Technical interview question asked
Microsoft: lca of 2 nodes in BST (log N expected) , multi source bfs, minimum coin change dp variant, Fibonacci like dp (log N expected) Morgan Stanley: binary search, matrix chain multiplication dp variant, design stock exchange using oops, virtual pointers, pure virtual functions, paging, segmentation, LRU cache implementation
1. Given number of bricks, identify the maximum number of stairs that can be build (binary search) 2.Make a DB, class and system design for an app that manages the sports arena of VIT, it should handle bookings of court 3. Leetcode question Sliding window maximum 4. General DBMS, OS question 5. What happens when you type a url in your browser 6. Topological sort question, given a list of pairs (a,b) such the a is heavier than b, return a list of all the people in descending order of their weight 5. All one data structure (Leetcode question)
1) given an array convert into balanced binary search tree 2) given a string, count the frequency of each letter 3) how would you implement hashmap by yourself 4) tell me about hashing and some hashing techniques 5) Spotify database design and some SQL queries 6) technical questions on projects 7) given a matrix of 0's and 1's , 1 represent presence of island and 0 represent water. Find the biggest island and number of island. 8) instagram backend design and how API calls to the backend work.
Find the highest peak in an array-(the longest subarray which first strictly increases and then strictly decreases)? What are private constructors- state its uses?
Rotating an array by 90Â°
You have an array with n elements. There are n/2 even and n/2 odd elements. You have to rearrange the array in such a way that the even numbers are at even positions and odd numbers are at odd positions with the least number of swaps. Try to do with minimum possible time complexity. Talk about projects you have developed and the underlying principles in it.
1)dijkstra algorithm 2)largest substring with no repeating characters 3)Design uber type application using oops 4)Lowest common ancestor 5)Kosaraju Algorithm 6)Design dream11 type application using oops 7)Asked about projects that i mentioned in the resume in detail.
Largest Palindromic Substring, LRU Cache, System Design, Synchronisation

1) Reverse a sentence (with different edge cases like full stop, capital letters, comma)
2) Merge sorted arrays
3) Height of binary tree
4) Finding intersection point of 2 arithmetic progressions (Framed in a story)
Useful Link -https://math.stackexchange.com/questions/3051893/find-of-two-arithmetic-progressions-meet
5) What will happen when 2 people try to edit a information same information in database.
Question is similar to - What will happen if multiple users will try to book the same ticket using different platforms? How to solve this problem?
6) Puzzle - If water in a lake doubles every year and lake becomes full on 28th day. At what day will the water in the lake will be half of its capacity. answer - 27th day.
7) High level design of a dream 11 like app.
8) What database you will use for this app - SQL or NOSQL type.
9) When and why do you use relational or non relational databases.

DBMS
1. What is indexing and why do we use it?
2. Why can't we create an index table for every column in a table?
3. Query problems
  3.1 How to find the 2nd largest salary
  3.2 Natural join

CN
1. What happens when you type google.com in your browser. (Expectation is we must know the standard proctocols, DNS, etc.)

OS
1. What are threads? How are they different from processes?
2. How do threads communicate between themselves, what are the problems faced in shared memory model and what can we do to solve them.
3. What is deadlock, how can we avoid/resolve it.

DSA
1. https://leetcode.com/problems/reverse-nodes-in-k-group/
2. https://codeforces.com/problemset/problem/767/D
3. https://www.hackerearth.com/practice/algorithms/greedy/basics-of-greedy-algorithms/practice-problems/algorithm/minimize-nodes-15f14b04/
4. Clone a tree (similar to https://leetcode.com/problems/clone-graph/)
5. https://leetcode.com/problems/minimum-path-sum/

1. Implement Stack from scratch (Using Linked list)
2. Explain Threads vs Process
3. Write a program to print Fibonacci Sequence with optimised time and space complexity
4. Write a program and explain various types of inheritance
5. Given a array of numbers and a target. Find if there exists two numbers from array which add upto target in linear time complexity.

1) next greater element for all elements in array.
2) next greatest element for all elements in array.
3) implement queue using 2 stacks.
4) implement low level system design for chess.

