situation. Interviewer gave 3-4 situation in same problem to write test cases.

There is method which will take a date i.e. 11/09/2013 and return a expiry date and that is 3rd Friday of input month. Write all unit cases covering all corner case that will a sure that this method will never fail.

**Round 7: Managerial:**

Current project (Architecture), Which technologies are you working on. Why are you using SOAP why not Restful. Why are you using SAX why not DOM. What is Agile. What is your role. Java 8 features.

**Round 8 Managerial:**

Some puzzles. Explained me about GS how they work in GS and all.

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Goldman Sachs

### Goldman Sachs Interview Experience | Set 15 (On-Campus for Internship)

Goldman Sachs Visited our campus a week back and this was the procedure.

**Round 1 : Online Round (90 minutes)**

**Platform:** HackerRank

15 MCQ Questions (tough if asked to solve in 30 minutes)

1 coding question . Question was pnc based.

17 were selected after this round.

**Round 2 : PI (Technical) 45 Minutes-1 hour**

**Introduce yourself.**

Detailed discussion of my projects (make sure you are well versed with your projects)

1 puzzle on the 2 rope problem which burn in 60 minutes ,and you have calculate 45 minutes.

Then asked me my interests , I said Data Structures .

Asked me questions on HashTable , HashMap ,implementation of the same.

Find if 2 given nodes of a tree are siblings or not.

Given a linked list and only a pointer to the node delete the node.

Another puzzle question. There are 25 horses with a race track on which 5 horses can race at a time. How many minimum races needed to find top 3 horses.

**Round 3 (Technical) 45 minutes.**

He saw my cv thoroughly and saw I knew php and hence database. So asked me to design a database system for mobile shops in different cities with different branches in each city. Each branch selling same mobile phone at different costs.

Then asked me to write a query to get the branch and city where the mobiles phone's cheapest price is available.

Asked me implement queue using 2 stacks.

Given two array find which number is missing from the first and second one. (easiest question of all)

**Round 4 (Interview with the hiring manager) 45 minutes**

Asked me to introduce myself.

Saw I knew data structures so asked me to implement heap and asked why trees are used if we can represent the tree in an array ( given that if a child is not present we mark that array element as 0)

Asked me how can we implement a search engine like Google with millions of pages to be searched. I answered hash table as it'll take O(1) time. Then I was asked what would be the time complexity if we've clashing in the hash buckets. Asked me about best hash functions.

One aptitude question. Given 8 balls with one having more weight than other find it in minimum tries (Common question) I answered. He said now let's change the question to "you don't know if the odd one out ball is lighter or heavier than others", now how many tries are needed? (couldn't solve this one)

I would like to thank Geeksforgeeks for helping me in the preparation for my interviews.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

# Goldman Sachs Interview Experience| Set 14 (1+ Years Experienced)

Goldman Sachs Interview questions – Onsite (Experience: 1+ years)

Technical rounds – 4

Managerial round – 1

## Technical rounds

### Round 1

1. Explain RESTful web services. Jersey syntax
2. What is a race condition?
3. What is segmentation fault?
4. What is an abstract class? Can a class be abstract without abstract methods? Difference between an interface and abstract class.
5. Why Java doesn't support multiple inheritance?
6. Will static methods be inherited? Can they be overridden?
7. Merge sort and quick sort.

### Round 2

1. Given an array of 1's and 0's. Segregate them.
2. Given two sorted arrays with sizes m and n. Merge them into a third array of size m+n.
3. A function is given that returns 1 with probability p and returns 0 with probability p-1. Write another function which calls this function and returns 1 and 0 with probability 1/2 each.
4. Three ants in corners of triangle puzzle.

### Round 3 (Vice – president)

1. Questions on projects I had worked on.
2. How HashMaps work in Java?
3. Explain JVM architecture.
4. How garbage collector works in Java?
5. Given an array of numbers, arrange it in such a way that a1 > a2 < a3 > a4 < a5 > a6 < ....

### Round 4

1. Given a linked list, reverse the elements from the beginning in blocks of two. Given: 7 -> 4 -> 9 -> 2 -> Null. Output: 4 -> 7 -> 2 -> 9 -> Null.
2. Given a Rubik's cube of size n (Made of  $n^3$  smaller cubes). You remove all that are visible from outside. How many cubes are left?
3. The 4 people, bridge and one torch puzzle.
4. Java generics syntax.
5. Implement multiple stacks in one array.
6. In an array of positive integers, find pythagorean triplets in  $O(n^2)$  runtime.

## Managerial round

1. Why do you want to leave your job?
2. Why Goldman Sachs?
3. Why not Google? (I said I would be happy to work for Google if they offered me a job)
4. Are you fine working in proprietary languages?
5. 100 gold coins and 5 pirates puzzle.
6. What is your notice period?

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## GATE CS Corner Company Wise Coding Practice

Experienced  
Interview Experiences  
Goldman Sachs

# Goldman Sachs Interview Experience | Set 13 (On-Campus for Internship)

Online Round (Aptitude+Coding) : (2:00 hrs)

Students of all branches were allowed to appear in the online round.

15 MCQs only on aptitude for the first half an hour and 15 MCQs on basis of C,C++,OS for the second half an hour and followed by a coding question to be solved in the next one hour. There was no negative marking. The aptitude questions were really good given the time limit. The test was conducted on Hacker Rank. Compilers for coding were not allowed.

The MCQs section carried 60 marks and 40 marks for one coding question.

Coding Question : Given a set of n integers, divide the set in two subsets such that the difference of the sum of two subsets is as minimum as possible. Return the minimum difference.

### Interview 1(FTF):

First of all he asked about my background and projects then proceeded with the questions.

Q1.Coding Question of first Round.

Q2. There is a stream of Integers coming in. You have to store all elements. What Data Structure you would use such that insert,delete and access should be optimal.

Q3. Implement Queue using one stack.

Hint:use in-built Stack(by recursion).

Q4. What is Graph and where do we use graph?

Q5. N ants sitting at the corners of a polygon.Each ant randomly picks a direction and start to move along the edge of the polygon .What is the probability that none of the ants collide.

**Interview 2(FTF):**

Q1. How many cricket bats in your city? if you have last 10 years data of average number of bats which sold by each shop,number of shops then how would you calculate average number of bats which sold by each shop in next year ?

Q2. You have a long text and n pattern.Which data structure would you use to store text and pattern such that you can get the repetition of every pattern in text at a time.Don't use string matching algorithm for each pattern.

Q3. An array of N integers in range [a,b].Five number are missing in array of given range.Find five missing numbers.

Q4. Suppose that you are standing in a hallway next to 3 light switches, which are all off. There is another room down the hallway, where there are 3 incandescent light bulbs – each light bulb is operated by one of the switches in the hallway. Because the light bulbs are in another room, you can not see them since you are standing in the hallway.

How would you figure out which switch operates which light bulb, if you can only go the room with the light bulbs one time, and only one time?

At the end he asked what are my subjects of interest and if I have any questions to ask.

**Interview 3(FTF):**

Q1. Tell me about yourself.

Q2. What is your strengths and weaknesses.How do you plan to overcome your weaknesses?

Q3. What do you expect from your internship?

Q4. What is future plan?

Q5. What Makes you feel proud of yourself?

A total of 9 students were selected for the internship at the end.

All thanks to geeksforgeeks for helping me with my preparation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## Goldman Sachs Interview Experience | Set 12 (On-Campus)

### 1. ONLINE TEST:

15 APTITUDE QUESTIONS (HIGH LEVEL) FOR 30 MINUTES

1 CODING QUESTION FOR 60 MINUTES ( Q: FIND NUMBER OF CYCLES IN A GIVEN DIRECTED GRAPH – ADJACENCY MATRIX WOULD BE PASSED AS A INPUT)

### 2. FIRST INTERVIEW:

PRINT NODES IN A ZIG-ZAG FORM OF A GIVEN BINARY TREE

DESIGN PROBLEM: TO DESIGN A SYSTEM WHICH WILL TRACK THE STOCK PRICES EVERYDAY AND GIVE NOTIFICATION TO THE USER TO BUY OR SELL HIS SHARES TO EARN HIGH PROFIT

TALKED ABOUT THE RESUME

WHY GOLDMAN SACHS ?

WHAT YOU WANT TO ACHIEVE IN NEXT FIVE YEARS ?

WHY TEAM WORK IS NECESSARY ? GIVE ANY EXAMPLE OF YOUR TEAM WORK

PUZZLE: DOOR 1 HAVING HAPPINESS BUT DOOR 2 NOT . PERSON 1 WILL ALWAYS SPEAK TRUTH AND PERSON 2 IS A LIAR. YOU HAVE TO ASK 1 SAME QUESTION TO BOTH THE PERSONS TO FIND OUT WHICH DOOR IS HAVING HAPPINESS

### 3. SECOND INTERVIEW:

PUZZLE 1: 8 COINS PUZZLE

<http://www.cut-the-knot.org/blue/EightCoins.shtml>

PUZZLE 2: GOLD FOR SEVEN DAYS

<http://www.mytechinterviews.com/gold-for-7-days-of-work>

PUZZLE 3: 25 HORSES PUZZLE

<http://www.programmerinterview.com/index.php/puzzles/25-horses-3-fastest-5-races-puzzle/>

WHAT IS ABSTRACT CLASS?

WHAT IS INTERFACE?

TELL ME ABOUT DIFFERENT JOINS IN SQL

WHAT IS YOUR FAVORITE PROGRAMMING LANGUAGE ? CAN YOU CODE IN DIFFERENT LANGUAGES ?

WHY GOLDMAN SACHS ? WHAT WILL BE YOUR CONTRIBUTION

#### 4. THIRD INTERVIEW:

HAVE YOU APPLIED FOR THE INTERNSHIP IN GOLDMAN SACHS IN YOUR THIRD YEAR ? ( I SAID YES BUT HAD NOT CLEARED THE FIRST ROUND ITSELF ☺ )

TALKED ABOUT MY INTERNSHIP

WHY GOLDMAN SACHS ?

WHY WE USE MULTIPLE INHERITANCE IN OOPs ?

DIFFERENCE BETWEEN VIRTUAL AND PURE VIRTUAL FUNCTIONS ?

IS THERE ANY KIND OF VIRTUAL CONSTRUCTORS OR DESTRUCTORS ?

DESIGN PROBLEM: TO DESIGN AN AUTOMATED SYSTEM FOR THE PROPER FUNCTIONING OF RAILWAY BARRICADES IN A CITY. GIVE PROPER DESIGN , PARAMETERS , FUNCTIONS , RISK MANAGEMENT TECHNIQUES .

THANK YOU GEEKSFORGEEKS !!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## Goldman Sachs Interview Experience | Set 11 (On-Campus for Strats Division)

Goldman Sachs visited our campus for recruiting in the strats division.

Round 1: Pen and paper test which consisted of 3 sections and was to be done in 90 minutes.

First section: 5 questions on Data Analytics.

Second section: 10 questions on Higher level maths.

Third Section: 15 questions on Computer science from time complexity, Operating systems, Data structure, file system etc.

+3 for correct and -1 for wrong answers.

Round 2 (Tech) : 40 minutes

First question to find the median of two sorted arrays of varying sizes, explain all the base cases and the logic as well.

Then had to code it as well.

Second question was to print all paths with the given sum that could end on a leaf only, had to explain the approach and write the code.

Basic discussion about my project on Hadoop.

Last question was a Probability Distribution question similar to how get proportionate probability for the given values.

