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WIZARD OF AL

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ON DATA STRUCTURES & ALGORITHMS

Wizard of AL isn't a series of dry lectures or boring slides. Instead, you'll learn **Data Structures and Algorithms** as part of a magical tale - where every concept is a spell, every problem is a puzzle, and every data structure is a tool in the Wizard's arsenal. You won't just study stacks, queues, trees, and graphs - you'll live them through quests, animated stories, hands-on challenges, and real-world analogies.

Each lesson unfolds as part of the Wizard's journey, where you solve problems with him, learn new techniques, and level up your algorithmic powers. It's **DSA** like you've never experienced before - fun, immersive, and unforgettable.

HYBRID CLASSES - ONSITE & ONLINE

Code with us from the classroom or your home. Our hybrid classes let you join the fun from anywhere on Earth (or beyond, if your Wi-Fi's good enough).



ONSITE

If you're in Bangalore, come join your classmates at Ace Hacker, J.P. Nagar 7th Phase. But if you're anywhere else on the planet, no worries - you can beam into the same class online from wherever you are.



ONLINE

Whether you're tuning in from Tokyo, Timbuktu, or just too tired to travel across Bangalore - join us online from anywhere. World-class algorithmic fun is guaranteed no matter your pin code. All you need is a screen, and an internet connection.





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Ch.	Description
01	<p>The Awakening of the Wizard</p> <p>In this opening chapter, the Wizard of AL receives a vision of an impending crisis but doesn't know when or how it will strike. To prepare, he revisits the ancient scrolls (complexity theory) to assess how much magical energy each known algorithm consumes and which ones scale well under duress.</p> <ul style="list-style-type: none"> • Introduction to the mythical land of AL • Why algorithms matter: Foundations of problem solving • What is a Data Structure? • Time & Space Complexity (Big-O Notation) explained like magical energy cost. • DSA Concepts: <ul style="list-style-type: none"> ➤ Algorithm complexity ➤ Big-O Notation ➤ Performance analysis ➤ Algorithm design basics • Real-life tie-in: Time vs space trade-offs, choosing between fast vs. memory-efficient solutions. • Challenge: The Oracle's Prediction - Decipher scrolls with different spells (algorithms). Predict which spell will work fastest against a spreading magical glitch. Time complexity vs. memory usage is the key.
02	<p>The Spell of Selection</p> <p>In the "Valley of Lost Things", villagers spend hours searching for items in massive storage caves. The Wizard introduces them to Linear Search (for unsorted piles) and Binary Search (once items are organized magically).</p> <ul style="list-style-type: none"> • How to choose the right spell (search method) for the right problem • DSA Concepts: <ul style="list-style-type: none"> ➤ Linear Search ➤ Binary Search • Real-life tie-in: Searching contact lists, dictionaries, lost keys • Challenge: Find the Dragon's Tooth - Search through unorganized vs. sorted piles of relics to find the missing tooth of an ancient dragon. Use magic goggles that simulate different search algorithms.
03	<p>The Tale of Two Sorters</p> <p>Two sorting apprentices argue daily in the Wizard's tower. One always arranges things by comparing every item (Bubble Sort), the other inserts things one by one in the right spot (Insertion Sort). The Wizard challenges them with sorting a tavern's order list during a festival.</p> <ul style="list-style-type: none"> • DSA Concepts: Bubble Sort, Insertion Sort, Selection Sort <ul style="list-style-type: none"> ➤ Bubble Sort ➤ Insertion Sort ➤ Selection Sort • Real-life tie-in: Sorting papers, emails, groceries manually. Sorting habits and efficiencies in everyday life • Challenge: The Festival of Falling Feathers - The Wizard's tower is filled with magical feathers falling from above. Sort them in order of magical charge using different sorting styles before they vanish.
04	<p>The Sorcery of Swifter Sorting</p> <p>The Kingdom of AL is overwhelmed with magical letters. The Wizard uses Merge Sort (splitting teams) and Quick Sort (smart pivot strategy) to help the couriers.</p> <ul style="list-style-type: none"> • DSA Concepts: <ul style="list-style-type: none"> ➤ Merge sort ➤ Quick sort ➤ Divide & Conquer • Real-life tie-in: Multi-threaded document sorting, fast filing systems. Divide-and-conquer thinking in decision-making. • Challenge: The Duel of Divide & Conquer - Face two rival Sorting Knights. Beat them by choosing the correct divide-and-conquer strategy to sort enemy armies by strength before battle.





