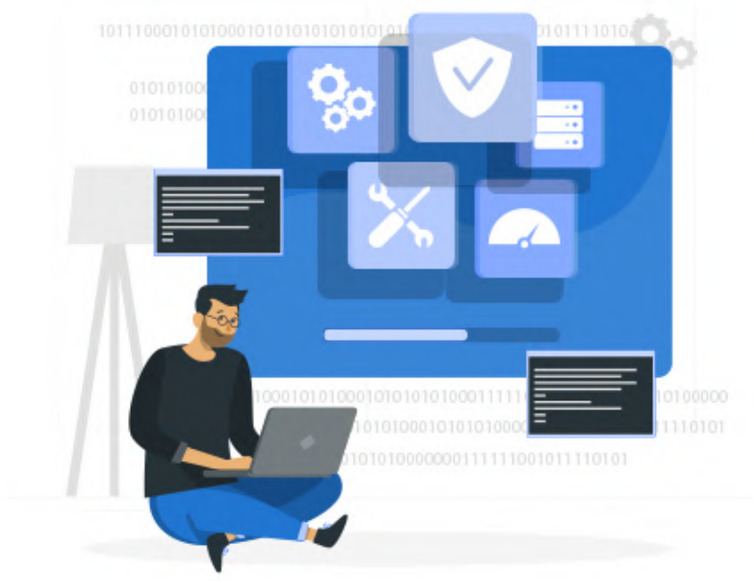
BOSSCODER ACADEMY X REVANTH MURIGIPUDI

HOW TO MASTER PROBLEM SOLVING IN DSA BASIC TO ADVANCE



DISCLAIMER

This is an **action-oriented** document, when you tick all the boxes consider yourself prepared for the **DSA**

BOSSCODER ACADEMY

2-4 weeks

FUNDAMENTALS OF A LANGUAGE

- ☐ Learn + command any 1 language.
  Be it c++/java/python or any other

- ☐ Solve lots of basic problems to learn the syntax of the language Ex:- prime number, palindrome, Armstrong number, patterns problems, etc

- ☐ Solve problems along with the theory of the Language

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4 weeks

BABY STEPS

- Start basic DSA topics to get hands-on with problem-solving
- Kick start Data Structure with

- [ ] Arrays
- [ ] Strings
- [ ] Stacks
- [ ] Queues
- [ ] Linked lists
- [ ] Hashmaps
- [ ] Set

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- In Algorithm cover
  - Searching - Linear, naive binary search
  - Sorting - Bubble, insertion, selection
  - Greedy - Don't ignore! Helps in understanding basic implementation
  - Recursion & backtracking
- Time & space complexities - Try to understand the time + space complexity with each problem you solve
- DSA practical knowledge is equally important as theoretical. Do not skip on either

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2-4 weeks

ROME WASN'T BUILT IN A **DAY!**

- ☐ Decode & solve the problem at your pace
- ☐ Blocked and feel like quitting? Remember WHY you began!
- ☐ Take small breaks & resume again
- ☐ It's okay to look at the solution if you get blocked by a question

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- In Advance Algorithms
  - **Searching** → Modified binary search
  - **Sorting** → Merge sort, quick sort, heap sort
  - **Arrays** → Two/Three-pointer, Sliding window, kadane's algorithm, merge sort/intervals logic etc
  - **Strings** → Substrings, subsequences, pattern matching, lexicographic ordering, etc
  - **Binary trees & Binary search trees** → Traversals like Inorder, preorder, postorder, morris traversal (both iterative & recursive)

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- In Advance Algorithms
  - **Graphs** → Depth-first search (DFS), breadth-first search (BFS), topological sort, cycle detection, minimum spanning tree (MST) - Prims & Kruskals, Dijkstra, Bellman-Ford, Floyd Warshall, disjoint set union (union)
  - **Divide & Conquer**
  - **Dynamic programming** → Memoization, tabulation

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8-12 weeks

TIME TO ADVANCE

- Start basic DSA topics to get hands-on with problem-solving
- In advance Data Structure
  - [ ] Trees - Binary Trees & Binary search trees
  - [ ] Graphs
  - [ ] Heaps
  - [ ] Tries

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CONTESTS TO THE RESCUE

- ☐ Simulates **real interview** timed situations
- ☐ Makes you think of solutions faster under **time pressure**
- ☐ Helps you **assess your ability** to come up with your own solutions
- ☐ **Boosts confidence**

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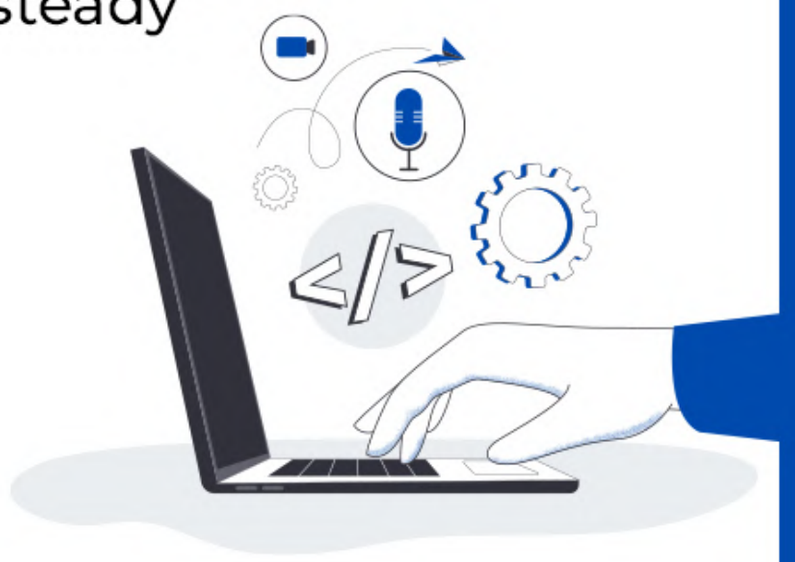
KEEP REVISING

- ☐ Note down the **patterns** encountered while solving problems
- ☐ Don’t solve random problems, **go topic by topic**
- ☐ **Revisit patterns** + **problems** every 2 weeks to keep the basics strong & steady



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MISCELLANEOUS TOPICS

- [ ] Bit manipulation
- [ ] Segment trees
- [ ] Number theory
- [ ] Focus more on **fundamentals** and you'll be able to approach most problems

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DON'T FORGET

- [ ] That comparing with others, won't help you!
- [ ] Document your growth & assess how far you have come
- [ ] That a placement mindset can harm your learning phase
- [ ] Set a timeline target & try to master in that

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