Round 3(Tech): 45 minutes

Detailed discussion on my projects and internships which lasted for about 30 minutes.

Basic queries on DBMS using group by, order by and nested sub-queries and using limit by and aggregate functions.

Basic questions on OS.

Round 4(Tech): 45 minutes

Puzzles like 100 floor and 2 egg, then modified it to 100 floor and 3 egg; a drunken man can take a step forward or a step back,

what is the probability that after 10 steps he is standing at the same place; some card puzzles based on probability.

Search for an element in a row and column sorted 2D matrix in  $O(\log n)$  time.

You are given a pen. A person could either enter the bid price or selling price or ask to match the highest bidding price and lowest selling price.

What data structure will you use for string the prices.

Round 5(HR):20 minutes

Standard questions like why gs? strengths? weaknesses etc .

At last only 1 student was selected from the 800 odd students who had applied for the company.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## Goldman Sachs Interview Experience | Set 10 (On-Campus)

Following are the details of my interview with Goldman Sachs.

**Round 1:** Written+Online coding (conducted on hackerrank)

15 MCQs- average and high level aptitude questions (30 minutes)- 60 marks

1 coding question (45 minutes)- Given an adjacency matrix of a directed graph, find the number of cycles in the graph.- 40 marks

**Round 2:** F2F Technical

1. Thorough discussion on projects and technologies used in implementing those.
2. A design problem on parsing (as one of my projects involved parsing)- Given dependencies of various modules, one per line in a text file, give me an order in which the modules should execute. Design data structures and algorithm for the same. Complete code was not required.
3. Detect and remove loop from a linked list. Gave all possible solutions. A neat and complete code was required.
4. 2 pills puzzle.
5. Why do you want to join Goldman Sachs?

**Round 3:** F2F Technical+HR

Started with brief introduction of each other.

1. 8 Marbles puzzle.
2. Gold bar puzzle.
3. Difference between an Interface and an Abstract class in Java.
4. Design a three elevator software keeping in mind all possibilities. What all parameters are required? What all will you include?
5. Situational questions.
6. Challenges faced while working in a team.
7. Internship projects and their impact on the company.
8. Why do you want to join Goldman Sachs?

**Round 4:** Technical

1. What is your strongest language? I said C++.
2. How is Dynamic polymorphism implemented in C++? (Virtual classes and functions- code was asked)
3. Difference between pointers and reference variables?
4. Why do we need reference variables if we have pointers?
5. What are the areas you are interested in? I said Big Data Analytics.
6. Some follow-up questions on Big Data Analysis.
7. Discussion on projects.
8. Why do you want to join Goldman Sachs?

**Round 5:** Technical

1. What is multithreading? How is it implemented in Java?
2. What is a deadlock? Draw a deadlock scenario for 2 processes holding 2 different resources.
3. If we have a function- bool isDeadlock(Some Data Structure), what Data Structures should it receive as parameters?
4. Given an int and a float of 32 bits each. Which one is greater?
5. What is a future contract? A case study on the same.
6. What is Diamond problem in C++? Explain and give solution. (Virtual base classes)
7. Why do you want to join Goldman Sachs?

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## Goldman Sachs Interview Experience | Set 9 (On-Campus for Internship)

Goldman Sachs Interview Experience (On-Campus for Internship)

**Online Round (Aptitude+Coding) : (1:30 hrs)**

Students of all branches were allowed to appear in the online round.

15 MCQs only on aptitude for the first half an hour followed by a coding question to be solved in the next one hour. There was no negative marking in the aptitude section. The aptitude questions were really good given the time limit. The test was conducted on Hacker Rank. Compilers for coding were not allowed.

The aptitude section carried 60 marks and 40 marks for one coding question.

A total of 18 students got through the online round.

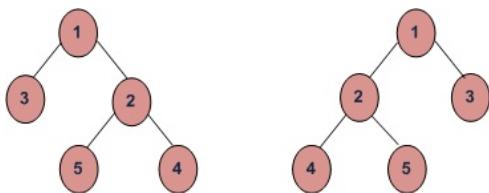
**Interview 1(FTF):**

Q1. Describe a semaphore and explain its working. How would you use a semaphore to solve the producer-consumer problem. A blank sheet was provided to write the pseudo-code.

Q2. Given a binary tree, check if the value at the node is less than the sum of the values of its left and right child, if so replace the value at the node with the sum. Code was not necessary; he demanded proper logic for solving it.

Q3. Given a binary tree, write the code to convert the tree into its mirror image. I wrote the code on a piece of paper and then the interviewer asked some questions about the working of the code. The interviewer seemed to be satisfied with my answers.

Example:



Mirror Trees

#### Interview 2(FTF):

First of all he asked about my background and then proceeded with the questions.

Q1. What is virtual memory ? Describe virtual address space .

Q2. Given a square board of n rows and n columns ,find the total no of squares in it.(There is a formula to it which can be arrived at by observation).

Q3. Find the total number of triangles in a hexagon with edges connecting each vertex to another.

Q4. Write code for reversing a linked list.

Hint: Both iterative and recursive techniques can be followed .

Q5. Find all values of n for which  $n \& (n-1) == 1$  and  $n \& (n-1) == 0$ .

At the end he asked what are my subjects of interest and if I have any questions to ask.

A total of 9 students were selected for the internship at the end.

All thanks to geeksforgeeks for helping me with my preparation.

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## GATE CS Corner Company Wise Coding Practice

[Internship](#)  
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[Goldman Sachs](#)

## Goldman Sachs Interview Experience | Set 7

#### Telephonic Round(1st Round) (Manager):

- 1) Swap two variables without using third variable.
- 2) There 's an array with every element repeated twice except one. Find that element.
- 3) Implement LRU cache
- 4) How will you implement State Machine
- 5) Design Problem: You have a database of million records, that needs to be accessed for each operation. That database is updated very rarely. And there are multiple processes that queries the database and operates on the values. How will you design this?
- 6)How do you write a callback function?

#### 2nd Round( Written):

- 1) 15 qs(65 mins) on C++ OOPS , namespaces, inheritance, dynamic\_cast, static\_cast . The difficulty level was above average.
- 2) C++ program to implement a container class.

```
struct StudentRecord
{
    int id;
    string name;
}
```

You have to implement algorithms:-

- 1) add a new record. This operation fails, if there is any element with the same id.
- 2) Delete a record
- 3) Edit a record
- 4) Find a record
- 5) provide iterators begin() and end()

#### 3rd Round(F2F):

- 1) You have the co-ordinates of two rectangles. Find in minimum number of comparisons, if they are overlapping or not.
- 2) Write code for implementing Tower of Hanoi problem. What data structures you will use? How will you implement the Move function(that moves the disc).

#### 4th Round(F2F):

- 1)Discussion on Important c++ concepts: Virtual functions, Run time polymorphism, Static polymorphism, Function overloading, Function overriding, Types of cast in C++, Static\_cast, Dynamic\_cast, difference between new and malloc, Copy constructor, operator overloading, Templates
- 2) Program for Anagrams. Different approaches( hashing, sorting)
- 3) Code for first non-repeating character in the string
- 4) Least Common Ancestor for n-ary Tree.

#### 5th Round( Video conference from UK (2 persons)):

- 1) About my projects

Puzzle: You have two train carriages situated at a different point on a infinite train track. The carriage can move up and down , and given that they can only know whether the other train has started from this point or not. Write an algorithm which will make the train carriages meet. The same algorithm should run on both the carriages.

2) virtual functions, auto\_ptrs, ordered\_map, Hashing, Chaining , Linked list vs array, Inheritance Concepts, static functions, generic programming, Some advanced concepts: CRTP(Curiously Recurring template problem), run time polymorphism

#### **6th Round(TeleConference from UK(2 persons)):**

- 1) Deep discussion on the current project in my current company

#### **7th Round(With Manager):**

1) Deep Discussion on my current role in company, and what will be your role in the company, about the team, about the work. I said that I have other offers in hand, then he said to evaluate the pros and cons of each offer compared. Then he discussed deeply about the current work.

#### **8th Round(Telephonic with MD for the division from UK):**

- 1) Deep discussion on the current project in my current company

#### **9th Round(Telephonic with Senior Director of the division from UK):**

- 1) Deep discussion on the current project in my current company

- 2) Use of Static keyword in different circumstances

3) Design problem: You have a socket connection on client side. And that socket connection receives million ticks per second for every stocks. Suppose you have 50 stocks. So the value of each stock is changing 10,000 times in a second. So this needs to be shown to the client in the GUI. And also Mean, Median, Highest, Lowest needs to be shown. How will you design in the most efficient way

The Interviewers were very nice. If you would get stuck in any problem, they would drop hints. And if you did any mistakes, they would prompt you and tell you to correct yourself.

Also only if all the interviewers involved will give positive feedback, then only they will move ahead with the candidature. So they make it a point that all the team members meets the interviewee.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Goldman Sachs

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## **Goldman Sachs Interview Experience | Set 6**

Hi, I recently interviewed with Goldman Sachs, and had 4 rounds of interview with them at their campus in Bangalore.

#### **Round 1 : Technical – F2F**

Q1. Check if a linked list with  $2n+1$  elements is a palindrome without using any extra space.

Q2. Given an excel sheet with column names mapped to column numbers as follows :

A-1 , B-2.....Z-26,AA-27.....AZ-52 and so on.

Now write a function to return the column name for a given column number.

Q3 : Find if a given binary tree is a sum tree.

Q4: Then a lot of questions around different technologies and languages.

#### **Round 2: technical + manager**

This round did not have any DS and algorithm questions. I was asked in detail about my project. Then had a lot of questions around java script and java. About different design patterns and web services.

#### **Round 3: Technical F2F**

Q1: Given a stack of unsorted characters, and an empty stack, without using any extra space sort the stack elements and place them into the empty stack.

Q2: Print all nodes at a distance k from a given node.

Q3: A lot of questions around java, collections frameworks, multi threading and so on. (This took a good 25-30 minutes )

#### **Round 4 : Senior manager cum HR- F2F**

Q1. Why do you want to join Goldman Sachs.

Q2. Career goals.

Q3. Compensation discussions.

Thank you geeksforgeeks for making it so simple and easy.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Goldman Sachs

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## **Goldman Sachs Interview Experience | Set 5 (On-Campus)**

\*1\*

Not many campuses around the world deal with "placement season" as we do in IITs. Only an IITian can understand the significance of December 1, the ultimate day

when people from top Indian and international companies start to converge at one place to hire the supposedly best and brightest minds of the country. From toothpaste makers to software developers, there is perhaps no industry which is left unrepresented in the humongous crowd of recruiters who turn up for the event. Although I have personally benefited from this setting, I have strong views against it. But that demands a separate blog which I would write some other day.

On 30th November, things were unexpectedly looking very rosy for me. I was shortlisted for interviews with almost all the companies which I had applied for based on my performance in their tests or my academic profile. I had got interviews with 8 companies in the whole day. It was definitely more than what a sane guy could handle. While planning for the order in which I would give the interviews, I decided to go based on my realistic chances of selection in them and not get carried away by my fancies and their fanciness. GS had always been my dream company, not only because it pays a hefty sum of money as salary, but because the best among the best had chosen it during previous years. There is no better parameter to judge a company than its people, and GS was definitely ahead of others according to my judgement.

