Lecture 10: Linked Lists

CS 62
Fall 2016
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Piazza

- Six students still not enrolled.
- All important communications to the class will be through Piazza.
  - You are responsible for knowing what has been posted there.

Quiz Friday

- Iterators
- Lists
- Sorts/Big-O

Writing Code

- No complex code ever works first time.
  - If I just fix this last thing ...
- Think about testing before you write the code.
  - Never write more than a method or two without testing it.
- Talk about JUnit in lab next week.

FileIO

- File class:
  - represents a file or directory
  - doesn't have to exist
  - use the File.separator so that it doesn't matter what system we run on.
- Some methods that may be helpful:
  - delete()
  - exists()
  - createNewFile()
  - isFile()
  - isDirectory()
  - listFiles()
  - mkdir()
  - renameTo(...)

More FileIO

- Use the BufferedReader and PrintWriter classes for reading and writing to files.
- Have lots of useful methods
- PrintWriter out =

  ```
          new PrintWriter(new FileWriter(...));
  ```

- BufferedReader in =

  ```
          new BufferedReader(new FileReader(...));
  ```

Exceptions

- Many methods/constructors throw exceptions
  - public String readLine() throws IOException
- Handle exceptions by try-catch construct

  -
    ```
    try {
        ... myFile.readLine() ...
    } catch (IOException ex) {
            code to be executed if exception raised
    }
    ```

Assignment

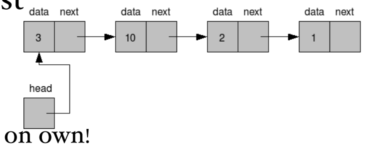
- We provide QuickSort and MergeSort classes
  - class MergeSort<E extends Comparable<E>>
    - E has compareTo method
- WordScanner is an Iterator!
  - Provides strings from file.
  - Sophisticated implementation using Scanner
    - not required to understand

Linked Lists

- Alternate implementation of lists
- Trade-offs in complexity
  - With ArrayList expensive to add at beginning of list
  - Linked lists inexpensive to add early
  - However, slow to access ith element.

Linked List

- Composed of Nodes
  - Think of as snap-lock beads
  - See code in structure5 library
    - From documentation page!
- See code in SinglyLinkedList
  - *Bailey - not std Java!*
  - keep track of head and size
  - Extends AbstractList -- look at on own!
    - Vector also extends AbstractList
- Also see SinglyLinkedListIterator



Linked List Algos

- Constructor
- addFirst, removeFirst
- get(i)
- indexOf(e)
- add(i,o)
- remove(e), remove(i)
- iterator

What is worst-case complexity of each?