ECSE210L: Design and Analysis of Algorithms

Lab 4 (Week 4: January, 27 - 31, 2020)

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1. Implement and discuss (while showing your codes) of divide and conquer techniques for Lab2 and Lab 3 assignments.

2. Complete the problem 2 of Lab2 assignment.

3. There is sand delivery agency. They need to deliver 'n' tonne (1000Kg) of sand from their location to a customer's location. They have delivery trucks of various sizes i.e. 1 tonne, 5 tonnes, 10 tonnes, and 25 tonnes. partially filled truck will cause wastage of resources. So, if each truck is fully filled then design a greedy algorithm for identifying minimum number of trucks required for the delivery and their sizes.

4. Identify a set of different sizes of trucks where greedy algorithm will not yield the optimal solution. Include truck size of 1 tonne to ensure there is a solution for every value of 'n'.

5. Write an algorithm of size O($n \times k$) complexity to find a solution for k- different size of trucks, assume that out of k-different sizes one size is 1 tonne.

6. suppose that trucks are available in sizes c^0, c^1, c^2, ..., c^k, where c and k are integers, c>1 and $k \geq 1$. Show that greedy algorithm will always yield the optimal solution.