

## Difficulty Level Question

### Easy (20)

1. Reverse a string
2. Check if a number is even or odd
3. Find the largest number in an array
4. Count the number of vowels in a string
5. Find the factorial of a number
6. Check if a string is a palindrome
7. Sum all numbers in an array
8. Find the average of numbers in an array
9. Remove duplicates from an array
10. Find the length of a string
11. Check if a string contains a specific substring
12. Convert a string to lowercase
13. Convert a string to uppercase
14. Concatenate two strings
15. Find the maximum value in an object
16. Check if an array is sorted
17. Count the number of words in a string
18. Find the index of a specific element in an array
19. Replace all occurrences of a substring in a string
20. Remove whitespace from the beginning and end of a string

### Medium (30) 1. Merge two sorted arrays

2. Find the median of an array
3. Implement a basic calculator
4. Check if two strings are anagrams
5. Rotate an array to the right by k positions

6. Remove all falsy values from an array
7. Implement a queue using two stacks
8. Find the longest substring without repeating characters
9. Check if a number is a prime number
10. Find all pairs in an array that sum up to a specific value
11. Find the intersection of two arrays
12. Check if a string is a valid number
13. Calculate the nth Fibonacci number
14. Flatten a nested array
15. Convert a number to its binary representation
16. Find the common elements between two arrays
17. Implement a basic todo list
18. Find the longest word in a string
19. Calculate the power of a number
20. Check if a string contains only digits
21. Find the unique elements in an array
22. Implement a simple debounce function
23. Count the number of occurrences of each character in a string
24. Find the first non-repeating character in a string
25. Convert a binary string to a decimal number
26. Implement a simple event emitter
27. Determine the longest sequence of consecutive numbers in an array
28. Check if a string is a valid email address
29. Count the number of elements in an array greater than a specific value
30. Implement a basic throttle function

#### Advanced (50)

1. Implement a linked list
2. Find the shortest path in a graph

3. Solve the N-Queens problem
4. Implement a binary search tree
5. Find all permutations of a string
6. Perform a depth-first search on a tree
7. Implement a priority queue
8. Solve the knapsack problem
9. Find the longest common subsequence of two strings
10. Implement a hash table
11. Solve the traveling salesman problem
12. Implement a red-black tree
13. Solve the Sudoku puzzle
14. Perform a breadth-first search on a graph
15. Implement a LRU (Least Recently Used) cache
16. Solve the maximum subarray problem
17. Calculate the minimum spanning tree
18. Find the shortest path between two nodes in a graph
19. Implement a Trie (prefix tree)
20. Solve the Longest Increasing Subsequence problem
21. Find all subsets of a set
22. Implement a segment tree
23. Solve the 0/1 knapsack problem
24. Find the median of two sorted arrays
25. Solve the Rat in a Maze problem
26. Implement a merge sort algorithm
27. Find the maximum product of two integers in an array
28. Solve the coin change problem
29. Implement a bubble sort algorithm
30. Find the longest palindromic substring
31. Find all possible combinations of a given set
32. Implement a quick sort algorithm
33. Solve the binary tree maximum path sum problem

34. Find the top k frequent elements in an array
35. Implement a heap data structure
36. Find the intersection of multiple arrays
37. Solve the longest valid parenthesis substring problem
38. Implement a counting sort algorithm
39. Solve the expression evaluation problem
40. Find the longest sequence of consecutive elements in an array
41. Implement a depth-first traversal of a graph
42. Solve the longest palindrome subsequence problem
43. Find the shortest path in a weighted graph
44. Implement a K-way merge algorithm
45. Find the maximum sum subarray of a given size
46. Solve the permutation sequence problem
47. Implement a breadth-first traversal of a graph
48. Find all unique paths in a matrix
49. Solve the number of islands problem
50. Implement an AVL tree

#### Very Advanced (100)

1. Solve the traveling salesman problem with dynamic programming
2. Implement a distributed hash table
3. Solve the matrix chain multiplication problem
4. Implement a B-tree
5. Solve the Longest Common Substring problem
6. Implement a suffix tree
7. Solve the minimum edit distance problem
8. Implement a K-nearest neighbors algorithm
9. Solve the all-pairs shortest path problem
10. Implement a Bloom filter

11. Solve the max flow problem using Ford-Fulkerson algorithm
12. Implement a matrix exponentiation algorithm
13. Solve the knapsack problem using branch and bound
14. Implement a Monte Carlo simulation
15. Solve the maximum bipartite matching problem
16. Implement a multi-dimensional search tree
17. Solve the optimal binary search tree problem
18. Implement a genetic algorithm
19. Solve the set cover problem
20. Implement a hash-based algorithm for large-scale data processing
21. Solve the job scheduling problem
22. Implement a quantum computing simulation
23. Solve the job sequencing problem
24. Implement a distributed system algorithm
25. Solve the linear programming problem
26. Implement a neural network for machine learning
27. Solve the convex hull problem
28. Implement a machine learning algorithm from scratch
29. Solve the sequence alignment problem
30. Implement a real-time data processing system
31. Solve the minimal spanning tree problem using Kruskal's algorithm
32. Implement a real-time collaborative editing system
33. Solve the multidimensional knapsack problem
34. Implement an efficient search algorithm for large datasets
35. Solve the cycle detection problem in a graph
36. Implement a distributed computing framework
37. Solve the optimal task scheduling problem
38. Implement a real-time recommendation system
39. Solve the large-scale optimization problem
40. Implement a data compression algorithm
41. Solve the data clustering problem

42. Implement a robust error correction algorithm
43. Solve the multi-agent system problem
44. Implement a predictive analytics model
45. Solve the large-scale data integration problem
46. Implement a distributed ledger technology
47. Solve the network flow problem using advanced algorithms
48. Implement a decentralized system
49. Solve the probabilistic data structure problem
50. Implement an artificial intelligence algorithm
51. Solve the complex network analysis problem
52. Implement an advanced cryptography algorithm
53. Solve the distributed database problem
54. Implement a large-scale graph processing system
55. Solve the big data analysis problem
56. Implement a scalable web application
57. Solve the time-series forecasting problem
58. Implement a sophisticated search engine
59. Solve the resource allocation problem
60. Implement a real-time streaming data system
61. Solve the robust machine learning problem
62. Implement a complex event processing system
63. Solve the advanced data warehousing problem
64. Implement a high-performance computing system
65. Solve the distributed algorithm problem
66. Implement a scalable cloud infrastructure
67. Solve the secure communication problem
68. Implement an advanced data mining algorithm
69. Solve the complex system simulation problem
70. Implement a high-availability system
71. Solve the advanced anomaly detection problem
72. Implement a large-scale machine learning pipeline

73. Solve the real-time data visualization problem
74. Implement a complex web crawler
75. Solve the advanced recommendation engine problem
76. Implement a sophisticated data integration system
77. Solve the high-dimensional data analysis problem
78. Implement a scalable search index
79. Solve the large-scale event processing problem
80. Implement a robust data security system
81. Solve the distributed transaction management problem
82. Implement a high-performance data retrieval system
83. Solve the advanced pattern recognition problem
84. Implement a real-time analytics platform
85. Solve the large-scale text analysis problem
86. Implement an advanced recommendation algorithm
87. Solve the secure data sharing problem
88. Implement a distributed computational system
89. Solve the real-time data fusion problem
90. Implement a complex network simulation
91. Solve the advanced user behavior analysis problem
92. Implement a scalable data processing framework
93. Solve the distributed machine learning problem
94. Implement an efficient cloud storage system
95. Solve the high-dimensional clustering problem
96. Implement a complex predictive model
97. Solve the advanced system performance optimization problem
98. Implement a scalable data transformation system
99. Solve the real-time data synchronization problem
100. Implement an advanced decision support system