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05	<p>The Wizard's Bag of Tricks The Wizard helps a potion-maker organize ingredients: some are best in rows (Arrays), others in a flexible chain (Linked List).</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Arrays Linked Lists Static vs Dynamic memory Real-life tie-in: Grocery lists, to-do apps, memory management. Choosing structures to fit task constraints. Challenge: Pack the Spell Bag - Help the Wizard pack his travel kit using arrays (fixed size) and linked lists (dynamic). Each item has a magical tag. Rearranging, inserting, and deleting affects the final spell strength.
06	<p>The Enchanted Stack Tower In the Temple of Echoes, spells must be reversed in order. The Wizard teaches monks to use Stacks to manage recursive chants.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Stack operations Recursion Real-life tie-in: Undo functionality, browser history, backtracking. Stack thinking in language and behavior. Challenge: Reverse the Forbidden Chant - Chants must be recited in reverse. Use stacks to simulate reversing spell scrolls with embedded recursion patterns. You'll lose if the call stack overflows!
07	<p>The Queue at Postal Gate At the Portal Gate, travelers are disorganized. The Wizard builds Queues and Priority Queues so the sick, elderly, and nobles get served faster.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Queues Priority Queues Circular Queues Real-life tie-in: Customer service lines, emergency rooms, CPU scheduling, Airplane Onboarding, Organ transplant list. Queuing theory and fairness. Challenge: Unlock the Portal - Manage the crowd at the portal. Prioritize nobles, sick villagers, and travelers. The wrong queue strategy will jam the portal and trap souls between dimensions.
08	<p>The Book of Trees In the Archives of AL, knowledge is stored in a Binary Tree. The Wizard must traverse the branches to unlock ancient secrets.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Tree traversal Binary Trees Real-life tie-in: File systems, decision trees, game UIs. How humans categorize and retrieve information. Challenge: The Whispering Woods Puzzle - Explore a mystical forest. Each tree branch is a clue. Use inorder, preorder, and postorder traversals to uncover the secret spell hidden at the roots.
09	<p>The Forest of Balanced Wisdom The Forest of AL becomes unbalanced, causing memory echoes. The Wizard uses AVL and Red-Black Trees to restore harmony.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Binary Search Trees (BSTs) Balanced Trees Real-life tie-in: Dynamic indexing in databases, balanced file search. Balancing systems in organizational design. Challenge: Restore the Tree of Balance - A magical tree grows unevenly and threatens the kingdom. Perform rotations and re-colorings to restore equilibrium before the roots collapse the land.





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10	<p>The Map of Hashing Hallows</p> <p>The Wizard enters the Hashing Hollows, where treasure chests are unlocked only with perfect hash spells. Collisions lead to curses.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Hashing Collisions Chaining Open Addressing Real-life tie-in: Password systems, indexing, digital keys. Memory allocation and lookup optimization. Challenge: Break the Hash Curse - Unlock 10 treasure chests using hash keys. Beware of collisions- choose chaining or probing carefully or the wrong chest releases a mimic.
11	<p>The Wizard and the Graph Oracle</p> <p>The Wizard consults the Oracle to model the interconnected cities of AL using Graphs, discovering a network of roads, relationships, and magic veins.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Graphs Adjacency list/matrix Real-life tie-in: Social networks, traffic maps, utilities. Relationship mapping in urban planning and social analysis Challenge: Map the Spider Kingdom - Draw the map of a web-like city using adjacency lists and matrices. The better your map, the faster you can rescue the kidnapped potion master.
12	<p>The Journey through Dijkstra's Dungeon</p> <p>To escape a cursed dungeon, the Wizard must find the shortest path through a maze filled with toll gates. He teaches villagers Dijkstra's Algorithm to navigate safely.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Shortest path algorithms Greedy Algorithms and cost-based decisions Real-life tie-in: GPS navigation, cost-based planning. Efficient routing and resource allocation. Challenge: Escape the Dungeon of Tollgates - You must escape a dungeon where every step has a cost. Find the shortest and cheapest path to freedom using Dijkstra's enchanted boots.
13	<p>The Hidden Path of Depth & Breadth</p> <p>The Wizard helps a child lost in the Maze of Mind by using DFS to go deep and BFS to find the shortest exit.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Depth-First Search (DFS) Breadth-First Search (BFS) Real-life tie-in: Network crawling, puzzle solving, decision trees. Decision-making with different strategies. Challenge: The Crystal Maze - Traverse a shifting labyrinth that changes with your choices. One path rewards depth (DFS); another rewards exploration (BFS). Choose wisely.
14	<p>The Wizard's Guide to Recursion</p> <p>The Wizard helps a bard write a song that sings itself using recursive structures.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> Recursive thinking Stack frames Real-life tie-in: Fractals in art, nested problems. Recursive patterns in logic and creativity. Challenge: Spell Within A Spell - You're stuck in a recursive dream. Solve nested logic puzzles where solving one reveals two more. Escape the recursion before time runs out.





