Guidelines - 2

Design and Analysis of Algorithm Laboratory (PC-CS493)

Students are advised to follow the guidelines to prepare Laboratory Copy for PC-CS493:
1. Lab Copy should be prepared in your own handwriting using A4 Sheets
2. Only one side of the A4 sheets will be in use
3. Use proper format (given below) to prepare the Lab Copy
4. File up the A4 sheets by properly filling **top sheets (one per assignment)** and **index page**
5. The terminologies like **"Problem definition, Algorithm and others"** must be written in the lab report along with associated descriptions

Assignment Number 7

Problem definition: *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.

Algorithm: Write algorithm for Matrix Chain including parentheses algorithm using dynamic programming [Reference: Introduction to Algorithms by Cormen]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of Matrix Chain using dynamic programming [Reference: Introduction to Algorithms by Cormen]

Assignment Number 8

Problem definition: *Implement* MST Problem using appropriate algorithm design technique. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm.

Algorithm: Write Prims algorithm [Reference: Fundamentals of Computer Algorithms by Sahni]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of Prims Algorithm [Reference: Class Note / Fundamentals of Computer Algorithms by Sahni]

Assignment Number 10

Problem definition: *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.

Algorithm: Write Dijkstra's Algorithm [Reference: Introduction to Algorithms by Cormen]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of Dijkstra's Algorithm [Reference: Cormen]

Assignment Number 12

Problem definition: *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.

Algorithm: Write Floyd Warshall Algorithm [Reference: Class Note/ Cormen]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of Floyd Warshall Algorithm [Reference: Class Note/ Cormen]

Assignment Number 14

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

Algorithm: Write algorithm for N-Queens problem using backtracking [Reference: Fundamentals of Computer Algorithms by Sahni]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of N Queens Problem using backtracking method [Reference: Fundamentals of Computer Algorithms by Sahni]

Assignment Number 18

Problem definition: 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*.

Algorithm: Write DFS/ BFS algorithm [Reference: Class Note / Fundamentals of Computer Algorithms by Sahni]

Program Code: Write the code which you have made in Laboratory

Result and discussion: Write output of the code and provide a brief explanation of the output generated.

Complexity Analysis: Write the complexity analysis of DFS/ BFS [Reference: Class Note / Fundamentals of Computer Algorithms by Sahni]

Important Dates

Group	Assignment Number	Date of Assignment	Date of Submission
	7	18/4/2022	25/4/2022
	8	25/4/2022	23/5/2022
A	10	23/5/2022	30/5/2022
	12	30/5/2022	6/6/2022
	14	6/6/2022	13/6/2022
	18	13/6/2022	17/6/2022

Home Assignments

Problem Definition	Date of Assignments	Date of Submission
Assignment No.: 09 *Implement* MST Problem using Kruskal's algorithm. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm	25/4/2022	23/5/2022
Assignment No.: 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.	23/5/2022	30/5/2022
Assignment No.: 13 *Implement* TSP problem using proper algorithm design technique. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm.	30/5/2022	6/6/2022
Assignment No.: 15 *Implement* Graph Coloring problem using proper algorithm design technique. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm.	6/6/2022	13/6/2022
Assignment No.: 16 *Implement* Hamiltonian problem. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm.	6/6/2022	13/6/2022
Assignment No.: 17 *Implement* 15-Puzzle problem. Mention the Compiler used in your program. *Analyze* the complexity value of your algorithm.	13/6/2022	17/6/2022

1. For the above list of home assignments, you have to follow the same guidelines which you have maintained for regular assignments.
2. You have to write: **Problem definition, Algorithm, Program Code, Result and Discussion and Complexity Analysis for the home assignments also**.
3. For Home assignments, use **separate Index Page**
4. All home assignments should be arranged **after regular assignments, i.e. at last.**
5. For home assignments, **students may submit printed copies**.