During my school years, I had always known that I was the smartest kid in my classroom. But that was definitely not the case in IIT where everybody comes after passing through a certain filtering process, where CPIs can be deceptive and where the laziest student could be the dark horse in the race. Every student of IIT is a combination of crass intelligence and "ability" to work hard. Since GS had shortlisted 69 candidates other than me, the realistic chances of me making through GS were rather less compared to other companies which had much shorter lists. I placed GS after 2 other companies (which also extended me job offers later) in my preference for interview timings. After revising basics of CS subjects and my projects, I was all set to face the battle with reasonable amount of confidence.

\*2\*

On the fateful day, Goldman Sachs started its interview process quite early at 12 am. My name appeared somewhere in the middle of the interview schedule list at 4.00 am which is the time when my body is adapted to go to sleep. I had not slept in 2 days because of the way our placement office had planned technical tests. All this meant that I would go to interview with tiredness from past 3 days. The test venue was highly charged with all sorts of energies. There were many people who had already appeared for few rounds and, by then, had somehow figured out that they had been selected. For many of them, this turned out to be a mere speculation later. I had heard that GS did not take other candidates seriously if they had found suitable ones already (This turned out to be a wrong notion later). I had a reason to worry. Going by their talks, there were many people in the corridor who had landed the job already.

The interview process was running behind scheduled time. The panel took a break, which meant I was not going to be interviewed up until 6 am. At 6:10am, my name was called. My interviewer looked very weary after having participated in 6 hours long process already. A quick tricky question was asked about the Fibonacci series. I understood the question differently and gave solution to a more difficult problem. This got interviewer excited in interviewing me. I gained some confidence and insisted that I be given chance to solve original problem which I solved in no time. General resume discussion happened. I was asked how I thought GS made money. I realized that I had done a blunder by not researching the company properly before coming for the interviews. Nonetheless, reading pink newspapers helped. I answered the question. The interviewer was impressed, and so was I, with myself.

Without a pause, I was called for second round of interview. Since the interviewer was interviewing a filtered candidate, he looked more serious. General discussion on polity issues, macro economics and my course projects followed. Being aware of and having strong views on many public issues helped. The interviewer looked impressed with my answers. Then interviewer came to the actual business. A puzzle question was asked. I knew that it was a fairly popular puzzle but had never attempted it. This was my second big mistake that I had committed before coming for interviews. Although I like solving puzzles and solve one or two here and there, I had not practiced and mugged them up in a way that other serious candidates would have done. But it seemed that I was destiny's own child that day. The solution struck my mind. I later found out that that was indeed the standard solution to the problem. Interviewer wrote something on my resume and asked me to wait to be called for third round.

In third round, the interviewer laid resume on table without folding and I could see what other interviewers had written about me. "Strong yes" it read on the top. I felt good about it. I told interviewer that I had done a course in algorithmic game theory. He asked some game theory questions which I answered. I knew I had nailed it. I was literally on high.

Between third and fourth(final) round, I gave interviews to some other companies. The difficulty level of those interviews and my interest in them were nowhere close to the GS interviews. In fact, I felt bored during some interviews. I realized how much I wanted to be a part of GS already. I got a call for fourth and final round of GS interview. While chanting Hanuman Chalisa quietly in my heart, I realized that I had forgotten it. I had not prayed in a long time and felt guilt for treating God so selfishly, and took a mental note to make amends later. I needed divine intervention to help me to recall anything that I might need during the interview and to think clearly.

The interview started without any needless talks. Once again, a puzzle was asked. I knew the solution to it and thought that I could bluff my interviewer by pretending that I did not. He called my bluff by asking a more difficult problem. It was loosely phrased. It was the first and only problem which I could not solve. But interviewer did not show any signs of disappointment. A strategy question was asked. I gave an algorithmic solution to it. He asked me to code it which I did. The interviewer looked happy.

Without wasting a moment, I moved to give interviews to other companies leaving everything else in the hands of GS people and God. At the end of first slot of interviews, I came to know that I had multiple offers and more choices in hand than I had imagined. It did not take me even a minute to choose Goldman Sachs. My life had taken a surprising turn which I had not thought about till that moment. I had become a part of the rich legacy which Goldman and Sachs had founded in 1869.

Questions:

Round 1:

1. Given  $S(n)$  and  $F(n)$ , two functions which compute sum of  $n$  Fibonacci numbers and  $n$ th Fibonacci number respectively in constant time. Write a function which computes sum of odd Fibonacci numbers in constant time.
2. Now write a function to compute sum of Fibonacci numbers at odd indices in constant time.
3. Write down function to select pivot element randomly in Quick Sort.
4. Probability of comparison of two elements in random quick sort.

Round 2:

1. N door puzzle. ith user changes state of doors which are multiples of i. Calculate number of doors opened in the end.
2. Some fairly simple DP coding problem(I don't remember exact one).

Round 3:

Design a game (Automaton) for a betting scenario. Bet is either doubled or lost completely depending on whether you win or lose. Suppose you bet on team A constantly in a 2 team game, how much money you need initially so that you either win \$100 or lose all at the end of game after 4 rounds.

Round 4:

1. randN function : which generates random number in  $[1,2,3..N]$  with equal probability. Given rand5, write a code for rand7 using rand5.
2. Some number stream puzzle which I don't recall.

3. A strategy question. It would be asked depending on which team you are being interviewed for. Mine was some apple seller problem. Here knowledge of real world scenario helps. Advice is to observe things around you rationally.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

### Goldman Sachs Interview Experience | Set 5

Goldman Sachs Interview Experience

#### Round1:

1. Introduce yourself and what are the projects you have worked on and detail discussion about the most recent project.
2. Implement queue without using any data structure
3. Producer consumer problem
4. In one of the process you are making calls to three APIs. You don't know how much time it will take to return the results from those APIs. Design the system efficiently.
5. Design a parking lot system
6. What is lazy loading? Advantages and disadvantages of the same

#### Round2:

1. Detail discussion about the most recent project
2. Asked me about the favourite topic in C++. I told polymorphism and memory management. He asked me about when a process starts execution what are the different memory segments allocated to it and how they are managed.
3. Implement smart pointer of your own.
4. Questions regarding virtual functions and its implementation and how it solves different design problems.

#### Round3:

1. Introduce yourself and detail discussion about the current project
2. How will you implement your own garbage collector in C++?. Detail discussion regarding approaches and their trade offs.
3. Puzzle: there are two candles and each candle takes 30 minutes to burn. How will you measure 45 minutes? You don't have any instruments with you.
4. Design an Olympic game

#### Round4:

1. Design a traffic light system
2. Discussion about the projects done

#### Round5:

1. What are the different libraries you have used in C++
2. Longest increasing subsequence and its implementation with dynamic programming
3. Quicksort and heapsort and which one of them you will choose
4. Difference between C++ and C#.
5. Why do you want to join Goldman Sachs and what will you bring to Goldman Sachs?

#### Round6:

1. Tell me about the work which you have done and about which you are most proud of
2. Detail discussion about the current project
3. Different types of collection in C# and difference between hashmap and hashtable and their internal implementation
4. Difference between buffered IO and unbuffered IO. Advantages and disadvantages
5. How ajax works? Difference between angular js and jquery

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

### [TopTalent.in] Nothing Could Stop Zubin from Landing a Dream Job at Goldman Sachs



It's not often that you come across a story which is so motivating and inspiring that telling the story to your audience is what you crave for. Zubin Sheth from Jadavpur University is someone special. Having been born with certain physical disabilities, he has crossed many hurdles in his life which an average person wouldn't have to. Zubin is an inspiration for all who crib about how unfair life has been to them and try to find excuses in their circumstances.



He has proved that if you are passionate about something no one can stop you from achieving your goals, no matter how thorny the road might be. When we at TopTalent.in asked him about how he felt after landing a job at Goldman Sachs, he said "it feels really great and satisfying getting into one of the best in the club. But yes, I am still 'hungry' as there's more to achieve. The journey has just begun."

We say more power to you Zubin. In case you would like to download his resume please [click here](#) and download his resume.

#### **What was your preparation strategy?**

I stuck to basics. That's what I've always done. I also used to practice writing code on whiteboard and paper more than system. Maybe that is something different that I used to do apart from regular practice and problem solving.

#### **What resources did you consult? Where did you practice problems from?**

I started off with Cracking the Coding Interview and after completing it I moved on to GeeksForGeeks. I was never a TopCoder fan! I also used to discuss solutions with my friends which made sure I was solving it in the right way and to the best possible solution.

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

For Goldman Sachs, your aptitude and coding skills are not enough. Soft skills like communication – whether you are able to communicate your thoughts to the interviewer, your presentation skills and your confidence are equally important. I think my confidence and the way I explained my solutions struck. Goldman Sachs takes your CV seriously! They look for all-rounders and people who have tried different things.

#### **What's your advice to students who are aiming for similar placement offers as yours?**

Don't do something because everyone else is. Do what you love doing. Even though I was pursuing engineering, I was working part time in Online Marketing. That helps you widen ways in which you think, which is a great skill to possess in the industry. Also in college, we have the time and resources to try and see whether we like something or not. One should NOT waste that opportunity.

Importantly do not jump to higher levels unless you have your fundamentals right. Trust me, this is the best piece of advice I can personally share. Trying DP (dynamic programming) before getting your recursion and stack calls straight, just to sound cool will end you up in a disaster. I am sure this applies to any field for any profession.

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

Your resume should first, look good. Spend time on alignment, font, size, everything. Keep it short. One pager is good. Only mention your strengths. Remove every word which is not required.

#### **Some personal to-do's :**

- Start Early. Do before everyone else starts competing for it.
- Do what you love.
- Try out different things. Try out random stuff.
- Work Hard. Really hard.
- Believe in yourself.

In case you missed, you can also download his resume. [Click here](#) to download.

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## **GATE CS Corner Company Wise Coding Practice**

Interview Experiences  
Goldman Sachs

## **Goldman Sachs Interview | Set 4 (On-Campus for Internship)**

Goldman Sachs visited our campus for both full placement(NAPA) and internship. I am going to share my experience for internship.

#### **ROUND 1:**

There were in total 41 questions and time was 1 hour. 15 from aptitude and 25 from technical.

aptitude – included data interpretation, basic maths, probability, etc.(tough).

technical – included c and c++ output question, os(scheduling, semaphore), dbms(normal form, etc).

1 essay which topic was "why are you best among all of them?".

I would suggest to start with technical and then aptitude and at last essay. it will save your time and you can do better.

#### **ROUND 2:**

There was G.D in round 2. They divided us in two groups one of 11 people and other of 10 people.

I was in 1st group and my topic was "has technology taken over us or we have taken over technology".

It was of 15-20 minutes. They will give you 2-3 minutes to think.

You just have to say your points and be active , listen to others carefully. Don't be arrogant and don't be aggressive.

15 people got selected for interviews.

#### **ROUND 3:**

It was a technical interview round.

They asked me out my research paper, like what's new in this and how did u get all this. I explained them very well.

Then they ask me one puzzle:-

You have a rod of length 7 and you have to give a part of rod of length of one everyday to a person. so what is the minimum number of cuts you will do , so that you can give him required number of lengths everyday?

Then they asked me some questions related to linux and data structure (graph, etc).

6 people got selected in this round.

By the time my interview completed it was already very late at night.

So they called us next morning.

#### **ROUND 4:**

This round was mixed bag of both of HR and Technical questions.

They asked me what is my favorite topic , i told them Data structure and algorithms.

Then they asked me a tree question:

you have been given a tree(not binary tree), and the last level of the tree is doubly linked list(i.e. first node of that level connected to last node and adjacent to it and similarly for all nodes of that level.). You have to do Dfs.

They also asked questions related to suffix array and tries(which data structure would you use to implement dictionary).

