Changes of Office Hours

- Monday. 5-6:30 p.m.
- Tuesday. 5-6:30 p.m.
- Wednesday. 3-4:30 p.m.
Arrays

- An array is a container object that holds a fixed number of values of a single type.

- The length of an array is established when the array is created. After creation, its length is fixed.
Data Structure from the lectures

- Bags
  - Can contain duplicate elements

- Queues
  - FIFO

- Stacks
  - LIFO

- Linked lists

Not in Java API

Interface in Java API as Queue

Class in Java API as Stack

Implementation of List

Class in Java API as LinkedList

Implementation of List
Java Collection

- **Collection Interface & Class (as Collections)**

- **Set (not Bag) Interface**
  - Cannot contain duplicate elements

- **Queue Interface**
  - FIFO

- **List Interface & Class (as List)**
  - Can contain duplicate elements, ordered
Implementation of Set

- *Set*
  - [http://docs.oracle.com/javase/7/docs/api/java/util/Set.html](http://docs.oracle.com/javase/7/docs/api/java/util/Set.html)

- *HashSet<E>*
  - [http://docs.oracle.com/javase/7/docs/api/java/util/HashSet.html](http://docs.oracle.com/javase/7/docs/api/java/util/HashSet.html)
Implementation of Queue

- Queue
  - [http://docs.oracle.com/javase/7/docs/api/java/util/Queue.html](http://docs.oracle.com/javase/7/docs/api/java/util/Queue.html)

- PriorityQueue<E>
  - [http://docs.oracle.com/javase/7/docs/api/java/util/PriorityQueue.html](http://docs.oracle.com/javase/7/docs/api/java/util/PriorityQueue.html)
Implementation of List

- List
  - [http://docs.oracle.com/javase/7/docs/api/java/util/List.html](http://docs.oracle.com/javase/7/docs/api/java/util/List.html)

- ArrayList
- LinkedList
- Stack
- Vector
Iterator

- Iterator is an interface
  - [http://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html](http://docs.oracle.com/javase/7/docs/api/java/util/Iterator.html)

- Methods of Iterator
  - hasNext()
  - next()
  - remove()
Practice

- Pruning duplicate elements from a collection that has duplicate elements

```
7 4 4 3 5 2 3 7
```

```
7 4 4 3 5 2 3 7
```
Practice

- Use Hashset to prune

- Use iterator(), addAll in Hashset

- Assume we have 1 million elements in an ArrayList or Queue, and we do not know how many elements have duplicates. We should use another Hashset to help us prune all duplicates in our ArrayList or Queue. Use Iterator to traverse the Hashset.