TAKE A BIG LEAP WITH

CODING INTERVIEWS

PREPARATION PROGRAM OF RITAMBHARA TECHNOLOGIES

What is common between

- **Interviews** of companies like **Google**, **Amazon**, **Facebook**, **Microsoft**, etc.
- Interviews of product based **startups**.
- Online **coding competitions**.
- Online **hiring events** of high paying product based companies.

All of them have similar questions and similar scope.

Questions are to judge **problem solving abilities** of candidates.

CUSTOM DESIGNED FOR PROFESSIONALS

LEARN FROM THOSE WHO TAKE CODING INTERVIEW

COVERS ENTIRE SCOPE OF CODING INTERVIEW

MOCK INTERVIEWS TO HANDLE SYSTEM DESIGN QUESTIONS

TEACHING THRU REAL QUESTIONS

DAILY EXERCISE

45 DAYS | FOCUSED STUDY

Not just the dream job, but a MORE VALUABLE YOU!

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CURRICULUM

C language & Programming acumen

The first few days focus on acquiring programming acumen taking C as the base language. We do not teach how to write a `for` loop or defining functions. We focus on

- **What happens under the hood:** Life cycle of a program, the memory internals, etc.
- **Intricacies of C language:** C language is little typical
- **Pointers and Memory:** Pointers are rampant in coding data structure and need to be well understood, not just from usage point of view, but also how they look internally.

We also cover other fundamental things like, 'how to compute time and space complexities of an algorithm',

Data Structures

We cover all major data structures starting from Arrays, Strings, Struct, Union, Linked list, Stack, Queue, Binary Trees, Graphs, Hash table, Heap and some of the not so common DS like sparse arrays, skip list, etc. Others data structure like Class are covered in OOPs.

Variations of above data structures are also covered. For example, while discussing Binary Tree, we also discuss, General tree, BST, Multi-way search tree, balanced binary tree and B-Tree.

Multiple implementations for each data structure is covered while studying that data structure. When we study Queue, we discuss both, the array implementation and linked list implementation.

After the tutorial, a good amount of time is spent on the interview questions asked around each data structure. After studying Stack, we also discuss questions like, "Add `getMinimum` function to stack that returns minimum element of stack in constant time".

Algorithms

There are many problem solving tools. We cover every algorithm that is important from Coding interviews point of view[1].

Searching: Linear search & Binary search for all the data structures like Array, Linked list, Binary tree, Graphs.

Sorting: Starting with the basics concepts like Stable-Unstable sorting, Comparison-Non-Comparison sorting, Divide & Conquer, in-place sorting we move to discussing every important sorting algorithm like Bubble, Selection, Insertion, Quick, Heap, Merge, Counting, Bucket and Radix along with their major variation (like Shell sort, library sort, etc.).

Recursion: Recursion is one the most powerful tool to problem solving even when it takes more time and memory compared to non-recursive. Problem like tower-of-hanoi or even tree traversals are very difficult to do without recursion. It is covered in great detail.

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[1] Questions like NP-Complete problems are not important and hence not covered. Similarly specific algorithms of Graph and other data structures that are not important are skipped.

Dynamic Programming: some of the most difficult questions asked in Coding interviews are from DP.

Greedy Approach: It may not be applicable to all situations, but where it works, it give us the best solutions.

Divide & Conquer: Another problem solving approach that is rampant from Binary search to Quick sort.

Back tracking: Identifying & solving problems using back tracking.

String Matching: This is a separate area in itself, because of its usage. We cover major string matching algorithms like KMP, Robin karp, etc.

Java & OOPs

We do not cover Java in as much detail as C language. The focus is mainly on the following areas:

Loading & Memory model of Java: I have seen many experienced java developers unable to answer questions like, how a class is loaded in java by the class loader. The memory model of java is contrasted with that of C language studied earlier.

Collection framework: Java's collection framework is has implementation of almost all the data structures and algorithms discussed earlier. We see the source code and contrast them with our implementations. For example, ArrayList of java is implemented as linked list, we see how our implementation of linked list in C language is different from the way it is implemented in java.

Muti-threading: Java has a strong support for multi-threading. All the concepts of multi-threaded programming is discussed. Atomic section, mutex, semaphore, synchronized block, notify etc.

OOPs Concepts: Class, Object, abstraction, interface & implementation inheritance, data & process hiding, static & run-time polymorphism, Constructors, function overloading, etc.

Puzzles & Logic

Google has changed their policy of asking abstract puzzles. But companies still ask logical puzzles. In this section we focus on different types of puzzles and logical questions asked in coding interviews.

Resume Building

We have a special class on how to make effective resume.

Design

There are two types of design questions asked

1. **Object Oriented design:** It covers questions like, "how will you design a parking lot?", the focus of interviewer is to see how you break a large problem in modules and the interactions that you define between different modules.

2. **System design:** System design interviews has questions like, "How will you design a photo sharing service?" or "How will you design a service like Quora?", etc. here the focus is to see how you can design an abstract system that is scalable.

Object oriented design is covered thru a case study. And System design is not covered as part of this course. If you have 5+ years of industry experience, then one round of mock interview will be conducted that focus on System design.

DBMS

This is in addition to the 45 days course, we cover 2 extra days to discuss DBMS. This is relevant only for freshers and students in their final year.

* Course content and duration is subject to change without notice or approval.

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