Lecture 12: Stacks

CS 62
Fall 2016
Kim Bruce & Peter Mawhorter

You never know when CS will be relevant!

Obama at Google

Weekly Lab

- Lab: JUnit
  - Unit testing with Java. Learn how to generate complete set of test for each method in program.
  - Read 4 items called for in Lab handout!

Weekly Assignment

- Assignment: Compression
  - Need to define new class CurDoublyLinkedList
    - Keeps track of "current" elt.
    - Can be subclass of DoublyLinkedList from Structure5 library.
  - Get up to two points extra credit if turn in design by Thursday midnight.

Reading about Collection Classes

- Oracle’s Java Tutorials
  - Trail: Collections
    - https://docs.oracle.com/javase/tutorial/collections/index.html
    - Up to date info on Java implementations

Stack

- Interface Stack<E> {
  - void push(E value)
  - E pop()
  - E peek()
- Example: Trays in cafeteria

- Last In - First Out (LIFO)
  - No changes to middle of list ever!

Stack Applications

- Run-time stack:
  - See sum program
- Backtracking
  - Solving Maze
- Evaluating expression in postfix form:
  - (52 - ((5 + 7) * 4) ⇒ 52 5 7 + 4 * - ⇒ 4
- Tools to parse programs

Stack Implementations

- ArrayList:
  - Which end should be head?
  - How complex for push, pop, peek?
- SinglyLinkedList: *Why not doubly-linked?*
  - Which end should be head?
  - How complex for push, pop, peek?
- Space differences?
  - What if there are several stacks?
- java.util.Stack based on Vector - don’t use!
  - ArrayDeque is better choice (*more details later)*