# Adobe interview Questions:

### By Amerineni Rohith

(1). Tell me about your summer internship and what was the major challenge you faced over there.
(2). Which type of intern do u prefer. Application or reasearch.
(3). Are you familiar with dynamic programming. Give some arbitrary algorithm u know related to this topic.
(4). Why did you choose only dynamic algorithm for this.
(5). What is the main purpose of using dynamic algorithms.
(6). Can you use greedy algorithm for the problem you suggested.
(7). Which is better Greedy or Dynamic and how.
(8). Prove the greedy algorithm you suggested is correct.
(9). Give the recurrsion formula for the algo.
(10). Give me an example where greedy algorithm doesnt work. (11). When to use dynamic and when to use greedy algorithm.

### By Sejal Sharma:

(1) Describe any two projects you liked the most.
(2) Puzzle 1: There are 25 horses and a race course that can accommodate 5 horses a time. How many races are required to find the 1st, 2nd and 3rd positions.
(3) Puzzle 2: 10 bikers, each bike having 10 lt fuel tank and the mileage of the bike being 1 km/lt. The bikers can exchange fuel and they need to pass a message the farthest they can. The message will be considered as delivered even if 1 biker reaches the point. What is that maximum distance?
(4) Consider a tree that has at most 5 children. Write the code to find its height

### By Anuj Gupta :

Q0. Do you like it there in Guwahati?
Q1. A king owns thousand bottles of wines. One of them is poisoned. The poison acts only after one month. He has 20 prisoners at his disposal. Suggest a solution to find the poisoned bottle in one month killing as little prisoners as possible.
Q2. 10 bikers, …
Q3. Write a function to find the height of a binary tree.
Q4. Find a regular expression for all valid combination of open and closed brackets (every opening bracket has a corresponding closed bracket ). Alphabet sigma ={ ‘(’ , ‘)’ } .
Q5. Explain as to why the following situation is being faced:
The CPU usage is nearly zero but the memory usage is full and the page faults are going on increasing.

### By Pradeep Bansal:

Asked me lot about our project in system programming lab on mail retrieval
then he asked me one question and to code it
Given two sorted array A and B having m and n elements respectively, size of A is m and size of B is

m+n.give a algorithm to get a merged sorted array of A and Bwithout using anything other tahn A and B

# Facebook Online Test Questions :

**Q1.**

Input:

3

3 1 2

nny

nnn

ynn

output:

2 1 3

n size of permutation P.First line of input is n.Second line is the permutation P.A Permutation X is said to be lexicographically smaller than Y if for all digits till i X[i]=Y[i] and for i+1 X[i]<=Y[i]so you can exchange the integers in the given permutation P if character j of line i+2 is 'y' then i th and j th integer in P can be exchanged .

Output:Lexicographically smallest premutation of the given P using rule

Question was from Career Cup: http://www.careercup.com/question?id=14412669

# Facebook Interview Questions

## First round:

## By Neha Goyal:

Why do you want to join facebook? what exactly do you want to work on? Given a regular expression invloving symbols a-z, *, . where . can be any symbol. Given a string find whether it belongs to the language of the regular expression.

## By Abhishek Joshi:

1. Write a function to determine that whether there are three different elements in an array of integers that sums up to 0. Input is the the array (and possibly the size of array if you need it). Return boolean.
2. Write a function that given an integer k and a root of a binary search tree, element of tree is of integer type, find the k-th smallest element in the tree. (please start with the struct of binary search tree in your preferred language).

### By Achal Shah:

**Round 1:**

1. Given a sorted array of integers and a number k, write a function to find the last occurrence of the number.2. Implement Pop, Push and Max functions for an integer stack, where the max function returns the maximum element of the stack (pop and push perform the usual operations). (All the functions were required to be implemented in O(1) time complexity).Time limit: Approx 45 mins total.

**Round 2:**

1. You are given a board (assume of size 4x4), where each cell has a character. Given a word, find if the word can be formed on the board. For instance, if the first letter is found on the board, then the next character can be on any of the 8 adjacent cells. And so on.Time limit: Approx 30 mins.

## MS-IDC Coding Test Questions :

Q1. Given two strings s1,s2. Find whether s1 is a perfect permutation of s2 or not ?
sample input: s1= arpit , s2= tipra
output: true

Q2. Given a linked list containing digits between 1 to 9, find whether its a palindrome or not?

Q3. Given sorted doubly linked list of integers . Convert it into a BST which is fairly balanced i.e. it should not be skewed.

## MS-IDC interview Questions :

**Round 1:**

We all were given some papers and 2 questions were dictated.
1.Give the common node of two singly-linked list if any.

