In-Lab Demo - Sep. 11

Helper Methods

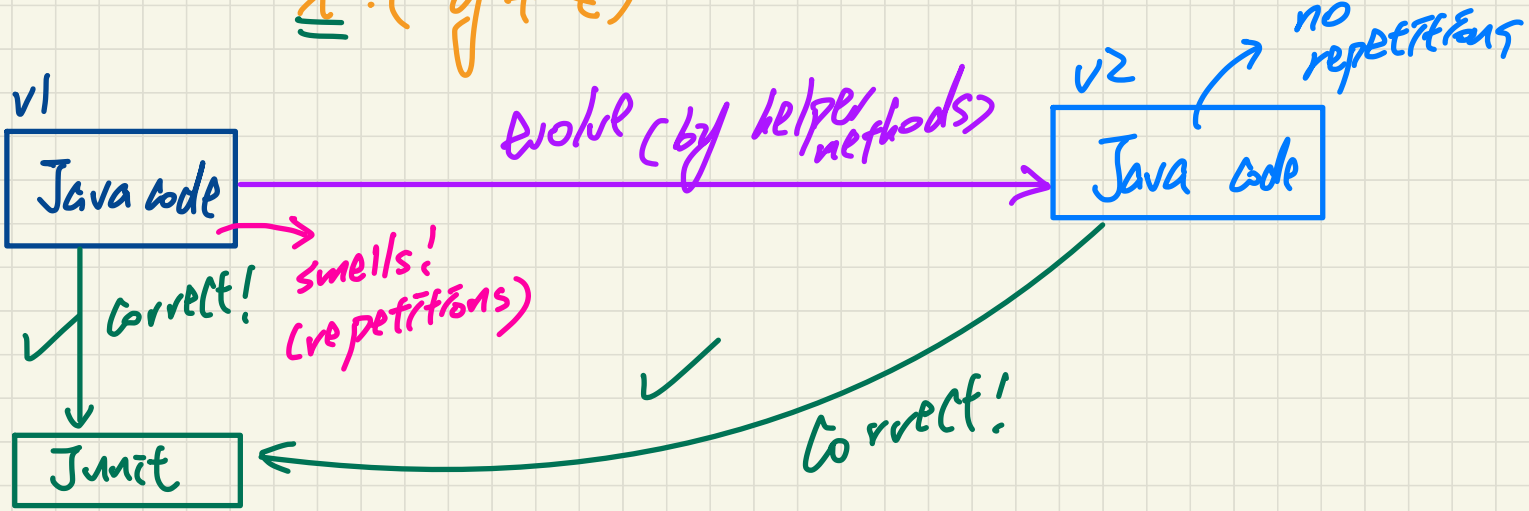
Code Smell
Refactoring
Breakpoints & Debugger

Refactoring

$$x \cdot y + x \cdot z$$

(refactor factor out x

$$x \cdot (y + z)$$



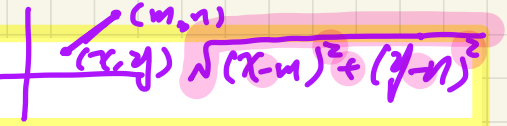
Point: without a Helper Method

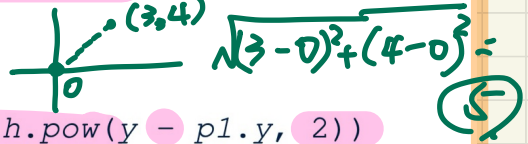
```
class Point { /* code smells:repetitions! */
  double x; double y;

  double getDistanceFromOrigin() {
    return Math.sqrt(Math.pow(this.x - 0, 2) + Math.pow(this.y - 0, 2));

  double getDistancesTo(Point p1, Point p2) {
    return
      Math.sqrt(Math.pow(this.x - p1.x, 2) + Math.pow(y - p1.y, 2))
      +
      Math.sqrt(Math.pow(this.x - p2.x, 2) + Math.pow(y - p2.y, 2)); }

  double getTriDistances(Point p1, Point p2) {
    return
      Math.sqrt(Math.pow(this.x - p1.x, 2) + Math.pow(y - p1.y, 2))
      +
      Math.sqrt(Math.pow(this.x - p2.x, 2) + Math.pow(y - p2.y, 2))
      +
      Math.sqrt(Math.pow(p1.x - p2.x, 2) + Math.pow(p1.y - p2.y, 2));
    }
}
```





0.0001

assertEquals(actual, expected, ε)

↓

expected - ε ≤ actual ≤ expected + ε

Point: with a Helper Method

```
public class Point { /* Code Smell Eliminated */
  private double x; private double y;
  double getDistanceFrom(double otherX, double otherY) {
    return Math.sqrt(Math.pow(ohterX - this.x, 2) +
           Math.pow(otherY - this.y, 2));
  }
  double getDistanceFromOrigin() {
    return this.getDistanceFrom(0, 0);
  }
  double getDistancesTo(Point p1, Point p2) {
    return this.getDistanceFrom(p1.x, p1.y) +
           this.getDistanceFrom(p2.x, p2.y);
  }
  double getTriDistances(Point p1, Point p2) {
    return this.getDistanceFrom(p1.x, p1.y) +
           this.getDistanceFrom(p2.x, p2.y) +
           p1.getDistanceFrom(p2.x, p2.y)
  }
}
```