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15	The Scroll of Dynamic Memories In the Memory Vault, magical creatures forget unless reminded. The Wizard introduces Dynamic Programming to optimize spell energy. <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Memoization ➡ Tabulation Real-life tie-in: Budget planning, caching in apps. How memory and repetition improve efficiency Challenge: Defend the Memory Vault - Monsters erase memory tiles. Use memoization and tabulation to protect known outcomes and reconstruct the Vault's defense system faster than the attack.
16	The Greedy Portion Maker A potion maker wants to make the best potion with limited ingredients. The Wizard teaches Greedy Algorithms, showing when they do (and don't) work. <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Greedy strategies ➡ Huffman coding Real-life tie-in: Cashier coin change, decision-making under pressure. Local vs global optimization in life. Challenge: Potion Panic - Create the most powerful potion from limited magical ingredients. Pick the most valuable ingredients, but some greedy strategies lead to unstable brews.
17	The Merge of Kingdoms Two rival kingdoms want to unify their libraries. The Wizard proposes a Merge Sort plan that preserves order and harmony. <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Divide & Conquer revisited Real-life tie-in: Merging datasets, version control. Conflict resolution via structured merging. Challenge: Unite the Royal Archives - Merge two ancient scroll libraries without losing any spells. Some scrolls are duplicates, others are cursed - sort and merge without triggering traps.
18	The Wizard's Tower of Complexity The Wizard explains why teleportation (log time) is better than walking (linear time) when searching the kingdom records. <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Complexity tiers ➡ Comparison of algorithms Real-life tie-in: Choosing efficient strategies for work/life tasks Decision-efficiency and resource use. Challenge: Test the Time Spells - Cast 5 different sorting spells on various test cases. Analyze which one performs best based on case size and magic cost. Rank them by efficiency.
19	The Curse of Circular Problems Villagers are stuck in a cursed game where every wrong step restarts the loop. The Wizard teaches them Backtracking to find the right path. <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Backtracking ➡ N-Queens ➡ Sudoku Real-life tie-in: Puzzle solving, debugging, escape rooms. Trial-and-error decision paths Challenge: Break the Curse of Infinite Loops - You're trapped in a circular riddle where every wrong path loops you back. Use backtracking to escape, solve the maze, and break the curse.





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20	<p>The Algorithm of Love</p> <p>In the village of Heartwood, couples divorce often. The Wizard introduces the Stable Marriage Algorithm to match them better.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Gale-Shapley ➡ Stable Matching Real-life tie-in: Job placements, dating apps. Algorithmic fairness in matchmaking. Challenge: The Heartwood Matchmaker - Villagers are unhappily matched. Use Gale-Shapley logic to create stable pairs for love, jobs, and even pet adoption - all while managing biases and preferences.
21	<p>The Parking Predicament of Pubtown</p> <p>In a town full of pubs, bullock carts block roads due to bad parking. The Wizard teaches Optimal Stopping Theory so villagers know when to stop looking and park.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Secretary Problem Real-life tie-in: Apartment hunting, dating, parking. Exploration vs. exploitation trade-offs Challenge: Find the Perfect Spot - Bullock cart drivers keep circling the tavern, missing perfect spots. Simulate the 37% rule of Optimal Stopping to teach them when to say "this is the one!"
22	<p>The Final Battle and The Secret Algorithm</p> <p>The ultimate challenge: a magical calamity combining all problems - searching a forest, sorting ingredients, choosing allies, and planning an attack. The Wizard must use every algorithm learned. Students apply all concepts in a capstone quest to restore the land of AL.</p> <ul style="list-style-type: none"> DSA Concepts: <ul style="list-style-type: none"> ➡ Integration of all topics Real-life tie-in: Capstone problem-solving. Life as a sequence of algorithmic decisions. Challenge: The Battle for the Algorithmic Crown - Use all learned algorithms to solve the Final Quest: optimizing a kingdom-wide rescue mission. Graph traversal, sorting supplies, assigning tasks, and choosing the best moment to strike are all on you.

Need more information?

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