2.Find left and right neighbour of a node in a binary tree.You have pointers to left and right child as well as that of parent for every node.(Left and right neighbour are those node which are L & R on same level in level order traversal)
Each was assigned 1 mentor(For a group of 4-5 students) and we were supposed to discuss approach with them and then write the code.

**Round 2:**

**Harsh Gupta:**

1.Given an arbit length single-linked list , delete first n and last n for every 3n elements.
2.Given infinite 1,2,5,10,15,20,25,50 paise coin give all combination to make 100 paise.

**Anil Kag:**

1.Given a singly linked list of nodes having an attribute 'color' within them (takes only green, red & blue values). Sort the list.
2.Given an N x N matrix, print it's contents in spiral fashion. i.e. outer circle first, then inner one & so on.. (outer circle means (0,0) -> (0,n-1) -> (n-1,n-1) -> (0,n-1) -> (0,0) & without repeating any entry)

**Praful Johari:**

1. Given two sorted lists, one of size n and one of size 2n, where the list of 2n size has 1st n positions filled. Merge the two lists.
2. Given a head node for a graph, and the structure of node containing only an int value and a list of pointers, clone the graph optimally.
3. Find the second largest element in a BST.

**Round 3:**

**Harsh Gupta:**

Little bit informal, the guy was asking experience with the selection process and about the last interview.Then he asked to implement priority heap and level order of a binary tree in a 'S' fasion i.e.
1
2 3
4 5 6 7
should output 1 2 3 7 6 5 4
Then he asked about the subject I like and why , my + and - points, my target etc.

**Praful Johari:**

**Tips:**

The interviewer is your employer. If he asks to implement something for him, atleast try to do the same. And if you cannot even 'attempt' it, tell him instantly! :P
Also, never say STL in front of interviewers, even if you know that it is the best implementation anyone can give, and that you are going to use it anyway in your future codes .. :D

**By Abhishank Sahu**

Q1. Do you like here in Guwahati.
Q2. What are your favourite subjects and why?
Q3. Write a function to count the number of words in a given string. I was supposed to write a program that will ignore all the whitespaces. Then they threw some question over my function.
Q4. The columns in a Excel sheet are numbered as A, B.....Z,AA,AB....AZ,BA,BB..... Now each of this columns have been mapped with an integer starting from 1,2,3....(for e.g. A-1 Z-26, AA-27,AB-28). Now I have to write a program which takes a number as input and print the column name mapped with it. Again they threw many question on the implementation like how would i know the size of sring with which the number will be mapped, was asked to write both iterative and recursive version of the function.
Q5. What is priority queue. How can it be implemented?
Q6. Write a program to implement a heap fully i.e. All the operation like insert,delete max, delete any node, changing priority of any node etc. The implemention should not use array.
Q7. He also asked all the question asked in first round of interview.

## Abhishek Joshi

**Interview Round 1:**
Q1.How is IIT Guwahati?
Q2.Given a chessboard and a Knight,the knight can be placed in any position(starts at (x,y)),write an algortihm to print a path such that with the knight, you cover all the remaining 63 cells in 63 moves.

**Interview Round 2:**
Q1.Print the nodes of a binary tree in a S fashion.
ex:-
1
/ \
2 3
/ \ / \
4 5 6 7
ans should be
1 2 3 7 6 5 4
Then he asked me about how was the last interview and what are my strengths and then I asked him some questions about Microsoft

# Directi Coding Test Questions:

Q1. You are given a square matrix of integers. The cost of travelling from a cell A to cell B is the sum of numbers in all the cells which lie on the path between A and B, inclusive.
You need to travel from the top left cell to the bottom right cell, and back, minimizing the total cost of travel, subject to the following conditions:

1) You cannot use squares on the leading diagonal of the matrix (Apart from the top left and the bottom right cells).
2) When travelling to the bottom right corner, you may only move rightwards or downwards. Similarly, while travelling back to the top left corner, you may move only leftwards or upwards.
3) Your first move while going from top left to bottom right should be rightwards. Similarly, your first move while going from bottom right to top left should be leftwards.

## Input

The first line of input consists of a single integer T, the number of test cases. T Test cases follow. Each test case contains a single integer N, the number of rows in the matrix, followed by N lines, each containing N integers.

## Output

For each test case, output on a single line the minimum cost of travelling from the top left corner to the bottom right corner, and back, subject to the constraints mentioned in the problem statement.

## Constraints

1<=T<=50
2<=N<=100
Each member of the matrix, as well as the solution, will fit in a 32 bit unsigned integer.

