



## 2 Static Methods and Variables

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```
1 public class Cat {
2     public String name;
3     public static String noise;
4
5     public Cat(String name, String noise) {
6         this.name = name;
7         this.noise = noise;
8     }
9
10    public void play() {
11        System.out.println(noise + " I'm " + name + " the cat!");
12    }
13
14    public static void anger() {
15        noise = noise.toUpperCase();
16    }
17    public static void calm() {
18        noise = noise.toLowerCase();
19    }
20 }
```

Write what will happen after each call of `play()` in the following method.

```
1     public static void main(String[] args) {
2         Cat a = new Cat("Cream", "Meow!");
3         Cat b = new Cat("Tubbs", "Nyan!");
4         a.play();
5         b.play();
6         Cat.anger();
7         a.calm();
8         a.play();
9         b.play();
10    }
```

### 3 Practice with Linked Lists

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Draw a box and pointer diagram to represent the `StringLists` after each statement. A `StringList` is similar to an `IntList`. It has two instance variables, `String head` and `StringList tail`.

```
1      StringList L = new StringList("eat", null);
2      L = new StringList("shouldn't", L);
3      L = new StringList("you", L);
4      L = new StringList("sometimes", L);
5      StringList M = L.tail;
6      StringList R = new StringList("many", null);
7      R = new StringList("potatoes", R);
8      R.tail.tail = R;
9      M.tail.tail.tail = R.tail;
10     L.tail.tail = L.tail.tail.tail;
11     L = M.tail;
```

## 4 Bonus Problems: Squaring a List

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Write the following methods to destructively and non-destructively square a linked list. Destructively squaring means modifying the items in the `IntList` passed as an argument. Non-destructively means all values in the original list are unaffected by the function.

```
/** Destructively squares each element of the given IntList L.
 * Don't use 'new'; modify the original IntList.
 * Should be written iteratively. */
    public static IntList SquareDestructive(IntList L) {

}

/** Non-destructively squares each element of the given IntList L.
 * Don't modify the given IntList.
 * Should be written recursively*/
    public static IntList SquareNonDestructive(IntList L) {

}

}
```

Even more bonus problems: Write `SquareDestructive` recursively. Write `SquareNonDestructive` iteratively.