Lab Manual

Module-07
Course Title : Sessional based on CSE 2201
Course No. : CSE 2202

Experiment No. 7

Name of the Experiment: Design and Complexity analysis of Dynamic Programming.

Date: 7th Cycle

Algorithms (Dynamic Programming)**:**
- **Multistage Graph**
- **All-pair Shortest Paths**
- **Single-source Shortest Paths**
- **Optimal Binary Search Tree**
- **0/1 Knapsack**
- **The traveling Salesperson Problem**
- **Flow Shop Scheduling**

Multistage Graph:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: Multistage Graph]

All-pair Shortest Paths:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: All-pair Shortest Paths]

Single-source Shortest Paths:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: Single-source Shortest Paths]

Optimal Binary Search Tree:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: •   Optimal Binary Search Tree]

0/1 Knapsack:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: 0/1 Knapsack]

The traveling Salesperson Problem:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: The traveling Salesperson Problem]

Flow Shop Scheduling:
> [Reference: Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithm", Dynamic Programming, Topic: Flow Shop Scheduling]

Task:
1. Find out the complexity of the above algorithms.
2. Code the above algorithm in any language(i.e. C/C++/Java)
3. Find the running time for a different size of dataset.
4. Write down a report on it.

Recommended Exercise:
Programming Exercises of Chapter 5: "Dynamic Programming" of "Fundamentals of Computer Algorithm", Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran.