CISC275 Exercise Fall 2019, Iterators

NOTE: As you do this exercise, focus on **understanding** every piece of code you write. Copying code examples without understanding leads to ugly code and bad exam grades.

NOTE2: Today's exercise is disposable. Make everything public and do not write any methods you don't absolutely need (but still use meaningful names).

1. Write a Dog class (a dog has a name). Write a toString() method for this class.

2. Create a Collection (how?) of dogs and put three dogs in it (Fido, Spot, Lucy).

3. Print the whole Collection without using an explicit iterator, loop, or recursion.

4. Using a for-each loop (also called an enhanced for-loop, but not a standard for loop), traverse the Collection, and only print if the dog's name is Spot.

5. Create an Iterator over the dogs. Write a for loop over your Iterator. *Try* each of the following, and comment each one out after you try it. Note the effects/exceptions in your comments. Hint: don't do this in Eclipse.

   - Inside the for loop, if the dog's name is Spot, add a new dog to the Collection inside the loop.
   - Inside the for loop, if the dog's name is Spot, add a new dog to the Iterator inside the loop.
   - Inside the for loop, if the dog's name is Spot, remove Spot from the Collection inside the loop.
   - Inside the for loop, if the dog's name is Spot, remove Spot from the Iterator inside the loop.

   Think carefully: why do some things not work? Is that how you would implement the language?

6. Comment the following code, explaining what it does. Replace "here" and "there" with meaningful strings. Try running it (easiest in a shell) and see if you are correct.

```
import java.util.*;

public class C {
    public static void main(String[] args) {
        Set<String> s = new HashSet<String>();
        for (String a : args)
            if (!s.add(a))
                System.out.println("here: " + a);

        System.out.println(s.size() + " there: " + s);
    }
}
```

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