

**Govt. of Karnataka, Department of Technical Education**  
**Diploma in Information Science & Engineering**  
**Third Semester**  
**Subject: ANALYSIS AND DESIGN OF ALGORITHM LAB**

Contact Hrs / week: 6

Total hrs: 96

**Graded Exercises**

**Note: 1. Implement the entire program using C only**  
**2. Different Set of inputs can also be given for the execution of programs.**

1. Perform recursive linear search. Hence find the time and space required to search an Element.
2. Sort a given set of elements using Selection sort. Hence find the time and space complexities required to search an element.
3. Create an adjacency matrix for the given graph (use any graph in Fig (a), (b), (c) and (d))
4. Implement DFS to check whether the Roads are connected to different cities or not (use Fig (a) and Fig (c)).

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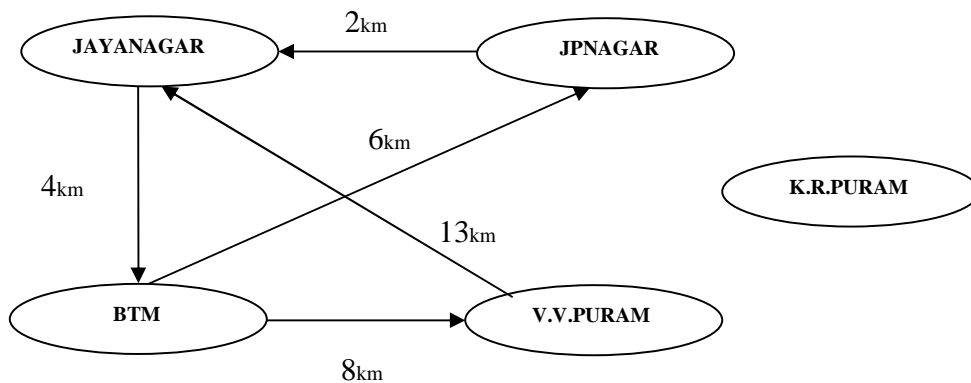


Fig (a)

5. Implement BFS to check whether the Roads are connected to different cities or not (use Fig (a) and fig (c)).
6. Arrange ten students marks of ADA using Merge sort of Divide and conquer Technique.

7. Arrange age of n students by Implementing Quick sort using Divide and conquer Technique.
8. Arrange n students name using Insertion sort.
9. For the following Graph in Fig (b) obtain the topological order in getting dressed by a professor

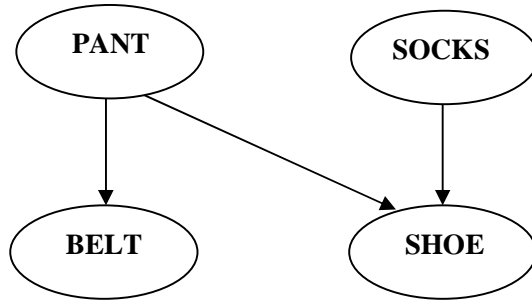


Fig (b)

10. Compute the transitive closure (whether the path exists between each cities or not) for the given directed graph in Fig (c) using Warshall's algorithm.

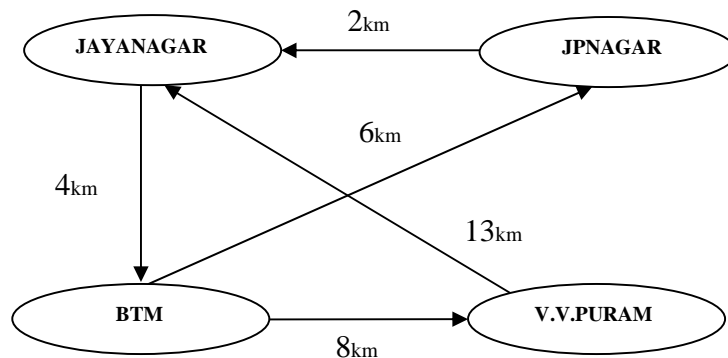


Fig: (c)

11. Find out the shortest path from each area to all the remaining areas in Fig (c) using all pairs shortest path algorithm of Floyd's.

12. A ship can carry up to 50 ton of load. If we have the following items to load with the respective profits, find out the maximum profit we can get using 0/1 knapsack problem solving algorithm of dynamic programming.

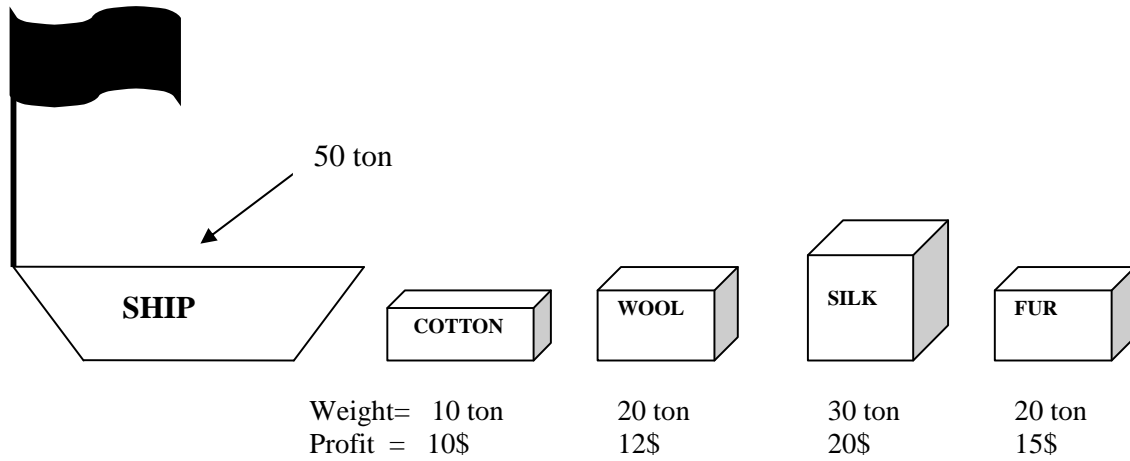


Fig (d)

13. Find minimum cost spanning tree of a given undirected graph in Fig (e) using Prim's algorithm.

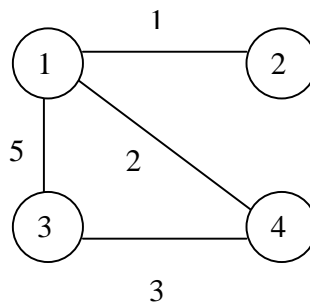


Fig (e)

14. Find minimum cost spanning tree of a given undirected graph in Fig (e) using Kruskal's algorithm.

15. Implement Queen's problem.

**REFERENCE BOOKS:**

1. Introduction to the design & Analysis of Algorithms by Anany Levitin
2. Fundamentals of computer Algorithms by Ellis Horowitz  
Sartaj Sahani Sanguthevar Rajasekaran.
3. Analysis and Design of algorithms by A.M. Padma reddy

**SCHEME OF VALUATION:**

|   |   |              |
|---|---|--------------|
| 1 | Record  | 10           |
| 2 | Writing two programs one each from<br>part A & part B | 15 X 2 = 30  |
| 3 | Entering and Executing one program from part B        | 10 + 20 = 30 |
| 4 | Result / Printout                                     | 10           |
| 5 | Viva-voce   | 20           |
|   | <b>Total Marks</b>                                    | 100          |