Set 09 Study Questions

1. Define the terms mutable and immutable.

2. Are String objects mutable?

3. Are Integer objects mutable? (If you_re not sure, inspect the online API documentation for the Integer class and find out!)

4. True/False _ Aliasing can lead to problems if the object is mutable.

5. True/False _ Aliasing can lead to problems if the object is immutable.

6. Suppose you are passing (or returning) an array of primitives to/from a method. Is it safe to make a reference copy only?

7. Suppose you are passing (or returning) an array of references to immutable objects to/from a method. Is it safe to make a reference copy only? Is it safe to make a shallow copy?

8. Suppose you are passing or returning an array of references to mutable objects to/from a method. Is it safe to make a reference copy only? Is it safe to make a shallow copy?

9. How many `ints` are created by the statement: `int[] a = new int[5];`

10. How many Strings are created by the statement: `String[] a = new String[5];`
    (Hint: The answer to this question and the previous question are different!)

11. Are the elements of an array of primitives automatically initialized? If so, to what values?

12. Are the elements of an array of references to objects initialized? If so, to what values?

13. Draw the memory diagram for each of the following code fragments:
    ```
    a.   int[] a = new int[4];
    b.   String[] b = new String[4];
         for (int i = 0; i < b.length; i++)
            b[i] = _value _ + i;
    ```

14. Write a class that has an instance variable which is an array of `Cat` objects, called `kitties`. Write a method that returns a reference copy of `kitties`. Write a method that returns a shallow copy of `kitties`. Write a method that returns a deep copy of `kitties`.