Then they asked some prefix, postfix questions which were followed by puzzles and questions related to data structures.

HR question they asked were "why you have join this college and you really wanted to join this or some other college", "what is your interest and tell me something about yourself".

#### **Tips:-**

- . Learn basic of c and c++ very well
- . Your communication skill should be good.
- . Should know all standard algorithms and data structure(including advanced ds also like suffix array, trie, heap etc).

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## **GATE CS Corner Company Wise Coding Practice**

Internship  
Interview Experiences  
Goldman Sachs

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## **Goldman Sachs Interview | Set 3**

Goldman Sachs visited our campus for both Full Time and Interns. I am going to share the experience for Full Time.

#### **1st Round:**

15 questions : Quant

25 technical Questions (C,C++,DBMS,networking,OS)

45 minutes for both..there was sectional cut-Off

#### **Coding round (two questions)**

1. Check if duplicates exist in an array of N which has range 1 to N.

2. Find a pair of elements in an array that sum up to a given Value K .

We were supposed to do coding questions in 30 mins, there was no compiler.

Finally a stupid "Essay" – "Why I am a good fit for Goldman Sachs?" (10 minutes)

Total 7 people got shortlisted from 1st round

#### **2nd Round: Group Task**

They gave us a hypothetical situation, that a ship is sinking, it has only one life boat and its capacity is only 8 and there are 12 members on the ship and each member has different profession and has a tool or an instrument that can be used for their survival.

We need to discuss and select 8 people out of 12. (Basically you have to fight for your choices and convince others).

4 got short listed after this round

#### **3rd Round: Duration (2hrs), Technical**

1. How JVM works? (He asked internals)

2. What do you do in your free time?

3. Pattern matching question.. He was not satisfied with KMP algorithm..then I told him Trie..he asked me to implement Trie...(code)

4. How would you search a file in Linux I told him grep and sedcommads...he was ok with it.

5. When a message arrives at network interface card what exactly happens after that, and what is Operating system's role in it?

6. He asked me some questions in Perl..he wasn't that good with perl language ...he was nodding his head with whatever I was telling him.

7. Minimum window problem of strings. (we have to search all characters of a string that occur in another string with minimum window)

8. Some simple questions on Python. (I mentioned it when he asked me what are the languages you have learnt)

9. Which one is more efficient a Join operation or a nested query.

10. Given a set to 3 tables transform these upto 4th Normal form....even I don't know how I managed to do it. (m not that good with data-bases)

**4th Round: (Duration 1hr 45mins), Technical**

For this round previous guy sent a guy who know perl..this round was majorly on Perl and UNIX commands.

1. Tell me about yourself.
2. Given a file with business Date and contents. Extract the date(Validate it) and count all the other records in the file. (he was focusing on some basic pattern matching skills in Perl).
3. Check if a given IP address is valid or not.(Do it in perl using regular Expressions).
4. Check if a BT is BST or not.
5. There are 12 rats, 11 of them are trained to eat at fast rate except one. With minimum number of bread loafs I need identify the slow rat.
6. The classic puzzle to find where is the 1 rupee when 3 friends visit a restaurant and pay 10 Rs each
7. Write a perl and awk script to get the permissions of a file or a directory. (this was the easiest)
8. Given a BST but two nodes have been swapped, I was supposed to identify the nodes...then he asked me to rectify it as well. (code)
9. Some operating system questions, virtual memory, why we use virtual memory, File system related questions.
10. Project related questions.
11. He asked me do I know about Object Oriented python.(I said yes)..he didn't ask any question about it.
12. Use linux commands to find 10 most frequently occurring word in a file.  
(sort -filename | unique -nc | head -10 | awk {print \$2})

(I think I nailed this round)

=

**5th Round: (45 mins), Technical:**

1. How will you detect a cycle in a graph?
2. Why Goldman Sachs?
3. Given two stacks implement a Queue. (code was required).
4. Give me "Mathematical Model" for Bubble sort... I was confused what is mathematical model..I asked him does he want the finite automata or workflow sort of answer..he said no, I want a single equation like  $(a+b)/2 = a^2 + b^2 + 2ab$  this formula works for all values of a and b..he wanted me to come up with one line formula...I gave him one..he was satisfied
5. Now he asked to give mathematical formula for above stack Queue question(ques # 3 above)...I couldn't come up with a single line equation.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

## [TopTalent.in] Exclusive Interview with Shweta, who got a job at Goldman Sachs



Armed with a B. Tech Degree in Information Technology from NITK, Shweta Shrivastava has secured herself a successful future in Goldman Sachs. Harnessing her skills through a plethora of projects and actively participating in various extra-curricular activities, Shweta built a strong resume. She worked as an intern for Goldman Sachs and sure enough, secured a permanent offer from the most recognized investment banking firm. TopTalent.in brings you the important interview tips and strategies that Shweta has to share. You can [login](#) and download her CV from TopTalent.in.

**TopTalent:** What makes Goldman Sachs so special? Why did you decide to join?

**Shweta:** Goldman Sachs is one of the leading companies in the world of investment banking today and an amazing place to work for. I had the opportunity to work here as an intern for two months after which I was hired as a permanent employee.

**TopTalent:** Can you describe the complete hiring process?

**Shweta:** I was recruited as an intern here in my third year. The hiring process is exactly the same as any other company which comes for campus recruitments. There's an aptitude test in the first round followed by GD and finally personal interviews.

**TopTalent:** What is your strategy while answering tough questions?

**Shweta:** In any interview, whenever you come across a tough question you're unsure about, the best thing to do is to honestly tell the interviewer that you don't know the answer rather than trying to give senseless answers. It is very important to stick to context. Always keep your answers short and to the point, don't beat around the bush. However you could always tell them what you think is right and back it up with an intelligent explanation. Say you're not very sure but logically this should be the answer.

**TopTalent:** Can you talk about what resources did you refer to before the interviews? What tips would you give to students sitting for interviews?

**Shweta:** Before the interviews, you don't particularly have to prepare for anything. Your ability to answer the technical questions that they ask depends on your overall knowledge and can't be achieved by last minute preparation. In any interview, the most important thing that they look for is your presentation. They know you are smart, having cleared the aptitude test and GD; otherwise you wouldn't have made it there. What they want to see now is your personality, your communication skills and your confidence. So whenever you're going to sit for an interview, just relax. Always be yourself. Don't portray a fake personality just to create an impression. The people hiring you have been conducting interviews for years and will easily spot the deception.

**TopTalent:** What were some important factors according to you that made you stand out?

**Shweta:** According to me, the most important factor that made me stand out was my appropriate level of confidence. Not only is it important to be confident, it is extremely crucial to never be overconfident. You should know how and when to say what, how to tackle questions, how to make a connection with the interviewer. Remember, all you have is ten-fifteen minutes. Do your best. Don't be tensed. Don't be too nervous. Take the interview as a conversation and not as a question-answer session. And always be yourself.

In case you missed it the first time you can [login](#) and [download](#) Shweta's resume from [TopTalent.in](#)

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs

### Goldman Sachs Interview Experience

#### Super Day Process

**1st Round** – Written test to be completed in 1hour 20 mins containing questions on C++, SQL and Aptitude questions. The questions were really tough and considering the level of questions one might feel that the company is really technically sound. But believe me as you read you are going to get shocked.(Hint: For Aptitude questions, Please do a reverse solving, because you get 30 mins for 15 apti questions)

#### **2nd Round –**

- 1) Given a matrix with row sorted and column sorted, find the number given
- 2) What is head and tail command in UNIX ? How does it work?
- 3) What is copy constructor ? Write its syntax ? Brief about virtual functions and real time use case of it.
- 4) Different storage class and scope of variables.

This round is the most funniest – Believe me the interviewer was the Vice-President of the company and he did not know the basics of Operating system. It was kind of very irritating to talk to such people in the interview. If their package wouldn't have been good, I would have made him realize the current era

#### **3rd Round –**

- 1) Lots of discussion on project.
- 2) Write a code to crash OS ( After listening to this question, I was shocked ? What does he actually want ? ) I tried to answer this. Then finally he says write calloc in an infinite loop ( Now you all get and believe me this is a technical answer from the vice president of technology division of GoldMan Sachs and in US they compare them with Google. LOL )
- 3) Discussion on threading framework.

This is not it. This was actually the super day where they filter people from the crowd.

Now the actual interview with the team starts.

#### **4th Round –**

- a) Implement a max stack using one stack(Hint: Use amortized analysis) and don't use two stacks to solve it( I solved using two stack and finally optimized space and he told me to write the complete code
- b) Question on Trie data structure – I don't remember the question but it was a direct question

#### **5th Round-**

- a) Find the number ABCD such that when multiplied by 4 gives DCBA.
- b) How would you implement const member function of C++ in C ?
- c) What is copy constructor ?
- d) There were many questions from C++ and design of my projects.
- e) Intersection of linked list

#### **6th Round –**

- a) Pirates and Gold Coin Puzzle
- b) Take the 4 men across the bridge and only 2 can cross(simple puzzle)
- c) Measure 90 and 50 kg of sugar using 7 and 2kg of weight and you can use the beam balance only thrice.
- d) Reverse a string code
- e) Again many questions on C++ in this round too

#### **7th Round –**

- a) Final Round by the manager of the team
- b) Asks the puzzle of heavy coin and told me to generalize the same. I solved the puzzle and generalized it.

Again the manager was the vice president, who dint know what a ceil function was since the generalized version of this puzzle was ceil(log n to the base 3)

Finally after so much rounds, he says will you join the support profile ? I was like what a support profile. I told him no and believe me my interview was 95% correct. So please be aware of GS, they call for C++ and they finally offer support role.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs  
Interview Experience

### [TopTalent.in] In Conversation With Nithin On What It Takes To Get Into Goldman Sachs



Goldman Sachs is well known for their lengthy interview process. There's no denying it. GS interview process is really, really tough but it's certainly not impossible as applicants have proved it in the past and so has Nithin who hails from Bangalore and is studying at NITK Surathkal. He got an offer from Goldman Sachs for a position based in India. He spoke candidly with TopTalent.in on how he got his dream job at Goldman Sachs and what helped him win this unique opportunity many would die for. When asked about how he felt after knowing that he was one of the two lucky candidates who were selected, a humble Nithin responds, "I was really excited and was bursting with joy. It was a "Eureka" moment for me. The feeling was just fabulous!" The interview acts as a filter to determine if you have the necessary skills for the job, if you are motivated enough to do the job day in and day out, to figure out if you will thrive in the company's culture and if the company is a good fit for you. It's best to first figure out why you want to get into this company by questioning yourself about all these aspects. As Nithin mentions, "Unlike other companies, there was no aptitude test. Candidates were shortlisted based on their Resume and CGPA. CGPA does matter but generally they were looking for spikes or an X factor in a resume. Top 10-15 from each of the circuit branches (Electronics/Communication, Computer Sciences/Information Technology) were selected for the interview process."

GS interviews are quite grilling and highly technical and the interviewers get the best out of you. "There were 6 rounds of interviews, 5 were technical and 1 was an HR interview. The questions were mostly focused on algorithms and concepts of probability", he recalls. As we have heard GS has a consensus based hiring process in which all team members would interview you and you get selected only if all of them vote positively on you. Successfully navigating through 6 rounds of interviews is highly commendable indeed. So what made Nithin tick through all these rounds and what can others learn from his experience? Well, he puts it straight, "A good knowledge in data structures, design and analysis of algorithms and probability (also Mathematics in general) is very much needed. Also, the ability to communicate thoughts and ideas, in a clear, concise manner, is an indispensable skill that'll be useful in all interviews."

