RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

Branch: CSBS

101009/IT400B
DESIGN AND ANALYSIS OF ALGORITHM

INSTRUCTIONS TO STUDENTS

Students should be regular and come prepared for the lab practice.

1. In case a student misses a class, it is his/her responsibility to complete that missed experiment(s) before he or she comes for the second lab after the missed class.
2. Students should bring the lab record with cycle stuck and the algorithm for the program to be done to it to all the lab. Prescribed textbook and class notes can be kept ready for reference if required.
3. Once the experiment(s) get executed, they should show the results to the instructors and copy the same in their observation book and get it verified before the next lab session.
4. The programs have to be implemented in C.

LAB CYCLE (2021- 25 BATCH)

Week 1:

1. Time Space Trade off Implementation

a. Let S be an integer array of n elements perform two operations

- remove(i)-I is removed from S
- next(i)- returns the next larger element j, where j>i, jε S, if such j exists. Implement the same using linked list.

b. Make observations on the two methods and comment on time-space tradeoff.

Week 2:

2. Time analysis of different sorting methods

Sort a given set of elements using the Quicksort and bubble sort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time

taken versus n. The elements can be generated using the random number generator.

Week 3,4:

3. **Dynamic programming implementation**

   Implement 0/1 Knapsack problem **,** Travelling salesman problem

Week 5:

4. **Backtracking method implementation**

   Bin packing problem implementation

Week 6:

5. **Implement Minimum Spanning Tree algorithm – Prim's and Kruskal's(Greedy methodology)**

   a. Implement MST using Kruskal's or Prims algorithm(half of the students will do Prim's and the rest will do Kruskal's)

Week 7:

6. **Graph traversals using adjacency list and adjacency matrix**

   a. Find connected component in a graph

   b. Perform topological sorting in the graph.

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