Graph Algorithms

1. Graph traversal algorithms visualization
2. Shortest path finder in a graph
3. Minimum Spanning Tree (MST) algorithms
4. Graph coloring algorithms
5. Eulerian path/circuit detection
6. Network flow algorithms (Max flow, Min cut)
7. Topological sorting
8. Bipartite graph detection
9. Strongly connected components detection
10. Graph clustering algorithms

Sorting and Searching

11. Sorting visualizer
12. Implementing different sorting algorithms (Bubble, Selection, Insertion, Merge, Quick)
13. External sorting techniques
14. Searching algorithms (Binary search, Interpolation search)
15. Efficient text searching algorithms (Boyer-Moore, Knuth-Morris-Pratt)

Trees and Binary Search Trees (BST)

16. Binary search tree operations (insert, delete, search)
17. AVL tree implementation
18. Red-Black tree implementation
19. Heap data structure (Min heap, Max heap)
20. Binary Indexed Tree (Fenwick Tree)

Dynamic Programming

21. Knapsack problem solver
22. Longest Common Subsequence (LCS)
23. Matrix chain multiplication
24. Optimal binary search tree
25. Edit distance problem

Array Algorithms

26. Array reversal
27. Array rotation
28. Finding majority element
29. K-th smallest/largest element

30. Subarray with maximum sum (Kadane's algorithm)

String Algorithms

31. String matching algorithms (Naive, Rabin-Karp, KMP)
32. Longest Palindromic Substring
33. Anagram detection
34. String compression
35. Regular expression matcher

Hashing

36. Hash table implementation
37. Collision resolution techniques
38. Implementing a hash map
39. Hash-based set operations
40. String hashing

Backtracking

41. N-Queens problem
42. Sudoku solver
43. Knight's tour problem
44. Subset sum problem
45. Generating all permutations

Divide and Conquer

46. Matrix multiplication
47. Closest pair of points
48. Strassen's matrix multiplication
49. Finding the majority element
50. Counting inversions in an array

Greedy Algorithms

51. Fractional knapsack problem
52. Activity selection problem
53. Huffman coding
54. Job sequencing with deadlines
55. Minimum spanning tree

Computational Geometry

56. Convex hull algorithms (Graham scan, Jarvis march)
57. Line intersection
58. Closest pair of points in 2D
59. Point location
60. Polygon triangulation

Number Theory

61. Prime number generation
62. Sieve of Eratosthenes
63. Modular arithmetic operations
64. Greatest Common Divisor (GCD)
65. Generating Fibonacci numbers

Miscellaneous

66. LRU Cache implementation
67. Big integer arithmetic
68. Randomized algorithms (Quickselect, Randomized Quicksort)
69. Finding connected components in a graph
70. Optimal scheduling algorithms

Data Structures

71. Implementation of linked list
72. Circular buffer
73. Deque implementation
74. Skip list
75. Suffix array

Parallel Algorithms

76. Parallel sorting algorithms
77. Parallel matrix multiplication
78. Parallel graph algorithms
79. Distributed hash table
80. Parallelized search algorithms

Machine Learning with DSA

81. Decision tree construction
82. k-nearest neighbors algorithm
83. Clustering algorithms (k-means, hierarchical)
84. Association rule mining (Apriori algorithm)

85. Neural network optimizations using DSA

Game Algorithms

86. Pathfinding algorithms in games
87. Game tree traversal
88. AI decision-making algorithms
89. Optimizing game performance using DSA
90. Real-time strategy game AI

Bioinformatics Algorithms

91. Sequence alignment algorithms
92. Genome assembly algorithms
93. Phylogenetic tree construction
94. Molecular docking algorithms
95. Protein structure prediction using DSA

Cryptography

96. RSA algorithm implementation
97. Elliptic curve cryptography
98. Hash functions (MD5, SHA-1)
99. Cryptographic protocol implementations
100. Digital signatures using DSA