Preparing for your GS interview requires knowing your resume inside out, determining your key selling points and practicing your about yourself pitch. But what's the X-Factor GS always talks about? Nithin believes that more than arriving at the right solution, it is the approach you take that really matters to them. He Says, " I brought up different concepts to solve the questions and I think that really helped me get through. I just never gave up on any problem. Always, put your maximum effort and keep in mind that the interviewers do not always expect you to come up with a perfect answer."

So, how much preparation should one put in and what would be his suggestion to others who are aiming at achieving a similar feat? In his words, the plan seems simple and straight, "I started off with revising the concepts I had learnt through the courses which I had taken in the past few semesters. Also, I had taken a couple of online courses during the summer and it really helped. I strongly suggest everyone to take the Algorithm Courses from – Coursera, Udacity and MIT Video Lectures. Apart from revising the concepts, I solved problems from 'Cracking the Coding Interview' and CodeChef. It really helped me streamline my thought process for the problems posed during the interviews." As Nithin plans to join Goldman Sachs in their Strategies Division, we wish him all the best for this opportunity to work with some of the smartest people in the world.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs  
Interview Experience

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



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](#) 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](#) 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!

**Team TopTalent: What was going through your mind when you had to choose one out of those 6 offers?**

**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.

*(Wasn't really a surprise for us. Google seems to be the [first choice](#) for most Indian programmers)*

**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 problems, 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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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Amazon  
Goldman Sachs  
Google  
Interview Experience  
Microsoft  
Samsung  
Tower Research

## Goldman Sachs Interview | Set 1

**Written test:**

It comprised three papers that were held back to back and took approximately three hours. The first two papers were subjective.

....First one tested us on the concepts of probability. I don't quite remember the questions but one of them asked us to find the Eigen values for a given matrix

....Second one tested our coding skills. Few of the questions I can recollect:

Given a set of numbers, find the pairs whose sum is divisible by k.

Given a number find the next largest palindrome number (e.g. if number is 100 then the next largest palindrome is 101).

....The third paper tested our knowledge of computer science subjects. It was mainly focused on Networks and required us to know the basics of TCP/IP, time to live (TTL) etc.

**Interview Round:**

1) Tell me about yourself. (This was totally unexpected!)

2) Find the probability that three points chosen on a circle lie on the same semi-circle.

3) In a matrix a saddle point is defined as the point such that, it has the maximum value in a corresponding row and the minimum value in the corresponding column. Given a NXN matrix find the maximum possible saddle points.

4) Given that you toss a fair coin, what is the expected number of tosses required before you get n consecutive heads?

This article is compiled by **Vikram Goyal**. 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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Goldman Sachs  
Interview Experience

### IBM IRL Interview | Set 1

Following are the details of IBM IRL Interview.

#### Technical Interview 1:

1. Tell me about yourself.
2. Asked favourite subject, I told Algorithms & data structures.
3. Asked Vertex cover problem. I explained the brute force method. But don't know better solution.
4. Implement queue using 2 stacks.
5. Time complexity of DFS, BFS, Kruskal, Prims.

#### Technical Interview 2:

1. Again tell me about yourself.

This time there were lots of good questions from my project.

2. Again asked about vertex cover problem. This is NP hard problem. So no exact solutions exist, but approximation algorithm can be applied. We have to first find the maximal matching edges, then we will put all this pair in the list, remove one by one and check whether by removal of this it is vertex cover or not. For details see Wikipedia for vertex cover.
3. Many questions related to process scheduling. I explained all the scheduling algorithm like FIFO, Round Robin, SJF, SJRF. Then he asked about the detail pro and cons of each scheduling approach.

Don't remember more questions.

4. At last he asked me do you want to do Phd or MS?
5. Why IBM IRL (research profile)?
6. I asked many questions about IBM's financial support for further higher studies etc.
7. How can I be at IBM and also doing Phd, will IBM allow for that?

**Tips / Advice:** They were looking for strong grip on Algorithms and data structures, also in graph, so prepare it well.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
IBM-IRL

### Yatra.com Interview Experience | Set 6

There were total 4 rounds:

**Round #1:** This was written round 2 output and 2 coding questions.

output questions were related to inheritance and run-time polymorphism

coding question #1 : find 2 largest number in an array covering all edge cases

coding question #2 : Given 3 arrays which are sorted find the numbers which are common in 3 arrays

**Round #2 :** This was technical face to face round and questions asked were:

- > write a code to reverse a linked list
- > rotate a 2D-matrix by 90 degree without using extra space
- > given an array find two elements whose sum equal to zero

Round #3 : This was also technical interview and questions were:

- > reverse the elements of stack without using another stack, queue and array
- > In a binary tree find the left facing elements with recursion and without recursion

->

**Round #4 :** This was managerial round

- > Given a table with (empId, deptId, Salary ) make a sql query which list the maximum salary for each department.
- > Asked about myself and given a situation like you have different point of view than your manager so in that condition what will you do
- > Why you want to leave your current company.

As they said to me after 1month that now they dont have any open position current for fresher but since my interview were really fine so they given me one chance for

interview for position one higher than i applied:

**Round #1 :** This was again tech round and questions asked

- > Given a table (EmplID, Salary) make a generic sql query so that i can get the nth highest salary.
- > Rat in a maze problem
- > Given 2D array horizontally and vertically sorted find a given element.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Yatra.com

### Yatra.com Interview Experience | Set 5 (For Software Developer 1)

1. On Thursday i got a call from some consultancy for the job. Asked me basic things like current work, current ctc, etc. I asked him about the profile, its a good habit to always know which job are you looking forward. He told me i am the first person to be asking about the profile, others just said yes straight away. He then explained me JD(job description). This also helps consultancy guys to see if any other job fits you.

2. Got a mail on Friday for f2f on Saturday.

3. There were about 15 aspirants. Some freshers and some with around 1 year exp.

Following is my experience:

#### 1st Round:

Written round. 20 MCQ on outputs, oops, java, etc.

3 subjective.

A. One was to compress a string. For ex. i/p string is aaabbbbcc then o/p is a3b4c2

Totally working code with all the corner scenarios handled was expected.

B. Don't remember the Second question, but it was super easy then the first.

C. Third question was optional. They said who know can answer. Question was to differentiate between hashtree and hashmap in java. I left it blank.

#### 2nd Round:

A. Detailed discussion on round 1 string compression.

B. How to check if a binary tree is BST

C. Asked me about myself. I asked him the office culture. Asked him about work they are planning for new joinees and how are they planning to onboard them with yatra(trainings and all). Asked him about office hours as well

#### 3rd Round:

A. He asked me BST question from previous round. I told him its done already

B. Cloning a linked list with random pointers

C. A base string is given, lets say helloworld. Stream of sample strings are coming like oworldhell. I had to tell if the sample string is a rotation of base string.

D. Then i asked him about his experience in yatra

#### 4th Round (hiring manager):

A. Notice period

B. Current ctc

C. Expecting salary

D. Apart from work, what did i learnt at my previous company

E. Biggest mistake of your 1 year in previous company

F. What will you do in a conflict with manager

G. Team lead has provided a design, you yourself created another. How will you persuade team to follow your design

H. Your latest conflict with team/manager. How did you tackle it.

I. Asked her questions about work i am expecting with this job. Asked her why hyderabad office has just 30-40 employees. Asked about her experience.

Hiring manager explicitly mentioned she likes full stack people. In my current company, same is the case. I told her about that. She liked it.

I thank geeksforgeeks for the preparation. And, very well done with the new UI. Really appreciate it!!

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Yatra.com

### Yatra.com Interview Experience | Set 4

First round : Written Test

The test paper was consist of 20 MCQ from C, C++ Java and some aptitude question and 4 coding question.

Coding Questions were

1. Dutch Flag Problem

<http://www.geeksforgeeks.org/sort-an-array-of-0s-1s-and-2s/>

2. <http://www.geeksforgeeks.org/reverse-words-in-a-given-string/>

3. Birthday problem

An array is given which contains the age of your friends , if the age of the friend is greater than any neighbor then he will get more chocolate than him. You have to find the number of chocolates for distributing each one.

Ex {9, 8, 7, 3, 2, 1}

Then 9 will get 3 chocolate

8 – 2, 7-1, 3-3, 2-2, 1-1 chocolates respectively

So total 12 chocolates.

4. Rotation of the sorted array through some pivot.

#### Second Round :

He asked me questions from Data Structures and java.

1: We have to check the pattern check for braces.

```
like {{()}} return true  
{}() return false;
```

2. To find the number in an array which is appearing odd number of times.

3. To find the count for each element in array how many number are smaller than this number which appeared previously in the array.

4. Lucky number problem.

5. Dutch flag algorithm.

6. Some questions from BST.

7. Some questions from Java.

#### 3rd round

In the beginning the interviewer said I got a very good reviews for you that you are very good in algorithm. I was like yippeee but then the real story began.

He was throwing the questions from JSP, Java , servlet

He did not want the answers which I know but he was just want what happens in memory all.

He asked me so many questions which were away from my reach then he said, I am done you can leave for the day we will contact you. I knew that I got rejected.

Thanks for gfg for helping me.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Yatra.com

## Interview Experience with Yatra(Hyderabad) | Set 3 (For Senior Software Engineer)

I had a total of 5 rounds.Initially I thought there will be only 3 rounds.

#### Round 1:

1. Rotate a matrix by 90 degrees clockwise.( He asked me have you heard of question.I said Yes.Then he asked me to code)

2. Find vertical sum of nodes present in same vertical line in binary tree. ( He again asked me have you heard of question. I have heard it but didn't remember the approach. It took some time and then I started telling my approach.He asked me to write code and question regarding get sums from left to right , for which I made use of linked hashmap)

Overall It was very cool for me

#### Round 2:

1.Reverse K blocks of nodes in linked list.

There are two interviewers this time, probably, guy was senior he was asking me question.He was very particular in coding. Checked every edge case.and asked me everything.Initially I told the approach and then started coding.

2.Find min in stack in O(1)

Pretty straightforward written code.Again he checked all edge cases with my code.

3. Then asked about counting sort and its code.

4. And a simple question on array sorting.

#### Round 3 (Manager round):

I thought this was last round as they have said like. She asked me about my strengths and challenges I faced. How I overcame through it

1. Basic question on oops concepts. (runtime polymorphism).

2. Design tables for getting all employees under manager. I screwed it little bit. But some how I got answer which I was not satisfied as well.

I was expecting result either yes/no. But they called me for another round of interview may be because of my expected salary which was high compared to my previous.

#### Round 4 (Technical):

1. Given "aaabbbccc" it should return "a3b3c3" in place. Initially I explained brute force approach then he said array has  $2n$  space. I was able to remember approach for quicksort and started explaining after which I grew confident on it. He was satisfied. Questions on time complexity of algo and space complexity discussions.

2. Again a question on OOPs. This time I was completely wrong in answering it. I thought interview with yatra was closing for me. He was not satisfied much with this.

Luckily, there was another round with manager.

#### Round 5 (Manger)

1. He asked me to find words which are having particular pattern. Then I said it was KMP algo. Can I explain it ?? I started explaining approach, may be he was busy with something, he asked me to write pseudo code. He left the room for 15 mins then he came back I had almost completed the code, which he was satisfied.

