Lab23: ArrayList of Objects

Goal: Create an ArrayList class that behaves like an ArrayList<Object>

Notes:
-Do not use ArrayLists, you are creating your own!
-You do not have to worry about the capacity.

Abstraction:
ArrayList objects will be represented by Object[]'s. If the ArrayList is empty, the Object[] will be null. "Resize" the arrays when appropriate.

Part 1: Create a class called ArrayList with 1 empty constructor, and a private instance variable called objectList.

Part 2: Do not create getters/setters.

Part 3: Create a size() method. Make sure this works for size 0, 1, 2, 3.

Part 4: Create an add() method that takes 1 object, and adds it to the end of the objectList. Yes, you have to create a new array and copy all old values. Just return true.

public boolean add(Object obj)

Part 5: Create an overloaded add() method that takes 2 arguments. The index to insert the object into, and the object to insert. add() should push back all elements at and after the given index.

public void add(int index, Object obj)

Add this statement at the top of the method:

```
assert (index==0) && (objectList==null) || objectList != null && index<=objectList.length && index>=0: "Error: add()"
```

Try to figure out what this asserts.

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Part 6: Create a get() and remove() method.

```
public Object get(int index);
public Object remove(int index);
```

Part 7: Create a toString() method. Reminder, the String should look like this: "[a, b, c]"

Test your code! (Test code coming soon)

Part 8: Create a class called Dictionary. Dictionary objects will have 2 instance variables.

```
ArrayList words;
ArrayList defs;
```

Each word in the ArrayList words corresponds to an entry in the ArrayList defs at the same index that defines the word.

```
Ex,     words = ["salubrious", "urgent", "inconsistent"]
        defs = ["promoting health", "requiring immediate attention", "lacking agreement"]
```

Dictionary objects do not come with words and definitions!

Part 9: Create an add() method that adds a word and corresponding definition.

```
public void add(String word, String def);
```

Part 10: Create a size() method that returns the number of entries in the dictionary.

```
public int size();
```

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Part 11: Create a randomFlashCard() method that prints a random word, and 4 random definitions from within the dictionary object labelled A,B,C,D. One of the definitions should be correct. Allow the user to guess, then tell them if they are right/wrong along with the correct answer. The right answer should be distributed randomly between A,B,C,D.

Part 12: In Main class, create a static method called fillDictionary() that takes a Dictionary representing the Dictionary, a String[] representing words, and a String[] representing definitions, and fill the Dictionary with the words/definitions.

```
public static void fillDictionary(Dictionary d, String[] words, String[] defs);
```

Part 13: In Main.main(), create a French Dictionary called dictionaire with the following words:

Le taureau	The bull
La vache	The cow
La tortue	The turtle
Le canard	The duck
Le cochon	The pig
La chèvre	The goat
Le poulet	The chicken
Une poule	A hen
Le lapin	The rabbit
Le mouton	The sheep
La brebis	The ewe