

Google - Backend Developer

Interview Process

- Telephonic Interview
- Onsite interviews: four to six interviews
- Technical Coding Round and General Analysis Questions
- System Design Round

Interview Questions

1. Subarray with given sum
2. Maximum Index
3. Find median in a stream
4. Finding the numbers
5. Word Boggle
6. Connect Nodes at Same Level
7. LRU Cache
8. Count BST nodes that lie in a given range
9. Find triplets with zero sum
10. Ways of transforming one string to other by removing 0 or more characters
11. Alphanumeric Abbreviations of a String
12. Longest Possible Chunked Palindrome
13. Paper Cut into Minimum Number of Squares | Set 2
14. Find median of BST in $O(n)$ time and $O(1)$ space
15. Sum of bit differences among all pairs
16. Minimum number of swaps required for arranging pairs adjacent to each other
17. Find the longest substring with k unique characters in a given string
18. How would you design Google's database for web indexing
19. How would you design Google Docs?
20. How would you design Google Search?
21. How would you design Google Home (voice assistant)
22. How would you design Amazon's books preview
23. How would you design a social network
24. How would you design a task scheduling system
25. How would you design a ticketing platform
26. How would you design a system that counts the number of clicks on YouTube videos
27. How would you design a webpage that can show the status of 10M+ users including: name, photo, badge and points
28. How would you design a function that schedules jobs on a rack of machines knowing that each job requires a certain amount of CPU & RAM, and each machine has different

amounts of CPU & RAM? Multiple jobs can be scheduled on the same machine as long as it can support it

29. Given a binary tree, find the maximum path sum. The path may start and end at any node in the tree."
30. "Given an encoded string, return its decoded string."
31. "We can rotate digits by 180 degrees to form new digits. When 0, 1, 6, 8, 9 are rotated 180 degrees, they become 0, 1, 9, 8, 6 respectively. When 2, 3, 4, 5, and 7 are rotated 180 degrees, they become invalid. A confusing number is a number that when rotated 180 degrees becomes a different number with each digit valid. (Note that the rotated number can be greater than the original number.) Given a positive integer N, return the number of confusing numbers between 1 and N inclusive."
32. "Given two words (beginWord and endWord), and a dictionary's word list, find the length of shortest transformation sequence from beginWord to endWord, such that: 1) Only one letter can be changed at a time and, 2) Each transformed word must exist in the word list." (Solution)
33. "Given a matrix of N rows and M columns. From $m[i][j]$, we can move to $m[i+1][j]$, if $m[i+1][j] > m[i][j]$, or can move to $m[i][j+1]$ if $m[i][j+1] > m[i][j]$. The task is print longest path length if we start from (0, 0)." (Solution)
34. "Given a robot cleaner in a room modeled as a grid. Each cell in the grid can be empty or blocked. The robot cleaner with 4 given APIs can move forward, turn left or turn right. Each turn it made is 90 degrees. When it tries to move into a blocked cell, its bumper sensor detects the obstacle and it stays on the current cell. Design an algorithm to clean the entire room using only the 4 given APIs shown below." (Solution)
35. Implement a SnapshotArray that supports pre-defined interfaces (note: see link for more details).
36. "In a row of dominoes, $A[i]$ and $B[i]$ represent the top and bottom halves of the i-th domino. (A domino is a tile with two numbers from 1 to 6 - one on each half of the tile.) We may rotate the i-th domino, so that $A[i]$ and $B[i]$ swap values. Return the minimum number of rotations so that all the values in A are the same, or all the values in B are the same. If it cannot be done, return -1."
37. "Your friend is typing his name into a keyboard. Sometimes, when typing a character c, the key might get long pressed, and the character will be typed 1 or more times. You examine the typed characters of the keyboard. Return True if it is possible that it was your friends name, with some characters (possibly none) being long pressed." (Solution)
38. "Given a string S and a string T, find the minimum window in S which will contain all the characters in T in complexity $O(n)$."
39. "Given a list of query words, return the number of words that are stretchy." Note: see link for more details.
40. "Given an array of words and a width maxWidth, format the text such that each line has exactly maxWidth characters and is fully (left and right) justified."
41. "Given a matrix and a target, return the number of non-empty submatrices that sum to target."
42. "Given a rows x cols binary matrix filled with 0's and 1's, find the largest rectangle containing only 1's and return its area."

43. "Your car starts at position 0 and speed +1 on an infinite number line. (Your car can go into negative positions.) Your car drives automatically according to a sequence of instructions A (accelerate) and R (reverse)...Now for some target position, say the length of the shortest sequence of instructions to get there."
44. "Given strings S and T, find the minimum (contiguous) substring W of S, so that T is a subsequence of W. If there is no such window in S that covers all characters in T, return the empty string "". If there are multiple such minimum-length windows, return the one with the left-most starting index."
45. "A strobogrammatic number is a number that looks the same when rotated 180 degrees (looked at upside down). Find all strobogrammatic numbers that are of length = n."
46. "Given a binary tree, find the length of the longest path where each node in the path has the same value. This path may or may not pass through the root. The length of path between two nodes is represented by the number of edges between them." (Solution)
47. "Given the root node of a binary search tree, return the sum of values of all nodes with value between L and R (inclusive). The binary search tree is guaranteed to have unique values."
48. "A group of two or more people wants to meet and minimize the total travel distance. You are given a 2D grid of values 0 or 1, where each 1 marks the home of someone in the group. The distance is calculated using Manhattan Distance, where $\text{distance}(p1, p2) = |p2.x - p1.x| + |p2.y - p1.y|$."
49. "You are given two non-empty linked lists representing two non-negative integers. The digits are stored in reverse order and each of their nodes contain a single digit. Add the two numbers and return it as a linked list."