Some basic questions on spring (my previous work was related to it). Then my expected salary and my position if I got selected in yatra were discussed.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Yatra.com

## Yatra.com Interview | Set 2

I appeared for yatra.com interview process. In each round, I have to discuss the problem with interviewer and to tell him my approach. Also they asked About complexity of each solution and also stressed to optimize it

#### Round 1 ->

- Given a Matrix with 0's and 1's in sorted order. design an algorithm to return row index with maximum number of 1's. after That he modified the ques that some rows are sorted in increasing order and some in decreasing order.
- Given two arrays of  $n+m$  and  $n$  size.  $n+m$  size array only have  $m$  elements and  $n$  size array have  $n$  elements. Design an algorithm to shift smaller array element in larger array also larger array should be sorted. interviewer asked to give 3 different algorithms.

#### Round 2 ->

- What is Hashing, Hash table.
- Algorithm for Level order traversal of BST without using Queue Data structure.
- Given an array with +ve and -ve numbers. Give an algorithm to find 3 numbers having sum  $x$  in less than  $O(n^3)$  complexity.
- Binary search.

#### Round 3 ->

- Given a file with all 255 chars in it. design an algorithm to check whether this file is parenthesis balanced or not.  
(file handling question)
- HR questions.
- Discussion about current company work and my responsibilities.

After 3 days i got the offer letter. Do a lot of work on complexity optimization.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Yatra.com

## Yatra.com Interview | Set 1

Recently I had appeared for Yatra Interview. I would like to share my experience.

#### 1st Round: (Technical Round)

- Tell me about yourself and your current company work.
- Find whether two strings are anagrams of each other or not. What would happen if strings are very large.
- Level Order traversal of a binary tree.
- Given an unsorted array: Print all pairs having sum equal to given sum. After solving this, question was modified NOT to print duplicate pairs.

#### 2nd Round: (Technical Round)

- 
1. Tell me about yourself and your current company work.
  2. Find whether a binary tree is BST or NOT.
  3. Design a stack with findMax() (getting maximum element from stack) in O(1).
  4. Given a binary tree, find whether all leaves are at same level or not.
  5. Check whether given linked list is palindrome or not. Write optimized code handling all edge cases.

### 3rd Round: (HR Round)

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1. Normal HR Questions.
2. Difference between HashMap & LinkedHashMap.

After few days, I got the offer :D. Thanks to GeeksForGeeks for providing solutions in a very simple manner which helped me a lot in the preparation. To crack Yatra interview, Data Structures and Algorithms concepts should be clear. Knowing Java/C++ is a plus point.

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.

## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Interview Experience  
Yatra.com

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## Drishti-Soft Solutions Interview | Set 7 (Off-Campus)

Had applied Off campus. They had asked us to bring our own laptops.

### Round 1 – Online round.

3 hours

30 MCQ questions based on Quantitative aptitude. ( Ideally to be done in 30 mins)

Questions on Profit-Loss , Ratio , time-work, volumes – surface area. The level of questions was high.

4 Programming questions – Choice was between C and Java

Q1 was very easy. We are given a no 'n', we need to count how many times 2 comes between 1 to 'n' in that range.

eg : – 19 . Between 1 – 19 , 2 , 12 contain 2 so the answer will be 2.

My approach was using modulus, check each digit and put this in the loop.

However 8/10 cases passed.

Q2 was dynamic programming. Find the length of the largest subsequence which first increases and then decreases. eg : – 8 1 2 3 4 5 6 7 6 5 . In this case length will be 9 . 1 -7 increasing and 6-5 decreasing.

I was clueless, how to do this question.

Q3 – Linux file system structure program.

We were given that the following directories already exist . we had to find out how many mkdir calls we need to make. The directories were taken in the form of 2D character arrays. Say :

home , tmp

so for the path

/home / abc – 1 for this (1 mkdir call for abc because home already exists)

/ temp / xyz / wvu – 2 for this ( temp already exists , 2 mkdir calls for xyz, wvu)

Q4 : A program to reverse a linked list till k nos was given . We had to find the bug in it . Run time error was coming .

The insert function in the list was entering this way

eg : input is 1 2 3 4 5 6 7 8 9

The values were getting entered in the list as

9 8 7 6 5 4 3 2 1 . Head pointing to 1

Our expected output for 1 2 3 4 5 6 7 8 9 with k = 4 ( The no till which we need to reverse)

4->3->2->1 ->8->7->6->5->9->8

Basically a no k was given till which we had to reverse.

### Round 2 was Debugging round.

Rat in the maze problem was given . A person could go only 4 directions from the maze.

It was something like :

ABC decides to make cube but only has the budget to make a square maze. Its a perfect maze, every room has a square base and there are 4 doors (1 on each side of the room). There is a big number written in the room. A person can only move from one room to another if the number in the next room is larger than the number in his current room by 1. Now,ABC assigns random integer numbers to all the rooms and then places S<sup>2</sup> people in the maze, 1 in each room where S is the side length of the maze. The person who can move maximum number of times will win. Figure out who will emerge as the winner and the number of rooms he will be able to move. In case there are multiple such people, the person who is in the smallest assigned number room will win.value of integer directions. It was taking us diagonally. We are allowed to move only top down left right. Boundary condition was also being violated, we had to put the ifs. Also the function wasn't modifying the values so we had to store value in array rather than local variables. It was calculating the MAX..but the condition was put that of MIN. Also we had to modify the VISITED array.

The round lasted for 2 hours. 4:30-6:30.

They gave us dinner. Then Design round started.

We had to design a client server application in which client was sending to server and server was returning to the receiver.

A server.jar file was also given.

this lasted till 11:45 PM. Started around 9:30

#### Next day Project round.

It was very rigorous. First he asked for overview of all the projects done in engineering so far. On a piece of paper, had to explain him the workflow. He then asked to choose 1 project of choice and went into details. He asked to write the code of various modules / classes on a piece of paper. He then asked detailed questions. Focused mainly on error handling. Lasted for 2 hrs.

#### Last Round was HR

Just a general discussion on strengths weakness , family , goals in life.

All the interviewers very friendly and helpful

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Drishti-Soft Solutions

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## Drishti-Soft Solutions Interview | Set 6 (On-Campus)

DrishtiSoft came to our college. Here is my interview experience. There were total 5 rounds.

#### Round 1 (3 hours):

section 1:

30 Aptitude questions.

section 2:

2 coding problems:

1.Given mathematical expression in form of string.Evaluate this expression.

2. given five types of mirror having some reflecting edges and are placed in n\*m matrix and a direction from which light can incident on the matrix. you have to find the total cells which will be in the dark.(hint: use dfs in all the directions).

1 debugging problem:

min cash flow problem from geeksforgeeks.

1 designing problem:

we were given a functionality to implement and some functions were already implemented. we have to read the code and to complete the

2 functions.(problem at the first sight seems to be hard but give it a try as it was the simple one).

out of 190 21 were selected.

#### Round 2 (1 hour) :

It was debugging round. we have to debug the rat maze problem of geeksforgeeks.

out of 21 13 were selected.

#### Round 3 (5 hour):

It was a Designing round.

In this they had made a server which manipulates the conversation between the sender and the receiver. we have to make the code which can fix this bug but we cant change anything in the server.

after fixing the bug we were asked about the networking concepts which can be applied to this problem.

out of 13 6 were selected.

#### Round 4 (2 hour):

First they started the discussion about OS. all the concepts related to process synchronization, critical section problem. Asked to write the code about producer consumer problem. Concepts related to memory management .

After this they started discussion related to my projects.(whether they know about the project or not they will come up with a question which you haven't thought while making your project so be well prepared with your project).

out of 6 4 were selected.

#### Round 5 (30 min):

It was HR round. there was only general discussion and some standard HR questions.

PS:If you want to clear Drishtisoft interview geeksforgeeks wont be enough as there were only two questions asked from this.It is programming skills which can help you to sail through this.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Drishti-Soft Solutions

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# Drishti-Soft Solutions Interview | Set 5 (On-Campus)

Drishti Soft Solutions Interview Experience (On Campus):

## Round 1: (3 hours)

Section 1: 30 general Aptitude MCQ questions.

Section 2: 2 coding questions, 1 Bugger question and 1 API design.

1) Given 5 types of mirror

- 1st reflects the light in left if light coming from top and visa-versa.
- 2nd reflects the light in right if light coming from top and visa-versa.
- 3rd reflects the light in right if light coming from bottom and visa-versa.
- 4rd reflects the light in left if light coming from bottom and visa-versa.
- 5th blocks the light.



Input: Given matrix filled with 1, 2, 3, 4, 5(represents types of mirror) or 0 (represents dark area). Also given initial direction of incoming light (top, bottom, left or right).

Output: Remaining darker area in the matrix.

2) Evaluation of Infix expression. <http://www.geeksforgeeks.org/expression-evaluation/>

Example:  $2 + 3 * 4 = 14$

3) Bugger question: There was some logical error in the question given below just debug them.

<http://www.geeksforgeeks.org/minimize-cash-flow-among-given-set-friends-borrowed-money/>

4) APIs design (Module writing)

All questions were to be attempted in C or JAVA. 21 were shortlisted from 200 students

## Round 2: (Bugger Round)

All of us were provided with C/Java (option) code on PC's.

We were asked to understand and explain the algorithm of the code and then to find out the errors and correct them. Then interviewer ran his own test cases to check the code. The interviewer attended every one individually.

Question was similar to the rat in a Maze problem.

<http://www.geeksforgeeks.org/backtracking-set-2-rat-in-a-maze/>

Tips: Take time and understand the code properly and cover all the test cases .Stick to the code and don't change the complete code.

13 students were shortlisted from this round.

## Round 3: (Design Round)

This was the toughest round as it covered the practical implementation of concepts like packet data transfer from networking part, cryptography techniques.

Problem Statement: There are two province Jaipur and Mewad both are communicating by messenger. The province Jabalpur is server which alters the message between the two provinces.

We were given code of connection between sender and server and server and receiver. Firstly we were asked to understand and explain the given code .I told my approach and he seemed satisfied with it at once. Then I was asked to implement it and write a client program that checks the correctness of the message (messages received were either not in order or there was duplicity).

This round lasted for about 3 hours. 6 among us were selected after this round.

## Round 4: (Project Round)

First I was asked to explain my project. He went through it thoroughly. He also asked me to write a module of my project and find BUG in it. I gave him many approaches and he seemed satisfied at last.

And he also switched in to the design round question in between and asked how you will communicate if there is no server between sender and receiver. Again my approach seemed good to him.

The round went for around 2 hours. Finally 4 students were shortlisted after this round.

## Round 5: (HR Round)

As I entered he asked if I have any question related to the company, the work it does. Since I had visited the company website before, I asked about the difference in the approaches for designing different product.

The he asked me about educational and family background, strengths and weaknesses.

Luckily there was no language barrier which helped me a lot. Most of my conversation went around in Hindi.

Thanks G4G for making me thoughtful.

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Interview Experiences  
Drishti-Soft Solutions

### Drishti-Soft Solutions Interview | Set 4 (On-Campus)

Drishti-soft solutions came in our college.here is my interview experience. There were total 5 rounds

#### 1. First round

It was an online round. It comprised of two sections.

In first section, there were 30 MCQs and were supposed to be solved in 30 minutes. It included only quantitative aptitude questions.

Second section was PROGRAMMING section. It consisted of 4 coding questions.

The PROGRAMMING sections had three sub sections: FRESH CODING(2 questions), API CODING and DEBUGGER.

1. Given a number m,u have to print the maximum value after 1 swap.

e.g. m=5482 prints 8452 .you can use only one swap for any two numbers .

