

1. Write a program in C to search an element from n numbers of an array using an algorithm whose time complexity is $O(n)$.
2. Write a program in C to search an element from a sorted array having n elements using an algorithm whose complexity is $O(\log(n))$.
3. Write a program in C to search an element from a sorted array having n elements using an algorithm whose complexity is $O(\log(\log(n)))$.
4. Write programs in C to solve the following problems using recursion:
 - a. Calculate the factorial of a given number.
 - b. Calculate the sum of digits of a number.
 - c. Convert a given decimal number to binary.
5. Write a program in C for sorting an array of n numbers of elements using any algorithm having best case time complexity of $O(n^2)$.
6. Write a program in C for sorting an array of n numbers of elements using any algorithm having worst and average case time complexity of $O(n^2)$.
7. Write a program in C for sorting an array of n numbers of elements using the following algorithms:
 - a. Merge Sort.
 - b. Quick Sort.
 - c. Heap Sort.
8. Write a program in C to implement the Strassen's Algorithm for matrix multiplication.
9. Write a program in C to solve the fractional knapsack problem using the greedy approach.
10. Write a program in C for solving the Job Sequencing problem.
11. Write programs in C to calculate the Nth Fibonacci number recursively using a naive approach and the dynamic programming approach. Demonstrate the performance improvement of the DP approach.
12. Given a sequence of matrix dimensions as input, write a program in C to calculate the minimum number of scalar multiplications required to multiply those matrices.
13. Write a program in C to solve the 0/1 knapsack problem using the dynamic programming approach.
14. Write a program in C to implement BFS and DFS algorithms for traversing through a graph.
15. Write a program in C to construct the minimum spanning tree from any directed or undirected graph using Prim's algorithm.
16. Write a program in C to construct the minimum spanning tree from any directed or undirected graph using Kruskal's algorithm.
17. Write a program in C to find the shortest path between two given nodes in a graph using Dijkstra's algorithm.
18. Write a program in C to find the shortest path between two given nodes in a graph using the Bellman Ford algorithm and demonstrate how it performs for a graph having negative edges.
19. Write a program in C to find the shortest path between all nodes in a graph using the Floyd-Warshall algorithm.
20. Write a program in C to implement the n-queens problem.
21. Write programs in C to compare string matching using the naive algorithm and KMP algorithm.