Operating System Algorithms

101. Disk scheduling algorithms
102. Page replacement algorithms
103. Concurrency control algorithms
104. Deadlock detection and prevention
105. File system algorithms

Web Development with DSA

106. Implementing data structures in JavaScript
107. Optimizing algorithms for server-side operations
108. Real-time data processing with DSA
109. Efficient data retrieval algorithms for web apps
110. Algorithmic approaches to web security

IoT and Embedded Systems

111. Efficient data structures for memory-constrained devices
112. Sensor data processing algorithms
113. Real-time decision-making algorithms
114. Embedded system task scheduling
115. Power-efficient algorithms for IoT

Robotics Algorithms

116. Path planning algorithms for robots
117. Simultaneous Localization and Mapping (SLAM)
118. Robot control algorithms
119. Collision avoidance algorithms
120. Optimizing robot movements using DSA

Natural Language Processing (NLP)

121. Text parsing algorithms
122. Word segmentation algorithms
123. Named Entity Recognition (NER)
124. Sentiment analysis algorithms
125. Language translation algorithms

Image Processing Algorithms

126. Edge detection algorithms
127. Image segmentation
128. Object recognition algorithms
129. Image compression algorithms
130. Efficient pixel manipulation using DSA

Financial Algorithms

131. Stock trading algorithms
132. Portfolio optimization algorithms
133. Risk management algorithms
134. Algorithmic trading strategies
135. Financial forecasting using DSA

Healthcare Algorithms

136. Medical image analysis algorithms
137. Health data analytics algorithms
138. Disease prediction algorithms
139. Patient monitoring algorithms

140. Clinical decision support systems

Social Media Algorithms

141. Friend recommendation algorithms
142. Content recommendation algorithms
143. Social network analysis algorithms
144. Sentiment analysis of social media data
145. Trend prediction algorithms

Environmental Algorithms

146. Climate modeling algorithms
147. Natural disaster prediction algorithms
148. Ecosystem simulation algorithms
149. Environmental monitoring algorithms
150. Resource optimization algorithms

Educational Algorithms

151. Adaptive learning algorithms
152. Student performance prediction
153. Personalized learning path algorithms
154. Automated grading algorithms
155. Content recommendation for learners

Transportation Algorithms

156. Route planning algorithms
157. Traffic flow optimization
158. Public transport scheduling
159. Vehicle routing algorithms
160. Real-time congestion management

Logistics Algorithms

161. Inventory management algorithms
162. Warehouse optimization algorithms
163. Supply chain optimization
164. Predictive maintenance algorithms
165. Delivery route optimization

Energy Sector Algorithms

166. Smart grid optimization
167. Energy consumption forecasting
168. Renewable energy integration algorithms
169. Grid stability algorithms
170. Energy-efficient algorithms for devices

Aerospace Algorithms

171. Flight trajectory optimization
172. Aircraft maintenance scheduling
173. Aircraft routing algorithms
174. Weather prediction algorithms for aviation
175. Satellite trajectory prediction

Gaming Algorithms

176. Pathfinding algorithms in games
177. AI decision-making algorithms
178. Behavior tree implementation
179. Real-time strategy game AI
180. Procedural content generation

Music and Audio Algorithms

181. Audio compression algorithms
182. Sound recognition algorithms
183. Music recommendation algorithms
184. Real-time audio processing
185. Pitch detection algorithms

Augmented Reality (AR) and Virtual Reality (VR)

186. Spatial mapping algorithms
187. Real-time rendering optimization
188. Gesture recognition algorithms
189. Environment interaction algorithms
190. User behavior prediction

Quantum Computing Algorithms

191. Quantum search algorithms
192. Quantum key distribution algorithms
193. Quantum error correction algorithms
194. Quantum simulation algorithms

195. Quantum machine learning algorithms

Blockchain Algorithms

196. Consensus algorithms (Proof of Work, Proof of Stake)
197. Smart contract algorithms
198. Cryptocurrency transaction verification
199. Blockchain data structures
200. Blockchain scalability algorithms