2. Tees Mar Khan (problem name) :-given a matrix , you have to rob maximum value . you have to start at topmost left corner and reach to last corner. you can move either right or down.if any house is robbed then u can't robbed next right or down house (i.e. adjacent house).you can rob diagonally located house

3. The subsection DEBUGGER expects you to understand the given code and fix the bugs.the problem is Sudoku Checker

4. API coding related with trie. u have to complete some functions .I don't remember the question.

Test was of three hours.

18 students were shortlisted after this round.

#### 2. Design round:-

It consists of a networking problem and u have to complete the problem with given constraints.

Basically u have to transfer a file from sender to receiver line by line using server as intermediate.They have already implemented the socket programming and we had to complete the sender and receiver code.

#### 3. Debugging round:-

This round contained one question. You have to understand the problem and you have to debug it.The problem is reverse DNS lookup.

After these two technical rounds, 11 students were shortlisted for next round. I was one of those lucky ones.

Second last round started at 9.00 p.m. and ended at 10.10 p.m.

#### 4. Project round:-

Discussions on college projects, about my internship which I had done in Mebelkart.com.Then he gave me a case of online test website.

I have to design the DBMS structure .I designed the DBMS structure . Then he added some constraint and I had to change the DBMS structure to satisfy the given constraints.

Last round started at 10.20 p.m. and ended at 12.10 a.m.

5. It was a HR round and he discussed about my college life.

All interviewers were very friendly.

Thanks to geeksforgeeks team

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Drishti-Soft Solutions

### Drishti-Soft Solutions Interview | Set 3 (On-Campus)

This test consisted of two sections MCQ and PROGRAMMING.

The section MCQ had 30 questions and was supposed to be solved in 30 minutes. It included only quantitative aptitude questions.These MCQs were of medium level.

The section PROGRAMMING had in total 4 questions was supposed to be solved in 2 hours and 30 minutes.

Q1.(Fresh coding) MAGIC NUMBERS-

Given numbers from 1 to infinity(1,2,3,4,5,6,...)...first remove every 2 position number resulting in 1,3,5,7,9,11,13...then remove every third position number resulting in 1,3,7,9,13...then every fourth position number...then fifth...then sixth..then seventh and so on.We were given a integer as input and we had to determine whether this number was present in the final list or not.

Q2. Standard Josephus problem(i was using recursion in the code,but it resulted in run time error,So i was forced to write the iterative version).

Q3.Debugging round-This section was tough and the given code was also long, than expected.A NxM matrix(consisting of only 0 and 1) was given and a routine was written to find the number of squares,whose all four boundary consisted of only 1's.The sizes of squares .varied.Our job was to modify the code slightly(not heavily) so that it gives the desired output.

Q4. API coding(Toughest of all) Few directory path (of linux) were given.We had to determine the number of times we will use "mkdir" command to create a particular folder.Prototype of all functions used, were given in the code.Using these functions we had to write the code.It was tough,as the whole code was implemented using pointers and the given prototype was also long.

The only drawback was that C++ was not allowed, only C and Java. As C++ STL was not allowed, it was quite tough to handle the code.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
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### Drishti-Soft Solutions Interview | Set 2 (On-Campus Written)

This test consisted of two sections MCQ and PROGRAMMING.

The section MCQ had 30 questions and was supposed to be solved in 30 minutes. It included only quantitative aptitude questions.

The section PROGRAMMING had in total 4 questions and was supposed to be solved in 2 hours and 30 minutes.

The PROGRAMMING sections had three sub sections: FRESH CODING, API CODING and DEBUGGER.

1. The subsection FRESH CODING expects you to solve given problem and write your code.

Program given was:

SERIES ABCD.....XYZAABACADE.....AXAYAZBABBBCDBE....BXBYBZCACBCCCD....CXCYCYZ.... AND SO ON

Input(a) is from  $0 \leq a \leq 9999$ ; Output should be alphabet from the series, corresponding to the input.

INPUT: a=30

OUTPUT: B

input: a = 27

output: A

2. The subsection API CODING expects you to understand the given code and complete it.

Program was : from the given subset, find out the two subsets whose sum of elements are equal.

e.g

subset:{4,2,1,1,5,3}

subset1:{4,2,1,1} and sum of elements is 8

subset2:{5,3} sum =8

3. The subsection DEBUGGER expects you to understand the given code and fix the bugs

Test was of three hours and was continuous.

HR explained about the online test and gave a pamphlet that had the description of coding questions

Programming languages that could be used were C and JAVA

No negative marking was there.

There was no technical mcq question.

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## GATE CS Corner Company Wise Coding Practice

Interview Experiences  
Drishti-Soft Solutions

### Drishti-Soft Solutions Interview | Set 1

Location: Gurugram

Position: Software Developer

I decided to write this post because when I was preparing, I didn't find any help on Google about the interview process by Drishti-soft, so I thought that since I bagged the job I might as well help those who are like me in a similar situation .

So, when Drishti came to my college I didn't know anything about the company nor even heard of it before even though one of our seniors got placed in it. Well it came with a big package so I was sure I was gonna sit for it since the package was lucrative and it was a technical company which is my type.

First round started and since I was on time I found a seat near one of my friends. First they made us fill some forms including some feedback forms and personal details after that using our Facebook ID they made us log in and told us to start the test.

**1st round : 2 Tests : aptitude MCQ and coding MCQ.**

I feel like the questions were good so needed more time than what was given to us. Well as there was no negative marking I tried to answer as much I can. Some of them based solely on my gut feeling. In coding MCQs, questions were of medium size codes and we had to check for error/output for it. Some questions also asked about time complexity as well. In coding MCQ also I personally felt time given was less but was challenging.

After first round they gave us a PPT for their company which was one of the best PPTs I had till now and the work ethics they had I liked them a lot. Those were like of

what I thought of my dream company to be like and only difference was my dream company is a Game Development Company and the motivation speech about career guidance was so good it motivated me a lot. Most of the things they said were the things I think are right so I started to like them and started to develop a genuine interest in the company.

Result of first round came. I was playing DOTA 2 at that time which I do most of the time so I missed the results but luckily Shailesh Gupta, told me I cleared 1st round. I checked and went running to the Computer center for the next round with just a pen and in my mind I was thinking that since I was late they wouldn't let me sit for the second round. When I reached there they were cool about it and they tried to find me a place but in the lab where test was taking place, there was no PC available so they asked me bring a laptop or find one. I could not go back to my hall to get one and no one else brought there laptop so they made me sit separately in another lab where I was the only one who was giving the 2nd round.

**2nd Round: Subjective Coding round :** 5 Coding questions :-3 of 1 marks and 2 of 3 marks

Q 1: Check that the number can be divided by the sum of its digit. (Easy as it can be)

Q 2: A girl counting on her left hand's fingers, u need to tell on which finger she will stop for a giving number. Counting was like 1-thumb, 2-index finger , 3-middle finger, 4-ring finger, 5-little finger then 6-ring, 7-middle , 8-index, 9 thumb , 10 -index and so on ..(easy like hell )

Q 3: Gcd of two numbers ( again ..:)

Q 4: Remove duplicate from a sorted linked list . (was easy and as linked list was already sorted so it become more easy)

Till now all question i find were easy did these in 20-30 min, I had almost 1 hr left.

Q 5: given an array using in-place operation u have to put odd number in odd indexes and even number in even indexes. Assume array of even length and half of it will be even numbers (seems easy but as u cannot use another array and the order of number should not be change it was a good question took me while to implement the solution i think of)

Next round was in their office in Gurgaon. They told us to take reservation in Tier-3 and all transportation expenditure will be compensated. Out of the 9 people selected, 7 of us were there, as we reached there sooner than scheduled so our interview also started 1 day earlier.

**3rd Round : F2F coding round:**

I was expecting an interview but when the sir came he asked my name and started giving problems. This round was 4-5 Hr long start at 5pm end up at around 10pm. I don't remember all the questions. Here is what I remember, you have to write code on paper:

Q : Given an array of size (b-a+1) with number from a to b in sorted form. One number is two times. You have to find out the missing number.

Q : Given a sorted 2D array, find a number in it. I knew the question but don't remember even a single solution. I tried a binary search in a 2D array but failed with it then gave a solution which choose direction and move in it. my solution was not that efficient but i did what i can .

Q: Given a binary tree, make a linked-list out of the leaf node of that tree. easy did this one in 5 min .

Q: Given 2D array with weight in each box, u have to move find minimum weight (total weight &gt;=0) in the shortest path (path can be a long one but weight should be minimum) between 2 point given to you.

Q: <http://www.spoj.com/problems/ACODE/>

4 selected out of 7 after the 3rd round

**4th Round: F2F analytic round:** this was the hardest round I faced in my life!!!

Q. Pipe one fills a tank in 15 hr another fills in 20 hr (time could have been different) and 3rd empty in X hr. if all work together tell the max value of X for which tank will never be full. (easy :P)

Q. 13.1.13 is special because date\*month =year find the year in this century which have max no of such dates. (I think answer is 24) NOW the HARD q comes

Q. 9 student have either black or white cap on them (cant talk to each other) black >white>1 teacher gave them 20 min no one answer then teacher gave them 10 min no one answered then teacher gave them 5 min all of them gave the answer. (gave many hints before I could answer)

Q. You have 2 ball of each A,B,C colors and each color have 1 light and 1 heavy ball. all light are same weight same goes for heavy. using balance (Scale) min time how u find weight type of each ball. (first time for me gave me lots of hints a lot then it was like he solved it for me it was already past 00:00 of night now)

Q. There on a island there are 13 A,15 B,17 C animal if two of different type combine 3rd one is created . can there can be a time when only one kind of animal remains? (again he gave a lot of hints till i was able to solve it)

Q. There are 3 doors 1 of them have money other 2 have nothing if first we let u choose 1 door and then open one of the other u didn't choose and show u it have nothing behind u. Now i will let u change what u choose will u change ur choice and choose the one door which is left or stick with your door.

3 out of 4 left now.

**5th round: HR round** which was hard for me as I am not that social and weak in communication but as I went for the next round after 30 min I assume I passed HR round too or may be they considered both the 5th and 6th together.

The final and most important round was about the work you have done during your college such as project work and vocational training.

**6th round:Project discussion and puzzle round** Sir told me about him self and asked me about my interests then he asked about the project which I had done. They did not ask many any puzzle but they asked the 2 others before me. I explained my java UI project I did in summer. He seems quite pleased by what I know. Then asked me some network questions to check that I can answer questions from other topic other than programming.

Q. Public-key cryptography and

Q. question related to Certificate authority.

He asked these when i answered some of his question about my web project and the database I used in it.

3rd round : 4.5 hr

4th round : 3.5 hr (ended at 1:20 am !!)

5th round :1.5 hr

6th round: 2.5 hr (ended at 12:30 am)

Next day the results were announced and in the end I and another guy from my college got the job .

Key to get this job offer : You must be a real geek and not someone who is pretending to be one solely for the job. 12-14 hrs of interview will tell them everything about you whether you like it or not.

I am really thrilled about the work I will be doing there and can't wait to get started. I have an exciting future ahead of me

Source: <http://sunilkumarsheoran.blogspot.in/2013/11/interview-for-drishti-soft-solutions.html>

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# Twitter Interview | Set 1

### Phone screen – I

1. Fibonacci series without using an array – this is a typical favorite question w.r.t. Dynamic Programming where you will asked not to use Memoization or any extra storage to store the values of the previous iterations.

