Department of Computer Science and Engineering,
Anna University, Chennai– 600025
CS6104 – Data Structures and Algorithms (R 2018)
Practical
August – December 2023
Year/Sem/Batch : II/III/ P

Exercise: 09 | **Greedy and Dynamic Programming** | **16 – Nov - 2023**

Observation (5 Marks)

1. Apply a brute force approach to schedule three jobs J1, J2 and J3 with service times as 5,8,12 respectively. The actual service time units are not relevant to the problems. Make all possible job schedules , calculate the total times spent in jobs by the system. Find the optimal schedule (total time). If there are N jobs , what would be the total number of job schedules?

2. Find out the optimal result for the following problem instances using Fractional Knapsack algorithm

   (P1, P2, P3, P4, P5) = (20, 30,40, 32, 55) (W1, W2, W3, W4, W5) = (5, 8, 10 12, 15)

   Maximum Knapsack Capacity = 20

3. Write the applications of greedy and dynamic programming.

4. List down the advantages of greedy and dynamic programming

5. Differentiate greedy with Dynamic Programming

Execution (15 Marks)

6. Implement Fractional Knapsack algorithm and find out optimal result for the following problem instances: $Q1$ (P1, P2, P3, P4, P5, P6, P7) = (15, 5, 20, 8, 7, 20, 6) (W1, W2, W3, W4,W5,W6,W7) = (3, 4, 6, 8, 2, 2, 3) Maximum Knapsack Capacity =18

7. Implement the task scheduling algorithm on your system to minimize the total amount of time spent in the system for the following problem:

Job	Service Time
1	5
2	10
3	7
4	8

8. Implement the chained matrix multiplication and print the optimal parentheses algorithms for the following instance and study the performance of the algorithms on different problem instances.

A1 – 5 x 4

A2 – 4 X 6

A3 – 6 X 2

A4 – 2 x 7