Design and Analysis of Algorithm / PC-CS493

Guidelines

1.Using Divide and Conquer Technique write a C program to implement Binary Search. Mention the Compiler used in your program. Analyze the complexity of Binary Search.

Algorithm: Write recursive algorithm from Fundamentals of Computer Algorithms – Ellis

Horowitz, Satraj Sahni, Sanguthevar Rajasekaran

2. Using Divide and Conquer Technique write a C program to implement Merge Sort. Mention the Compiler used in your program. Analyze the complexity of the implemented Sorting Algorithm.

3. Using Divide and Conquer Technique write a C program to implement Quick Sort. Mention the Compiler used in your program. Analyze the complexity of the implemented sorting algorithm.

4. Using Divide and Conquer Technique write a C program to implement MaxMin Problem. Mention the Compiler used in your program. Analyze the complexity value of your program.

5. Implement Fractional Knapsack Problem using appropriate algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. [For Algorithm and Analysis follow Class Notes or Refer Sahni's Book]

6. Implement Job sequencing with deadlines problem using appropriate algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. [For Algorithm and Analysis follow Class Notes or Refer Sahni's Book]

7. Implement Matrix Chain problem to find the minimum number of scalar multiplication needed using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. [For Algorithm and Analysis follow Class Notes or Refer Cormen's Book]

8. Implement MST Problem using appropriate algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. (Ref.: Sahni)

9. Implement MST Problem using Kruskal's algorithm. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. (Ref.: Sahni / Cormen)

10. Implement Single Source Shortest Path problem using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. (Ref.: Cormen)

11. Implement Single Source Shortest Path problem, allowing negative edge weights, using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. (Ref.: Cormen)

12. Implement All Pair of Shortest Path problem using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm. (Ref.: Cormen)

13. Implement TSP problem using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm.

14. Implement N-Queens problem using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm.

15. Implement Graph Coloring problem using proper algorithm design technique. Mention the Compiler used in your program. Analyze the complexity value of your algorithm.

16. Implement Hamiltonian problem. Mention the Compiler used in your program. Analyze the complexity value of your algorithm.

17. Implement 15-Puzzle problem. Mention the Compiler used in your program. Analyze the complexity value of your algorithm.

18. Suppose you have an Undirected Graph and your assignment is to traverse all vertices. Apply suitable algorithm for this traversal. Mention the Data Structure and Compiler used in your program. Analyze the complexity of your program in terms of time and memory usage.