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**PREPARE
NAVIGATE
SUCCEED**

Technical Interview Tips

Suggestions from IST Peer Career Assistant, Ryan Feng '19 IST: Design and Development

FORMAT

- Your interviewer will start with a behavioral question (Tell me about yourself, what are some projects you've worked on?).
- Then, the interviewer will ask you an easy level coding question.
 - You must write your work out for them.
 - In-person will be on a whiteboard.
 - Over the phone or on skype will be on a "Google doc-type" application where the interviewer watches what you're typing.
- Your interviewer will give you clues and suggestions throughout the process.
- You should create some solution, even if you don't fully write/code it out.
- If you finish soon, you may get more coding questions of increasing difficulty (easy -> hard).

PROCESS FOR EACH CODING QUESTION

- Ask questions, gather background info.
- Think and describe a brute force solution. Don't worry about test cases or optimizations yet.
- Write pseudo code. Don't worry about syntax/spelling.
- Think of test cases where the pseudo code might break (ex. Out of bounds index error).
- Revise pseudo code.
- Start writing the actual code. Ask interviewer if you forget syntax (ex `.toString()` `.charAt()`).
- Walk through test cases and edge cases:
 - What if the number of users is 1 million?
 - What if a string is null or 1 char long?
 - What if a string accidentally has a number or space in it?
 - Watch out for difference in length of string vs index count (String "Maria" has length 5 but index goes from 0-4).
- Improve time and space complexities:
 - Reduce number of for loops, especially if time complexity is $O(n^2)$.
 - Try to reach $O(n \log n)$ time complexity.
 - Store calculations to avoid duplicate work.

Technical Interview Tips

STRATEGIES

- Ask questions right away. Gather background information and any constraints. The interviewer is supposed to give you clues and more info (collaborative).
- Think out loud! Show your thought process.
- Always think about the user and their situation.
- Stay organized and keep your writing neat.
- If you freeze-up or find your mind blanking:
 - Retrace your steps or discuss with your interviewer.
 - Go back to who are the users and what do they want?
- Treat your interviewer like a team-member. You are collaborating to create a solution.
- Your interviewer is not there to criticize you or make you mess up. You are demonstrating how you code in a group setting.
- Watch out for nested 'for loop' and greedy algorithms.

HOW TO PREPARE

- Use resources from companies:
 - <https://news.microsoft.com/life/how-to-ace-a-technical-interview-at-microsoft/>
 - <https://www.facebook.com/careers/life/preparing-for-your-software-engineering-interview-at-facebook/>
 - <https://grouplens.org/blog/preparing-for-a-google-technical-interview/>
 - <https://www.geeksforgeeks.org/top-10-algorithms-in-interview-questions/>
- Study data structures (Linked Lists, Binary Trees, Hash Tables):
 - Know why you should use one data structure over the other (searching, deletion, insertion speed).
 - Know the methods specific to each data structure (in-order, post-order traversal for binary trees).
- Study search algorithms (Breadth 1st search, Depth 1st search, Dijkstra's algorithm).
- Study sorting algorithms (bubble sort, quick sort, heap sort).
- Study Time Complexity/Big-O notation and how to reduce it in your code.
- Study Space Complexity and how to reduce it in your code.
- Buy "Cracking the Coding Interview" and practice problems every week.
- Practice coding challenges on Hackerrank and LeetCode every week.
- Practice whiteboarding and coding questions with friends who also have technical interviews.
- Take every tech interview opportunity you can get, even if you think you are not prepared!
- Keep up with emerging tech news.