## Sample Input

```
2
3
4 10 6
1 1 5
-5 6 8
4
5 11 4 6
```

3 2 10 3
1 3 1 3
4 2 8 8

## Sample Output

39
62

## Explanation

In the first test case, there is exactly one path available. The solution is 4 + 10 + 6 + 5 + 8 + 6 -5 + 1 + 4=39.
In the second case, we get 5->11->4->6->3->3->8->8->2->3->1->3->5, leading to a total of 62.

Note that you cannot use the cells of the leading diagonal in your path, apart from the top left and the bottom right cells.

Q2.
A N x N grid is filled with lower case characters from 'a' to 'z'. A square matrix is called a palindrome if the string formed by concatenating characters from the main diagonal is a palindrome. Count the number of sub-squares in the N x N grid, including itself, that are palindrome.

## Input/Output

You don't have to read or write anything from/to stdin and stdout respectively. Use the template code provided in the editor on the submission page, that does the IO for you.

In the template, You have to write a function that takes an integer N and a 2 dimensional array(representing the grid) of characters (array of strings for Java) as arguments and returns the number of sub-squares that are palindrome.

Function Signature:
int square_palindromes(int N, char A[][101]);

The template code executes the function submitted T times with different arguments.

## Constraints

0 < T <= 100
0 < N <= 100

### Example

A = [['a', 'a'],
['a', 'a']];
square_palindromes(2, A) should return 5.

A = [['q', 'd', 'd'],
['e', 'a', 'f'],
['q', 'd', 'q']]
square_palindromes(3, A) should return 10.

### Input file for example:

2
2
aa
aa
3
qdd
eaf
qdq

### Output

5
10

# Directi First interview round:

#### Pradeep Bansal

Q.. Tell me about yourself?
Q.. Tell me about your academic background
Q What are virtual function?
Q.. What are virtual function ? (a little details about it ?)
Q.. some thing relating virtual function and java
Q1. Given infinite nuber of r length ropes, you have to give a formula for minimum no of cuts required to make n c length ropes.Answer n-([nc/r] *r)/lcm(c,r)
[] means greatest integer less than or equal to...

Q2 Given n*n 2d array having entres l and w, output the largest rectangular subgrade area containg only w ?Q3 Given n landmark, m*m 2 d matrix having entry 0 or 1, 1 correspond to a

landmark, you can visit a landmark if you have either x cordinate same or y, you start visiting from coordinate (0,0) minimise distance to travel all coordinate ?

**Amogh Tolay:**

1. Given an infinite number of ropes each of length r, you have to cut the ropes into n ropes of length c, so that minimum number of cuts are required. Give a closed form solution for the same.
Now, if instead of minimising number of cuts, if I want to minimise number of ropes used, give the solution
2. A 2-d matrix contains entries l and w, find the maximum area of a sub-array containing only l's or only w's.
3. There is a 1D array that contains colors of socks. We have to choose pairs of socks from this array, such that when a pair of socks is chosen, no other sock between the two socks can be used. For eg. if you use sock i and sock j to form a pair, then you cannot use any sock between i and j. Now find the maximum number of pairs that you can find?
4. What is a virtual function?
5. What is static polymorphism?

# Amazon 2nd Round Written Test:

Q1. There exists a number (which is unbounded, i.e. has no upper limit), that you cannot access. You are given a function, that accepts a number as parameter, and returns if the parameter number is greater than the unknown number, or not. Write a code to find the unknown number.
Q2. Given 2 nodes, find the shortest (least weight) path between them. Algo only, not asked to code.----

**Aditya Kanetkar**

Q. You are given a binary tree. Find the length of the maximum walk in the binary tree with atmost one bend. Anytime during the walk if you happen to move from a left child to a right child, it is considered as a bend. Try doing this without using a parent pointer, but the supervisor finally allowed the use of a parent pointer.

**Priyatham Bollimpalli:**

1)You are given a set( of characters) as an array.Print the power set of the given set.

**Amogh Tolay:**

Given a Binary tree (not a BST), find the maximum sized BST which is embedded within it. Maximum size is defined as max num of nodes in that BST.
Do it in O(n) was implicit.

by nipun edara
1) Given a binary tree, find the largest(number of nodes) binary search tree in it? (space and time complexity efficiently)

# Amazon 3nd Round (Interview):

**Aditya Kanetkar**

Q. Convert any binary tree into a sumtree as mentioned above. You are allowed to change the value of any node in the binary tree.(Just the algorithm)

**Neha Goyal:**

Zig Zag BFSGiven a Binary tree print the nodes in zing zag bfs order.
for ex:
1
2 3
4 5 6 7
the output should be
1 2 3 7 6 5 4

Given an infinitely large chess board, a pawn and a knight. Find out whether the knight can kill the pawn or not. If it can then find the path which it has to follow to kill the pawn.