(More complicated version of the same problem: Generate Nth row of pascal's triangle w/o using a 2D array of dimension N x N)

2. N-ary tree : find if a node exists in the tree with value = x. If yes, return true, else, return false.

### Phone screen – II

1. Find the lowest common ancestor of Binary Tree

Answer: Done it a 10 times Explained how to do it !

2. Clone a graph and analyze the time and space complexity (since DFS based approaches leverages smaller time at the cost higher memory)

```
public class Node {  
    public int data;  
    List neighbors;  
  
    public Node (int data) {...}  
    setNeighbors(List neighbors) {...}  
}  
  
// HashMap created = new HashMap();  
  
public Node clone(Node oldGraph) {  
  
    if (created.get(oldGraph))  
        return created.get(oldGraph);  
  
    Node newGr = new Node(oldGraph.data);  
    List nbors = new ArrayList();  
  
    created.put(oldGraph, newGr);  
  
    List adj = oldGraph.getNeighbors();  
    for (Node n : adj) {  
        nbors.add(clone(n));  
    }  
  
    newGr.setNeighbors(nbors);  
    return newGr;  
}
```

### Phone Screen III

Design a bloom filter to remove the duplicates from an unsorted array !

### On-site

1. (Boggle – like question) In a 2D array (M x N, in the given ex. 3x3) of numbers, find the strictly increasing path from the specified origin cell (1,0) to the specified destination cell (0, 2). Array may contain duplicates, and solution should work with the dups.

2.a. Design a unique hash function for every tweet in Twitter which will be used as part of a service.

2.b. Find if a directed graph has cycles or not. Write a function with boolean return type for the same.

3. Casual Lunch interview.

4. Pattern matching using patterns containing chars (a to z) and '\*' , '?' and '.'.

5.a. Describe how would you do external sort -> come to a map-reduce kind of solution. Each machine has 10M numbers (total 100M), 10 total machines. Each m/c has 20MB RAM and 50GB memory.

5.b. N-Queens problem: find and print all possible non-conflicting positions for the Queen.

6.a. Given an input binary tree and reference to a Node in the tree, find next in-order successor for the input node. Output null if none.

6.b. What is the best way to sort a k-sorted array ? Optimize for time complexity.

(My hint: use a priority queue of size k)

7.a. Hiring manager: Design a service for a. Durability b. Consistency

7.b. Explain C++'s problem with multiple inheritance.

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# Open Solutions Interview | Set 1

Name of Company: Open Solutions

Profile: Software/Finance

Venue: On Campus

## Written Test (Time): 1 hour

Sections and type of questions in those sections : there were 2 sections

1 Aptitude – 25 questions

2 Technical – 25 questions

No negative marking

## Technical Interview:

1. Tell me about yourself: start with your place of birth, school, college, then move on to the projects you have done, basically they want to listen about your projects.
2. Asked several questions from one of my projects. Told me to draw the priority graph related to my project. So be prepared for tough questions from projects.
3. Given a link list, sort it by using Quick Sort: he want to see my approach, then I also explained that it can be done easily by merge sort, also write the code for it. (Given in Geeksforgeeks.org)
4. Given a string, reverse it using stack: easy question, but he want me to care boundary case. Then I gave many solutions for this question, one by simply using stack, then by using recursion.
5. Minor discussion on priority queues in general and heaps in particular.
6. Some questions on OS (scheduling etc)

## HR cum Technical Round (Taken by the VP of Open Solutions, he was from the US office)

1. Again tell me about yourself: same as above.

2. One of my projects was Compile time task scheduling for heterogeneous system, so he asked some real good questions of scheduling related to my project. Many tough questions from project.

3. Given a pointer \*p address is 1030 and there is a class whose size is 40 byte, so what will be the address of \*p+1.

4. You have a 100GB disk filled with integers (in records whose size was given, so there was some free space left). You have 100 MB of memory. Come up with an algorithm to sort those integers.

Solution: apply concept of external sorting. Divide the whole list into several small array which can be done in 100MB RAM. All this arrays are sorted separately. Then we apply multiarray merge function and we will get the resulting list.

5. Asked about various OOP concepts. Why polymorphism? Why OOP? Why C++ why not C? How to do polymorphism in C? several other questions on OOP.

6. Puzzle : you and your friend are going in car from Varanasi to Delhi, after covering 100KM your friend does not feel well, he need immediate doctor. Your car stops and not starts again, engine fails, you try but can't repair it. Mobile phone is not working. If you ask for lift they do not stop. If you stand in the middle of road then they will kill you but not stop. Think what will you do to save your friend.

7. One question from their product, he explained all details, then ask to optimize it.

8. Do you want to ask any questions?

You should always ask some smart questions and never ask about CTC. I asked about the work culture, career growth aspects. Then I asked about the products and fields in which they work. Lots of chitchat and healthy discussion.

**Tips / Advice:** Don't feel nervous, be confident, they will check even your answer is right.

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Interview Experiences  
Interview Experience  
Open Solutions

# Fiberlink (maas360) Interview Experience | Set 5 (Online Coding Question)

Question:

Ticket Scalpers:

Given an array of tickets held by n scalpers.

The cost of a ticket at the scalper is equal to the number of tickets at a scalper at that particular moment. i.e if a 1st Scalper has 4 tickets at present then the cost of a ticket will be \$4. After he sells that ticket he has 3 tickets, so the next ticket will cost \$3 and so on.

If N number of tickets scalpers are seated outside a hockey stadium what is the maximum amount they can earn for the first 'k' tickets sold:

Input: Given n (Number of scalpers), given an array which has number of tickets held by each ticket scalper, the value of k.

Output: the max amount that can be earned by them by selling k tickets.

Eg:

Input:

2

2

5

4

Output: 14

Solution:  $5+4+3+2 = 14$

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Fiberlink

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### Fiberlink (maas360) Interview Experience | Set 4 (Off-Campus)

I got a call from consultancy asking me, whether they can process my profile for the position of Software Engineer with FiberLink. My profile got short-listed.

They asked me to appear for an on-line coding test.

#### Initial Round

On-line Coding Test

The test contains only one coding questions.

- Given a string, print all distinct palindromic sub-string .

#### Round 1

- what is singleton?

- write a class for singleton

use case of singleton

- Given an array which contains many elements including repeating numbers.

You have to print repeating numbers

- how do you traverse array

- do you have any questions for me

#### Round 2

- what is your role in current company

- Describe your project architectural overview

- Please go through projects mentioned in your resume properly, they will go into very depth of the project, and try to understand, what actually you have done in your work.

- What is exceptions?

- types of exceptions

- how do you release resources if exceptions does not occur.

- if forcefully system is set down, how do you release resources

I have given answer, by creating a clean up script which contains all resource releasing commands and whenever we require to release resources , we run the clean up script by checking the process id, whether its running in the system or not

- explain database

- In my resume I mentioned junit, so he asked me how do you test multi-threading using Junit

- Given a puzzle,

Given  $10 \times 10$  grid, which is built by using  $1 \times 1 \times 1$  grid, if outer most boundary of  $1 \times 1 \times 1$  is broken down, how many grid will be removed.

- Given a string like ggggaaannnnnwww

o/p:7g4w4a3

write program which will take above input and gives the mentioned output

Please note that in the output 'g' and 'w' has same frequency number but have to print in alphabetical order.

why are you looking for change

#### Round 3

- Tell me something about yourself

- Tell me about your work and projects.Long discussions about the project.

- bridge and torch problem

- why are you looking for change

#### HR Round

- how comfortable are you relocating

- basic questions/HR questions

GeeksFoeGeeks is very good website to prepare for the interviews.

It helped me a lot during preparation.

Hope this will help you as well.

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### Fiberlink (maas360) Interview | Set 3

I applied at Fiberlink thorough a referral.

**Round 1 (Coding test):** 1 question to solve at HackerRank with a time limit of 1 hour.

Q. Find all distinct palindromic sub-strings of a given string.

[GeeksforGeeks link](#)

**Round 2: (Telephonic Interview)**

- Basic data structures
- OOPS concepts, private constructors, virtual functions
- Given a stack, a version of a stack is the set current elements in the

Stack Values (top value first)	Operation	Version No.	Output of GetVersion(int)
Empty	-	0	
5	Push(5)	1	5
10,5	Push(10)	2	10,5
11,10,5	Push(11)	3	11,10,5
10,5	Pop	4	10,5
17,10,5	Push(17)	5	17,10,5

You have to implement a function GetVersion(int), which prints out the whole stack for a particular version.

Need to optimize it to best possible solution.

- How to find intersection point of two linked lists in single traversals for both lists.

**Round 3: (Telephonic Interview)**

- Discussions on projects I have worked on in my current organization. They dig in really deep on to find out the level of work and understanding on the projects worked.

**Round 4: (Skype Interview)**

- Discussions on projects.
- Questions on inheritance and polymorphism, other OOPS related questions
- Allocating memory using calloc, malloc and realloc in C
- How are virtual functions implemented internally in C++ ?
- Given a stack, implement GetMax() which returns the maximum element in the stack
- Sort an array containing 0, 1 and 2 (Dutch National Flag problem)
- Find the element occurring more than n/2 times in an array

**Round 5: (Skype Interview)**

- Behavioral questions like Why do you want to change your job with less than 1 year of experience
- Discussions on projects.
- Given a string, find the longest substring having same characters.

E.g- **Input:** abgetsdfffasw  
**Output:** ffi

- Given a building with infinite number of floors. The number of rooms on each floor are 20,21,20,21.. and so on starting from the ground floor. The room number starts from 1 and keeps on increasing. Given a room number, find the floor on which room lies and the position of room from the left. Write a code for it.

- Other logical puzzles

After clearing the above rounds, they called me up to Fiberlink Office, Bangalore for some F2F rounds.

**F2F Round 1 with manager:**

- Project Discussions
- Architectural Discussions on projects and improvements/ drawbacks
- Core Java Questions
- Discussions on how are packages created in Java
- Questions on OOPS and design patterns
- Some SQL queries on inner and self joins with aggregation operators
- Questions on Areas of Interest, mine being networks asked about different networking concepts

**F2F Round 2 with Tech Lead:**

- Project Discussions
- Basic SQL queries
- Discussions on semaphores and monitors(to solve deadlock related problems)
- Logical Puzzles
- Count all possible paths from top left to bottom right of an MxN matrix [GeeksforGeeks link](#)
- Other average data structure codes

**F2F Round 3 with Senior Tech Lead:**

- Project Discussions
- Design a distributed system for a Content Delivery Network(CDN). Thorough discussions for this one
- Open ended puzzles to test the approach to solve a problem
- Mirror image of a tree [GeeksforGeeks link](#)
- Flattening a linked list [GeeksforGeeks link](#)

- Other discussions regarding the interests and domain I would like to work on.

**F2F Round 4 HR:**

1. Why you want to leave your current job/organization?
2. Current CTC, expected CTC.
3. How soon you can join?
4. What do you expect from this job.

After the HR interview, the HR told me that it has been very positive for me and that she has to do a formal discussion with all the interviewers for a final nod, and you can expect the offer structure by tomorrow (got the final offer letter after a week).

Overall, the experience was really nice. The interviewers were amazingly curious and helpful. They are open to other approaches and answers rather than the one they know. A lot of questions were on projects you have worked upon.

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Some words for the GeeksforGeeks team:

Thanks to you guys for compiling up all the super awesome stuff out there at GeeksforGeeks.org. Even the app has been quite amazing. The recent update of the website to responsive design is splendid.

Keep up the good work.

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