Syllabus Information

* No textbook needed (optional: Data structures and algorithm analysis in java: Mark allen Weiss)
* Piazza discussion forum
* Grades:
  + Homework (65%):
    - Projects(50) with required partner
    - Individual written (15)
  + Exams
    - Midterm (15)
    - Final (20)

CSE 143 review

* Client Classes
  + Executable code; main method
* object classes
  + Contains state and behavior information; cannot be run on its own

Abstract Data Types: ADT

* A definition for expected operations and behavior of a data structure
  + Ex of data structures; lists, sets, maps, etcc
  + List
    - Ordered sequence of elements
    - Has a size, and 0 based index
    - Elements can be added anywhere
* Interfaces: list of methods that are promised to be implemented
  + i.e. if public class ant implements critter, a critter may be a set of methods like eat(), move(), reproduce(), die()…
* JAVA Collections ADTs
  + A collection is something that groups certain types of data together…
  + Lists, Stacks, Queues, Maps, Sets
  + Lists
    - Linked lists
    - Array lists
  + Queues
    - Normal
    - Priority queue
  + Map/set
    - Hash
    - Tree

Wed June 20th

* Try to choose appropriate data structure based on what your needs are
  + Space efficiency?
  + Time efficiency?
  + What functionality do you need?
* O(N) notation
  + How much does the runtime change as the size of the input you are dealing with change?
    - i.e. if you are traversing an array, the time it takes to do so grows linearly with the size of the array; this would be considered O(N)
    - if you are traversing an N x N 2D array (matrix), then the traversal time grows with O(N^2)
* Stack
  + Last in first out
  + Can only access top element
  + Push, pop, peek, size, isEmpty
    - All operations are O(1)
  + Implement our own!
    - Use a linked list or use an array!
    - Fields: front (start of linked list), back, and size (# elements in list)
* Generic Types
  + Allows you to write classes generically for objects
  + Public class Stack<T>