- String question: given a string "aav?a?s", replace the question mark in the string with a character such that it is not the same as its immediate left and right term - Why are interfaces used? - Consider a scenario when a loan providing company provides
1) Meeting Room Problem: given starting time and end time of each meeting... we need to find the minimum number of rooms required to accomodate these meetings given that no 2 meetings with overlapping intervals can be accomodated in one room 2) Candy Problem: https://leetcode.com/problems/candy/ same problem with different build up 3) Reverse Level Order Traversal of Tree: We need to print a tree from leaf to root node, i.e. we first need to print all the leaf nodes, then essentially mark them as removed and print the next step of leaf nodes until the tree becomes null. 4) Design document searching: We are given various documents along with their text, we need to design a search mechanism which optimally searches for the different documents that contains a given word... 5) Implementation of stack and fibonacci using reursion and various discussion on Time Complexity along with memoization approaches on the same problem...
1. Convert a BST to complete BST 2. Word Ladder (leetcode)
Leetcode coding questions system design (how to built an app) sql query (simple) built hash map
1) Given a string containing small letters and question marks, replace the question marks with a letter different from its adjacent letters. List all the edge cases, testing cases and potential threats to the input, output and processing of this code. 2) Least common ancestor of binary tree, binary search tree in O(1) space 3) Word ladder, why bfs approach is better than dfs in this case, create tabulation matrix 4) Difference between dfs and bfs using real life example as well as a coding scenario example with whihc approach is better in what kind of situation and why 5) Max area of an island (different variations dynamically)
1) find LCA of two nodes in a binary tree 2) OOPS concepts 3) dbms 4) BFS and DFS real world examples and advantages. 5) which application do you use the most?
1. Maximum Subarray Sum (Kadane's Algorithm) 2. Maximum length substring without repeating characters. 3. What will you check/ensure before accepting a pull request in github? 4. Questions on SQL Join query

Hr interview questions asked
Microsoft: project based | Morgan Stanley (Scenario based): Will you take a risky approach(better performance) or safer approach, how will you get people to collaborate on risky approach, if unseen problem occurs, how will you handle.
1. Tell me an instance where you think you should've listed to your team mates. (Then a lot of questions followed depending on my answer) 2. Why Airbnb? 3 which Airbnb value do you most associate yourself with? 4. What was the time when you inspired someone 5. Apart from technical, what more things do you do? 6. How do you help someone achieve their goal? 7. In-depth questions based on you project. It's system design, if you chose something why did you choose it for your project.
1)tell me about yourself 2)What will you do if some of your teammates are not working and the project deadline is near?
How will you convince a fellow peer in your group to contribute more in a project?
Why join Microsoft?
Actually I got my offer through Microsoft's Engage Mentorship program and hence, there was no HR Round there. There was only an AA round which was completely technical.
What are your greatest strengths and weaknesses? , Tell me about a time where you experienced difficulty at work while working on a project? , What do you think is an work-life balance? How does diversity hiring helps the company? , What do you know about the company?
Tell me something about yourself which is not in your resume

1) Why Microsoft? 2) Tell me something outside of your resume 3) Discussion on a failed project and why it failed ? 4) What will you do if you feel your colleague adding less value but still getting more rewards that you? 5) What do you think growth is? 6) What is MVP and explain if you have used this concept somewhere. 7) Development v/s Maintenance what would you choose and why? 8) What are your views on diversity, what is diversity? 9) Why all your teammates in a project were not diverse and have you ever worked with people from diverse background and are you comfortable with it?
1. What would you do in a conflict? 2. Where do you see yourself in 5 years 3. Suppose you see a senior bullying someone else, what would you do in such a situation?
1. Detailed explanation of projects mentioned in Resume. 2. Where do I see myself 5 years from now. 3. What are my aspirations
1) If you were given infinite resources and all the money you could image, what would you do? 2) Tell a scenario from your life where you solved a problem despite of several challenges?

#NAME?
1) Your aspirations, 2) Things that bother you, 3) How do you rate your friends, 4) How do you think your college and professors are, 5) Do you plan on doing masters and if given a chance would you work with research team?
1. What are your aspirations and who is your role model.
1) Projects which failed 2) How did you overcome from that situation 3) one wrong decision that impacted the team and learnings from them 4) multiple scenarios of problems occuring in the company and how would you solve them
Why Microsoft?
1. Why Microsoft? 2. Mention one of your failures and how you overcame them. 3. Why should we hire you? 4. Mention a scenario where you showed teamwork