

CSE 2017 Data Structures and Lab

Lecture #14: Wrap up

Eun Man Choi

Review for Final Exam

- **Date: 2015. 12. 10(Thr) 1:00~2:30 PM**
Room 6114(New Eng. Bld)
- **Exam will cover Chap 7~10**
- **Question style**
 - Type 1: True/False(12 questions)
 - Type 2: Short answer(5 Questions)
 - Type 3: Coding(4 Questions)
- **Don't remember to answer essay type questions. Try to understand basic concept of each data structure types and study all primitive operations of data structures covered after mid-term exam.**

Chapter 7. Recursion

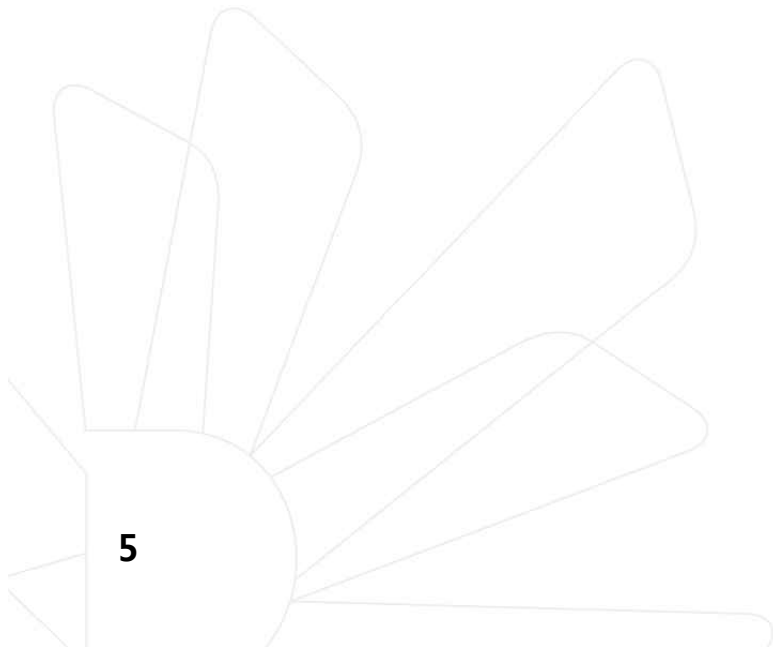
- What is recursion?
- Recursive routines.
 - Base case
 - General case
- Write recursive programs(examples)
- Difference between recursive and iterative program.

Chapter 8. Binary Search Tree

- **Definition and Terminology**
 - Binary tree, Root, Descendant, Subtree, BST, Parent, Level, Ancestor, Child, Height
 - Full binary tree and complete binary tree
- **Characteristics of BST**
- **Tree representation**
 - array, link
- **Traversal methods**
- **Operations(insert, delete, etc) of BST**
- **Big-O efficiency of BST operations**
- **Expression tree**
 - Definition
 - Traversal

Chapter 9. Heap, Priority Queue

- Shape and order properties of a heap
- Heap implementation in array
- Priority queue
 - Enqueue
- Compare implementations of a priority queue using a heap, a linked list
- Reheap down
- Reheap up



Chapter 9. Graph

- **Definition of graph**
 - Directed graph, complete graph, undirected graph, weighted graph, vertex, edge, path, etc
- **Representation of graph**
 - Adjacency matrix
 - Adjacency list
- **DFS/BFS**
- **Spanning tree**
- **Finding shortest-path**

Chapter 10. Sorting and Hashing

- **Sorting algorithm**
 - Selection sort
 - Bubble sort
 - Insertion sort
 - Quick sort
 - Heap sort
 - Merge sort
- **Compare the efficiency of the sorting algorithms in terms of Big-O**
- **Hashing**
 - Hashing functions
 - Linear probing
 - Collision

Next steps after taking Data Structure

- **Program = Class(data+operations) + Class +**
- **System knowledge**
 - Operating system
 - Database management system
 - Computer network
- **Engineering knowledge**
 - Design knowledge
 - Experience of software project
 - Applications
 - Graphics
 - Robotics
 - AI
 - Data mining
 - etc

Engineering Education

- Learning by doing
- Learning by making
- Learning by design
- Learning by coding
- Learning by testing
- Learning by tinkering
- Learning by engineering



After graduation



- **Architecture programmer**
 - More study on computer system inside
 - Advanced system programming
 - Data administration
 - Managing computer network/security
- **Idea programmer**
 - Web programming
 - Embedded programming
 - Mobile programming
 - More research on linking to application(bank, automobile, insurance, factory automation, electronic devices and appliance, etc)

Lack of programmer in all world

