EECE.3220: Data Structures

Key Questions
Recursion; BSTs (Lectures 29-31)

QUESTIONS

1. Explain recursion and recursive functions.

2. What is a tree? What is a binary tree? What is a binary search tree (BST)?

3. What are the characteristics of a tree and its nodes (different node types; height/depth; etc)

4. Describe how a BST can be efficiently searched.

EXAMPLES

1. Rewrite the iterative binary search algorithm below for an array as a recursive algorithm.
   a. Set *found* = false
   b. Set *first* = 0
   c. Set *last* = *n* - 1
   d. While *first* ≤ *last* and not *found*, do following:
   e.   Calculate *loc* = *(first + last)* / 2
   f.   If *item* < *a[loc]* then
   g.   Set *last* = *loc – 1*   // Search first half
   h.   Else if *item* > *a[loc]* then
   i.   Set *first* = *loc + 1*   // Search second half
   j.   Else
               Set *found* = true   // Item found

2. Describe how a search algorithm for a BST can be written recursively.