**Deepak talasila**

Q1. What are the projects you are currently involved?
Q2.Print a tree level order wise.
Q3. Given a matrix with dimensions m rows, n columns print the matrix numbers in clockwise directions.
Q4. A sumtree is defined as tree in which every node has value equal to sum of values of its children. write an algorithm to detect if a given tree is sumtree or not.
Q5. You are given a list of trains with arriving and departure timings, write a function to tell the number of platforms to accommodate those trains without time collisions.

# Qualcom Interview Questions:

**Priyatham Bollimpalli:**

**Technical Round:**

1)Tell me about your summer project?What challenges you faced?What technologies you used and why you used etc..
2)Tell me any one of your academic projects you have done...
Basically he is trying to know if you have got full command over the projects...
3)What is virtual function?Virtual Destructor?Where and Why are they used?
4)What is polymorphism?What are it's different types?Give some examples...

**HR Round:**

1)Tell me about your family background
2)What tools and technologies do you know?
3)How is Qualcomm benefitted by giving you intership?
4)What do you know about Qualcomm?

**Dileep:**

1)In a movie theatre, at the counter of issuing tickets, girls and boys are in random order. Give an efficient algo to rearrange the queue such that all the girls are at the beginning of the queue and boys at back
2) What is "Width of CPU"?
3) Give an overview of the 4-bit CPU which u made.
4) Difference between Macro and Function (from compiling point of view)
5) What is Linker, Loader, Assembler

**HR Round:**

1) Tell me about your self
2) Why you but not others for this internship position
3) What is your research interest and if the summer project given is not related to your research interest will u work (u need to convince them that we can take up any project)
4) Why Qualcomm and what do u know about it?
5) How is Qualcomm benefited?

**by shivangi**

1. questions about keywords such as static, extern , virtual , const and basic C++ principles. 2. c code : how to divide a number by powers of 2 without using a division operator?3. c code to calculate power of a number in lg n time4. questions based on COA like- cache , types of cache and gave real world cases as to where which type of cache should be used , instruction pipelining based questions

# NetApp interview Questions:

**Deepak**

1) FCFS algorithm can be parametrized as round robin with time slice =infinity. Then parametrize the priority queue in terms of FCFS.
2)What are the technologies you have learned?
3)Scheduling algorithms in OS.

# Google Interview Questions:

**Sai Kalyan:**

1) Given a node in a graph, write the code to find all other nodes both recursively and non-recursively
2) Given a number in an array, write the code to increment the number.
3.)Given a large set of words in an array in lexcicographical order, and given a prefix, find the first word starting with the prefix.

**Charu Jain:**

1->Given a stream of data for the brightness of 10^12 stars in the sky, find the 1000 brightest stars.
2->Write the classes, method declarations and data members needed to evaluate a move request in a game of chess between two humans.
3->Design a collection class that looks like this:

```
class set {
public: int a[];          //m=no of integers in array
int GetMedian(int a);
```

void Insert(int n);}
4->[1,2], [2,2,7] 12 + 227 = 239  [2,3,9]
add( array a, array b)

**By Talasila Deepak:**

1) given some discrete probabilities design a data structure to store then so that when we retrieve them randomly the elements are reported proportional to their probability.
2) given a bst in which every node has parent pointer given an element return the element which comes after it in inorder traversal.
3)Given an array containing some integers give the largest consecutive set of integers.

**By Arpit Agarwal:**

**Round1 Interview1:**

Q. You are given an array of integers (for eg.: 58943721). Find any one of the local minima in O(log n) time.
o/p: 5 or 3 or 1
Interview2:
Q. Give algorithms for Serialization of a List of strings. Also Give algorithm for de-serialization and code it.

**By Kiranmayi**

Do you want to know anything about google?
Read input from any file. You have a function which reads line by line.(function given to read line by line.) (Hash function already implemented)
Eliminate all those lines which are redundant.
Extend it to words arranged in any order (eg: if two lines contains same words then consider both these line to be same.).
Space complexity of your algorithm. What would you do if the file is very large.
Given a string of 0s, 1s, and 2s (wildcards), generate all 0-1 strings that match this pattern, e.g. 12002101 -> [10000101, 10001101, 11000101, 11001101]. You can generate the strings in any order that suits you.

