Week 1 and 2:

Algorithms- an Overview:

- Introduction to algorithms

- Role of Algorithms in Computing

- Fundamentals of Algorithmic Problem Solving

Fundamentals of Analysis of Algorithms Efficiency

- Analysis Framework

- Measuring an Input SIze

- Unit of Measuring Runtime

Cormen:

Chapter no 1 (1.1 and 1.2)

Assignment Questions:1.2-2, 1.2-3, 1-1

A. Leviton:

Chapter no 1 (1.1 and 1.2) Reading 1.3 and 1.4 (for your interest)

Chapter no 2 (2.1 till pg 45)

Decrease and Conquer technique with a simple example algorithm:

Insertion Sort Pseudocode and dry run

Proof of Correctness: Loop Invariant

Analyzing algorithms with RAM Model (Best, Average, Worst)

Cormen chapter no 2: 2.1 & 2.2

A. Leviton chapter no 4: 4.1

Divide and Conquer technique with a simple example algorithm:

Merge Sort Pseudocode and dry run

Analyzing algorithms with RAM Model (Best, Average, Worst)

Cormen chapter no 2: 2.3

A. Leviton chapter no 5: 5.1

Practice Questions:

Cormen 2.1-1, 2.1-3, 2.2-2, 2.3-1, 2.3-2

Asymptotic Notations:

Big O, Big Omega, Big Theeta

Cormen: Chapter 3 (3.1, 3.2 defn only)

Anany: Chapter 2 (2.2 till page 55)

Practice Questions:

Cormen:2.2-1, 3.2-2, 3.2-3

Anany: 1,2,3,5

Mathematical Analysis of non-recursive algorithms

Basic Operation Identification

Expressing the loops in summation

Anany chapter no 2: 2.3

Mathematical Analysis of Recursive algorithms

Basic Operation Identification

Expressing the recurrence in terms of basic operation

Anany chapter no 2: 2.4

Solving Recurrences

1.   Substitution Method

2.   Recurrence Tree method

3.   Master Theorem

Cormen chapter no 4: 4.3, 4.4 and 4.5