JAVA LEVEL UP

OVERVIEW

The course will involve rigorous practice of questions based on **Sorting, Searching, Greedy Algorithms, Text processing, Backtracking, Dynamic Programming** along with comprehensive revision of data structures like **Stack, Queues, linked-lists, Trees, Tries, Graphs, Heaps, Hashing, Range Queries** etc. It is ideal for all those who aspire to gain expertise in DS and Algorithms or are appearing for their internship/placement procedure

MODULES

Recursion & Backtracking (Lecture 1- 8)

- Basics and Control Flow in recursion
- Recursion with arrays
- Recursion with ArrayLists
- Recursion on the way up
- Recursion and combinatorics
- Recursion with queens and knights
- Recursion and memory maps
- Advanced recursion – sudoku, crossword, bit masking

Outcome: This part lays a strong foundation for trees and graphs. "Peppers" invariably perform better than peers at recursive codes.

Complexity Analysis (Lecture 9 - 10)

- Time Complexity analysis
- Space Complexity
- Optimised Searching, Sorting and Hashing

Outcome: This part enables the student in analysing complexity of their codes and optimising them.

DP & Greedy (Lecture 11 - 16)

- Recursion to DP
- Memoization and Tabulation
- 1d DP
- 2d DP
- Classical DP Problems
- DP with Bit Masking
- Greedy vs DP

Outcome: This part prepares the student for competitive programming contests by laying a fairly strong foundation in dynamic programming.

Data Structures (Lecture 17 - 28)

Lesson Title	Topics
Stack and Queues	➔ Introduction and Implementation of Stack and Queue. ➔ Adapter Design Pattern. ➔ Application of Stack and Queue. ➔ Interview Questions.
Linked Lists	➔ Implementation of Linked List Data Structures. ➔ Application of Linked List. ➔ Iterator Design Pattern. ➔ Interview Questions.
Generic Tree	➔ Introduction of hierarchical Data Structure ➔ Implementation of Generic Tree. ➔ Application of Generic Tree ➔ Interview Questions
Binary Tree	➔ Implementation of Binary tree ➔ Application of Binary Tree ➔ Interview Questions

Outcome: This part emphasises on subtleties of linear and hierarchical data structures. Linked Lists and Trees feature very prominently in interviews.

Advanced Data Structures (Lecture 29 - 36)

Lesson Title	Topics
BST & AVL	➔ Balancing property ➔ Implementation of BST and AVL ➔ Application of BST and AVL ➔ Interview Questions
HashMap	➔ Application of HashMap. ➔ Iterable vs Iterator ➔ Interview Questions.
Priority Queue	➔ Applications of Priority Queue ➔ Adapter Design pattern ➔ Arrays.sort & Collections.sort ➔ Comparable vs Comparator ➔ Interview Questions
Generics	➔ OOPs – generics, exceptions, interfaces ➔ Generic Priority Queue creation ➔ Generics Linked List creation ➔ Generic HashMap creation
Range Queries	➔ Segment Tree ➔ Modular Segment Tree ➔ Lazy Segment Tree ➔ Square Root Decomposition ➔ Sparse Table

Outcome: Besides preparing the student via a lot of interview questions, this part makes the student industry ready by retouching on key OOPs concepts.

Graphs & Text Processing (Lecture 37 - 44)

- Adj. matrix implementation.
- DFS and it's Applications
- BFS and its Applications
- Dijkstra, Prims, Kruskals, Bipartite
- DAG implementation, Topological sort
- Bellman ford & Floyd Warshall
- Trie and Huffman Encoder
- Rabin Karp, KMP, Z, Manachers

Outcome: This part adds the "x-factor" in student by doing a lot of practice on graphs and key text processing algorithms.

"Pep" Effect

1. **Videos:** Online videos for important topics to help revise and cover missed classes.
2. **Assignment:** Practice hundreds of high quality question given as Hacker rank Assignment.
3. **Doubt Support:** Online TAs help in prompt doubt support. **1-12 TA to student ratio in classes.**
4. **Revision Option**: We provide our students with unlimited revision option so they can revise as many times they want that to free of cost.
5. **Back-up Class:** We provide catch up classes via doubts teacher in case you miss one.

FACULTY

1. Sumeet Malik – 9 years of experience – across C#, C++, Java, JavaScript and web technologies
2. 4 years of teaching experience in Nagarro and Coding Blocks.

PATH AHEAD

This course covers a lot of ground for a starter. Now you are ready to explore more.

- ✓ You may like to learn how to develop apps and websites. We have a "Dev" course to help you there.
- ✓ You may like to compete online for bagging placements and internships. We have a "Interview Prep" course for that purpose.

LET'S TALK

1. Call us on **011-4019-4461**, or
2. Walk in our centre at **KD-189, Pitampura, Near Kohat Enclave Metro station**, or
3. Our FB page – **facebook.com/pepcoding**
4. Visit www.pepcoding.com.