CSSE 230 Day 8

Binary Tree Iterators

Reminders

▸ Exam 1 – Day 1, evening
- ◦ Coverage:
  - • Everything from reading and lectures, Sessions 1–10
  - • Programs through BinaryTrees
  - • Homeworks 1–3
- ◦ Allowed resources:
  - • Written part: One side of one 8.5 x 11 sheet of paper
  - • Programming part:
    - • Textbook
    - • Eclipse (including programs you wrote in your repos)
    - • Course web pages and materials on Moodle
    - • Java API documentation
  - • A previous 230 Exam 1 is available in Moodle

Exam 1 Possible Topics

- Sessions 1-10
  - Growable Arrays
  - Big-Oh, Big-Omega, and Big-Theta
  - Limits and asymptotic behavior
  - MCSS
  - ADT/Collections
  - Binary search
  - Binary trees
  - Binary tree traversals

Agenda

- Binary Tree Lazy Iterators

- BinarySearchTree (BST) insertion

Binary Tree Iterators

What if we want to iterate over the elements in the nodes of the tree one-at-a-time instead of just printing all of them?

Recall the four types of traversals

- What are they?

- How would you make a lazy pre-order iterator? (brainstorm an algorithm now)

- What do you need to add to create the other recursive iterators?

- What about the last iterator?

Very different alternative to a stack

▸ Each node can store pointer to the next node in an in-order traversal

▸ Must update extra info in constant time as tree changes

An upcoming homework set will include programming these "threaded binary trees"

Work time