48. What is Iterator and difference between for each loop?

- Iterator works with ArrayList and not array.
- It will help us Iterate through the elements.
- Difference is with iterator you can make changes(remove item) to the list while iterating.
- within for each loop we cannot make changes to our list

49. Java Collection Framework

Two types of Collection (Be careful not to mix them up)

- **java.util.Collection** - interface from Set and List extend (not implement)
  - **Set** *(Unique things)* - DOES NOT ALLOW DUPLICATES. Classes that Implement Set;
    - **HashSet** → Use when you don't want any duplicates and you don't care about order when you iterate through
      - Unordered and Unsorted
    - **LinkedHashSet** → Ordered version of HashSet and Use over HashSet when you care about iteration order
    - **SortedSet**
    - **TreeSet** → Elements will be in ascending order, according to the natural order of the elements
      - Can also customize constructor to implement your own rules of the natural order
  - **List** *(list of things)* - cares about the index. Classes that implement List;
    - **LinkedList** → Ordered by index position and elements are doubly-linked to one another
      - It is a good choice for implementing stack and queue
      - Iterates more slowly than ArrayList but fast insertion and deletion
    - **Vector** → Same as ArrayList BUT vector methods are synchronized (thread-safe)
    - **ArrayList** → Fast iteration and Fast random access and ordered(by index)
      - Also unsorted (but can invoke Collections.sort() to sort it)
- **java.util.Collections** - a class that holds static utility methods for use with collections; Includes add, remove, contains, size, and iterator, etc.
  - **Map** *(things with unique ID)* → Important: none of the Map-related classes and interfaces extend form Collection. The implementation classes of Map are thought of "collections", not Collection. Classes that implement Map;
    - **Hashtable**
      - Same as HashMap BUT HashTable methods are synchronized (REMEMBER. ONLY METHODS ARE SYNCHRONIZED, NOT CLASSES OR VARIABLES)
      - Hashtable won't let you have anything NULL(NO NULLS AT ALL)
    - **LinkedHashMap**
      - Maintains insertion order(or optionally, access order)
      - Slower than HashMap for adding/removing elements but FASTER ITERATION
    - **HashMap** → Unsorted and Unordered & Allows one null KEY and multiple null values in a collection
      - KeySet()
      - Map.keySet() - returns a set of Keys
      - Map.keySet().size - return # of keys
    - **SortedMap** → TreeMap
- The implementation classes of Set,List, and Map can NEVER be both sorted but unordered, can be all other combinations.

50. How to convert float to String?

```
float f = Float.parseFloat("25");
String s = Float.toString(25.0f);
```