

**Foundation Exam Review Class Lesson Plan – Week 6 (November 20, 2014)**

**Location: CB1-320 3, 3 – 4 PM**

1) (40 min) Recursion

Did case study – solved the following problem from scratch using two different implementations:

Write a function that takes in a string and prints out all non-empty ascending subsequences in that string. An ascending subsequence of a string  $w[0..n-1]$  is a sorted list  $0 \leq a_1 < a_2 < a_3 < \dots < a_k < n$ , such that  $w[a_1] < w[a_2] < w[a_3] < \dots < w[a_k]$ . For example, given the word “home”, all of the ascending subsequences are “h”, “ho”, “hm”, “o”, “m”, and “e”.

2) (20 min) Order Notation

- a) Visualizing simple steps for each data structure
- b) AVL Trees and Heaps with  $n$  items have height  $O(\lg n)$ .
- c) Binary Search Trees with  $n$  items may have height as big as  $n-1$ .
- d) Stacks and Queues, when implemented efficiently have  $O(1)$  operations.
- e) Iteration Technique for recurrence relations