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Applied (OnCampus/OffCampus): OnCampus

Round 01: Online Coding Test

Detailed Round Description:
This round was conducted online via HackerRank and lasted 90 minutes. It consisted of three coding problems (one easy and two medium) that needed to be solved to qualify for the subsequent rounds.

Problem 1: Delete Node In A Linked List

Description:
Given a node in a linked list (with only access to that node), the task is to delete it. Note that this problem is tricky because you cannot simply delete the node without affecting the list structure.

Problem Approach:
The approach involved copying the data of the next node into the current node. However, this method "corrupts" the next node and is not a recommended production solution.

Code Logic Block

Input: A reference to the node in the linked list.

Output: Modified linked list where the given node's value is replaced (effectively "deleted") by copying the next node's data.

Key Steps:

- Initialization: Ensure the given node is not the tail.
- Main Logic: Copy the data from the next node into the current node.
- Return/Final Step: The list remains intact but with the current node "overwritten" by its next node's value.

Optimizations/Additional Notes:
The solution works under the constraint of having access only to the node to be deleted. It's important to note that this method is not a true deletion but a workaround.

Problem 2: 3Sum

Description:
Given an array of integers and a target value, the objective is to find three numbers in the array whose sum is closest to the target.

Problem Approach:

1. Sort the array to enable the two-pointer technique.
2. For each element, set up two pointers (one starting just after the current element and the other at the end of the array).
3. Calculate the current sum and compare it to the target.
4. Adjust the pointers based on whether the current sum is greater or less than the target, keeping track of the minimum difference.

- **Time Complexity:** $O(N^2)$
- **Space Complexity:** O(1)

Code Logic Block

Input: Array of integers and a target value.

Output: A triplet whose sum is closest to the target.

Key Steps:

- **Initialization:** Sort the array and initialize a variable to store the minimum difference.
- **Main Logic:** For each index `i`, set a left pointer at `i+1` and a right pointer at the end of the array. Compute the sum and update the minimum difference if the condition is met.
- **Return/Final Step:** Return the triplet that gives the closest sum.

Optimizations/Additional Notes:
The approach efficiently narrows down the possibilities using sorting and the two-pointer technique.

Round 02: Video Call

Detailed Round Description:
This round was conducted via video call and lasted 60 minutes. The session began at 10 AM with a gentle interviewer, focusing on solving two coding problems.

Problem 1:All Possible Balanced Parentheses

Description:
Given a positive integer `N`, generate all possible sequences of balanced parentheses using `N` pairs. A sequence is balanced if it can be transformed into a valid mathematical expression by inserting characters like '+' and '1'.

Problem Approach:
Use a recursive method with two counters: one for the number of `'('` and one for `')'`. Add a `'('` if the count is less than `N` and add a `')'` only if it will not unbalance the sequence.

Code Logic Block

Input: An integer `N` representing the number of pairs of parentheses.

Output: All sequences of balanced parentheses.

Key Steps:

- **Initialization:** Set counters for left and right parentheses to zero.
- **Main Logic:** Recursively add `'('` if `left < N` and add `')'` if `right < left`.
- **Return/Final Step:** Collect and return all valid sequences.

Optimizations/Additional Notes:
This backtracking approach ensures that only valid sequences are generated.

Problem 2:Minimum Sum in Matri

Description:

Given a 2D matrix `ARR` of size `N x 3` containing integers, find the smallest sum possible by selecting one element from each row with the constraint that you cannot select the element directly below a previously selected element.

Code Logic Block

Input: A 2D matrix `ARR` (size `N x 3`).

Output: The minimum possible sum based on the selection rules.

Key Steps:

Initialization: Set up a mechanism to iterate over the rows while tracking the last selected column.

Main Logic: For each row, choose the element that does not violate the selection rule, ensuring the running sum remains minimal.

Return/Final Step: Return the minimum sum obtained after processing all rows.

Optimizations/Additional Notes:

Further details on optimization were not provided.

Round 03: HR Round

Detailed Round Description:
This HR round lasted 30 minutes and was conducted on 6 Sep 2022 around 10 AM. The interviewer was very humble and gentle. This round focused on basic HR questions aimed at

Problem 1: Basic HR Questions - Tell me about yourself?

- **Description:**
  The interviewer asked for a brief self-introduction that goes beyond what is mentioned in the resume.
- **Problem Approach:**
  - Avoid asking the interviewer what they want to know.
  - Refrain from repeating your resume verbatim.
  - Use adjectives such as problem-solving, innovative, tech-savvy, creative, and quick learner to describe yourself.

Problem 2: Basic HR Questions - Why do you want to work for our company?

- **Description:**
  The candidate was asked to explain the motivation behind applying to the company, with an emphasis on past experiences or handling sensitive information if applicable.
- **Problem Approach:**
  Discuss any past experience handling private information or describe an instance that highlights your ability to work with integrity and respect for privacy.

Problem 3: Basic HR Questions - Why do you want to work for our company?

- **Description:**
  A similar question was asked again, focusing on aligning past projects and career aspirations with the company's requirements.
- **Problem Approach:**
  - Mention past projects that match the role's requirements.
  - Discuss your career aspirations and how they align with the job role.

Problem 4: Basic HR Questions - Why should we hire you?

- **Description:**
  The candidate was asked to articulate what makes them a strong fit for the role.