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E6: Iterator

Use the Iterator Pattern:

1. Create a class called **InClassExercise**, and then, in its main method, create an **ArrayList** called **stringArrayList**. Add the following five strings to **stringArrayList**: **"one", "two", "three", "four", "five".** Then, use a for loop and the index of **stringArrayList** to print all these five strings out to the console.
2. For **stringArrayList** above, can you use an iterator to traverse the five strings inside, without using the index? Yes, you can use an iterator to traverse the five strings inside without using indices.
3. If change **stringArrayList** into a **TreeSet**, how do you traverse the five strings use an iterator? You would traverse the TreeSet the same way you traversed the ArrayList using an iterator.

Output:

```
ArrayList Regular For Loop:
one two three four five
----------------------
ArrayList Iterator:
one two three four five
----------------------
TreeSet Iterator:
apple banana cherry date elderberry
```

Implement an Iterator for StringArray:

4. Create a class called **StringArray** that is able to store a number of String objects. Create an instance variable, String[] values, (internal data storage) of **StringArray** to store all the strings.

5. Create a constructor for **StringArray**, which is able to build an object of **StringArray** using the parameter.

```
public StringArray(String[] values)
```

6. Make the class **StringArray** implements **Iterable** interface. So that it can generate iterators. What function do you need to implement this interface? What should be returned by that function? I need to implement the iterator() function which returns an Interator<String> object

7. Create an inner class called **ArrayIterator** in **StringArray**. This is our first iterator. Create an int variable called **current** inside **ArrayIterator.** it works as an index for our iterator.

8. Make **ArrayIterator** implements **Iterator** interface, so that it becomes an iterator. What functions do you need to implement this interface? Implement these functions. You need to implement hasNext() which returns a Boolean and next() which returns a string.

9. Go back to your **StringArray** class, what should be returned by the **iterator()** function? It returns a new object of the ArrayIterator() class which inherits the Iterator<String> class.

10. So far, an iterator is done. Create a main method, and build an object of **StringArray**, add five strings in step 1 to it. Traverse and print them out.

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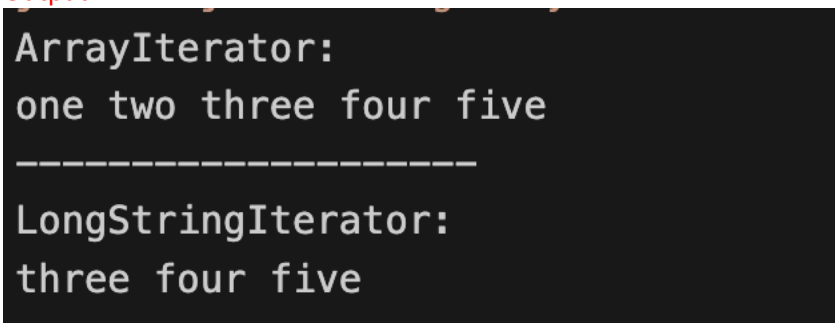
11. Create another iterator (inner class) **LongStringIterator.** This new iterator traverses only String elements equal or longer than 4 characters.

Output:



What to turn in: similar as E5.