III Year I Semester

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Code: 17CS513

DESIGN OF ALGORITHMS LAB

OBJECTIVES:

The course should enable the students to:

Learn how to analyze a problem and design the solution for the problem.

1. Design and implement efficient algorithms for a specified application.
2. Strengthen the ability to identify and apply the suitable algorithm for the given real world problem.

LIST OF EXPERIMENTS:

1. Write a program to implement Merge sort algorithm to sort a given set of elements
2. Write a program to implement Quick sort algorithm to sort a given set of elements
3. Write a program to implement Breadth First Search (BFS).
4. Write a program to implement Depth First Search (DFS).
5. Write a program to implement Tree Traversal techniques (Inorder, Preorder, Postorder)
6. Write a program to find Minimum Cost Spanning Tree of a given undirected graph using Prim's algorithm.
7. Write a program to find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm
8. Write a program to find shortest paths from a given vertex in a weighted connected graph to other vertices using Dijkstra's algorithm.
9. Write a program to implement All-Pairs Shortest Paths Problem using Floyd's algorithm.
10. Write a program to implement Warshall's algorithm.
11. Write a program to implement N Queen's problem using Back Tracking.
12. Write a program to find a subset of a given set S = {sl, s2,.....,sn} of n positive integers whose sum is equal to a given positive integer d. For ex, if S= {1, 2, 5, 6, 8} and d = 9 there are two solutions {1, 2, 6} and {1,8}.A suitable message is to be displayed if the given problem instance doesn't have a solution.

PROJECTS:

- Trapping Rain Water
- Check if a given sequence of moves for a robot is circular or not
- Chocolate distribution problem
- Stock Buy Sell to Maximize Profit

Word break problem

OUTCOMES:

- The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.
- The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

REFERENCE BOOKS:

1. Introduction to Algorithms 3rd Edition (English, Paperback, Al. Cormen)
2. Data Structures, Algorithms, And Applications In C++ by Satraj Sahni
3. Levitin A, "Introduction to the Design And Analysis of Algorithms, 2nd edition", Pearson Education, 2007.
4. Goodrich M.T.,R Tomassia, "Algorithm Design foundations Analysis and Internet Examples", John Wileyn and Sons, 2006.
5. Base Sara, Allen Van Gelder ," Computer Algorithms Introduction to Design and Analysis", Pearson, 3 rd Edition, 1999.