**by nipun edara**

**Interview 1:**

1) tell me about your summer rnd project?
2) Given a node in a BST, find the next node with greater value than the given node(i.e, next node in in-order traversal)
3) Given an array of numbers, find the longest consecutive sequence in the given array of

numbers (for e.g. 3,7,11,5,10,2,9 is the given array, then answer is 9,10,11) Try to do it in O(n) time complexity

**Interview 2:**

1) tell me about your summer rnd project?
2) given an array of digits, return the digits by incrementing the one's place by one (i.e, if given array is 1,7,3 you need to return 1,7,4)

# D.E.Shaw interview Questions:

**Sai Kalyan**
**Round 1:**
1.)Define finite automata
2.)How do you detect a loop in a linked list
3.)What data structures are required and how to implement levelorder, inorder and postorder traversal
4.)Which ds is required to evaluate postfix expressions and how?
5.)Iteration or recursion, which programming procedure is better?
6.)How to find if a binary tree is a BST?
7.)What is post fix expression?. How to evaluate post fix expression.
**Round2:**
1.)What is polymorphism and types of polymorphisms?
2.) What is virtual memory?
3.)What is static and dynamic  linking?
4.)Extern variables
5.)What are the data structures that you have used? What is the diff b/w vector and array and lists
6.)Diff b/w #include<> and #include""
7.) What are virtual functions? How are they implemented?

**Charu Jain:**

1->What is Abstraction? Run time and compile time polymorphism.? write code snippet to tell the same.
2->How will you find out how many instances of same object have been allocated memory?
3->Given a head pointer, how will u delete a node in Linked lists without using any xtra pointer or variable.?(no memory leak i.e u cant swap values or de-link)
4->Find the nth node from last in linked list..?

5->How will you find if the graph is connected.?
6->Code for quick sort followed by finding the kth smallest element in an array.?
7->Was based on degree of connection on fb. Find out the least degree node.?(they defined degree)
8->Puzzle: Given 10 machines one is defective.( Analogy with the pepsi machine producing pepsi, suppose 9 machines produces full cup and 1 produces half) find the defective machine in 1 test.?

**Deepak:**

1)given an array containing ages of people give an good sorting algorithm.
2) given an sorted rotated array how to search in it?
3)how to store a binary tree?
4)questions about inheritance and overloading.

**Arpit Agarwal:**

Q1. Given a sorted array, find its median.
Do it in case of 2-D array, where each row and column is sorted.
Q2. Find the Kth largest element in linked list.
Q3. Given only a current pointer to a node, no other pointers(head/tail), can u delete it?How?

**Kiranmayi:**
1. What is abstraction?
2. What is polymorphism? How many types and how it is achieved?
3. Whta are static methods?
4.Virtual Functions.
5.Given a head pointer, how will u delete a node in Linked lists without using any xtra pointer or variable.?(no memory leak i.e u cant swap values or de-link)
6.Find the nth node from last in linked list..?
7.How will you find if the graph is connected.?
8.Code for quick sort followed by finding the kth smallest element in an array.?
9.Puzzle: Given 10 machines one is defective.( Analogy with the pepsi machine producing pepsi, suppose 9 machines produces full cup and 1 produces half) find the defective machine in 1 test.?

**by sharath reddy**

1.tell about polymorphism virtual pointers, virtual table, virtual functions
2. What is operator overloading? what is function overloading? whether two functions having same name, arguments but with diff return value can be overloaded?

3. What is dead lock? how to prevent that?
4. Discuss various job scheduling algos. Disadvantages of FIFO.
5. What is post fix expression. How to get a posti fix from infix. How to evaluate post fix expression.
6. Disadvantages of Radix sort
7. Discuss BST. and various types of traversals of binary tress. How about right child -> root -> left child traversal?

**By Pradep bansal:**

**Round 1**

1. Tell me abot yourself. Then he asked question about my dictionary project.
2. If you have a large file (more than main memory) (its a dictionary file) so you have to implement a dictionary in it with feature of insertion.
3. Given a number give its next large permutation that is if you have a number 1234 then next is 1243.
4. have you studied networks.
5. What about Computer organization and architecture.
5. What is pipeline, virtual memory its uses, thrashing (is it only for multi user environment). any questions for us ???

**Round 2:**

1.Tell me about your mail box project.
2. If you have to create this application for your university, then what data structure you will use to store contacts (searching and all become easy).
3. Iterative inorder traversal.
4.Which all data structure you know.
5. Tell me about heaps, is heap a bst, is it complete tree, what is a complete tree.
6. Dynammic and static polymorphism.
7. Difference between delete and free.