AP Computer Science

COLLECTIONS
Abstract Data Types (Collections)

- Abstract = Lacking Detail
- Way of storing data plus the methods for manipulating the data
- Helps organize data
- Different collections are suited for different problem situations
ABOUT COLLECTIONS

- Collections can be...
  - Homogeneous (contains same types)
  - Heterogeneous (contains mixed types)
- Primitives must be wrapped before placed in a collection
- Objects must be cast when retrieved from a collection
EXAMPLES OF COLLECTIONS

- Arrays
- Strings
- Stacks
- Lists
- Queues
- Binary Trees
- Graphs
- Heaps
- Maps
- Sets
- Bags
MAIN TYPES OF COLLECTIONS

- **Linear**
  - Each data item has a unique predecessor and a unique successor

- **Hierarchical**
  - Each data item has one predecessor (parent), but many successors (children)

- **Graph**
  - Each data item has many predecessors and many successors

- **Unordered**
  - Data items have no predecessors and no successors
THE LIST INTERFACE

- Lists are a Linear Collection
- Three main implementations
  - ArrayList
  - LinkedList
  - Vector
- List Interface: Pages 445 and 446
MORE ABOUT LISTS

- Lists can be...
  - Singly-Linked
  - Doubly-Linked
  - Circularly-Linked

- How would you implement...
  - Add?
  - Remove?
ASSIGNMENTS

- **Written Assignment:**
  - Page 450 #2 and #3

- **Lab Assignment:**
  - Page 464 Projects 13-1 and 13-2
  - Key in the TaskListView Class
  - Create the Task Class
    - 2 private variables and accessor methods
  - Create the TaskListModel Class
    - Implement all methods on Page 452-453