ArrayList Hierarchy

Learning Objective

Apply inheritance to ArrayLists to implement subclasses with a specific behavior.

Agenda

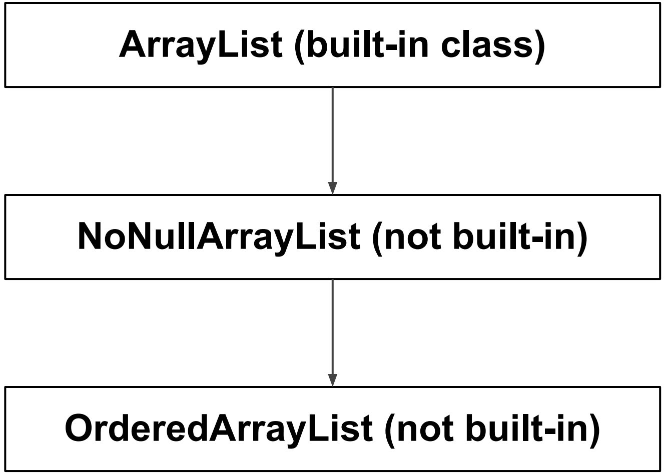
- Do Now activity
- Mini Lesson:
  - Explain ArrayList Hierarchy
  - What classes do we need?
  - What constructors do we need?
  - What methods should be overridden?
- Practice:
  - Implement ArrayList Hierarchy in Java (2 days)

Do Now

Discuss with a partner:

- About a way to prevent you from adding a null item to an ArrayList.
- How would you do to keep your ArrayList sorted everytime you add a new item?

ArrayList Hierarchy



ArrayList (built-in class)

NoNullArrayList (not built-in)

OrderedArrayList (not built-in)

NoNullArrayList Characteristics

Considering that NoNullArrayList **IS-A** ArrayList:

- What constructors should NoNullArrayList have?
- Which basic methods should be overridden to prevent having null elements in the list?
- What strategy would you use to prevent having null elements?

Tips to implement a NoNullArrayList

- NoNullArrayList **IS-A** ArrayList (NoNullArrayList inherits from ArrayList).
- ArrayList uses any type of data. You must get that behavior in your NoNullArrayList by declaring you class like this:

  ```
  public class NoNullArrayList<T> extends ArrayList<T>{

  }
  ```

  <T> indicates the generic type that will be used.

- Use different test cases to try your code.

OrderedArrayList Characteristics

OrderedArrayList maintains the elements sorted in a list when they are added.

Considering that OrderedArrayList **IS-A** NoNullArrayList:

- What constructors should OrderedArrayList have?
- Which basic methods should be overridden to have all elements sorted in order?
- How would you override the method set?

Tips to implement an OrderedArrayList

- OrderedArrayList **IS-A** NoNullArrayList (OrderedArrayList inherits from NoNullArrayList).
- Your code should allow T to use the compareTo() method which compares an object with another, and returns a numerical result based on the comparison. If the result is negative, this object sorts less than the other; if 0, the two are equal, and if positive, this object sorts greater than the other (Example: o1.compareTo(o2))

```
public class OrderedArrayList<T extends Comparable<T>> extends
NoNullArrayList<T>{

}
```

Coding Time!!!