Defensive programming

Two general ways to avoid painful debugging:
Make bugs impossible by design
Localize bugs to a small part of the program

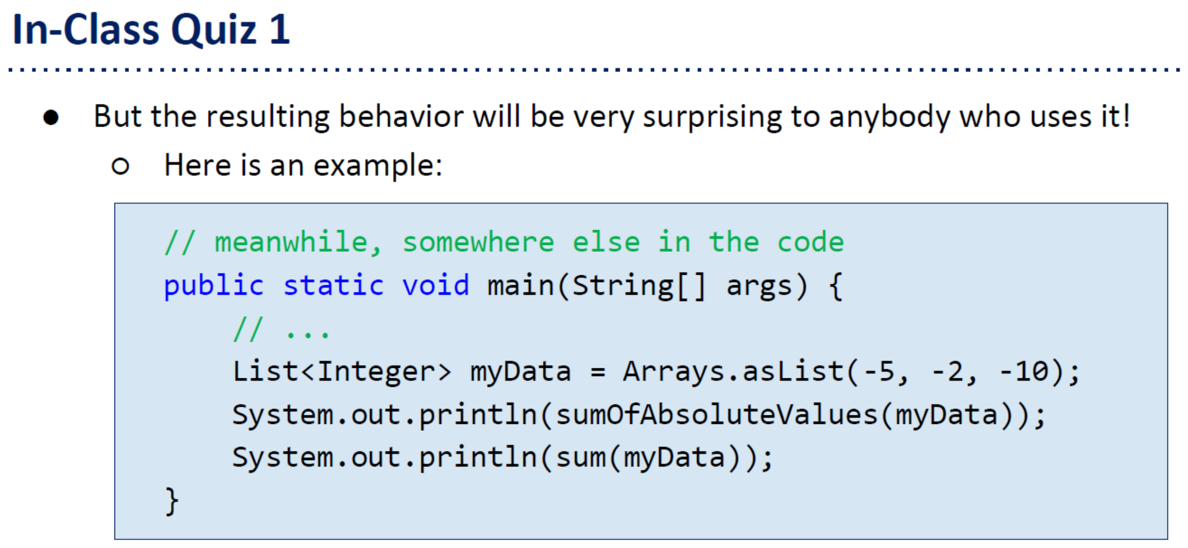
Assertions

This approach abstracts away from what exactly happens when the assertion fails.
○ he failed assert might exit, might record an event in a log file, r might even email a report to a maintainer

assert (x >= 0) : "x is " + x;
If x == 1 , then this assertion fails with the error message: x is 1.

assert is differ with JUnit:

The assert statement should be used in implementation code for defensive checks inside the implementation.
JUnit assert...() methods should be used in JUnit tests to check the result of a test.



In-Class Quiz 1

- But the resulting behavior will be very surprising to anybody who uses it!
  - Here is an example:

```
// meanwhile, somewhere else in the code
public static void main(String[] args) {
    // ...
    List<Integer> myData = Arrays.asList(-5, -2, -10);
    System.out.println(sumOfAbsoluteValues(myData));
    System.out.println(sum(myData));
}
```

- What will this code print?

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- What is the output of `dropCourseA` on input `["a100", "a200", "a300"]` ?

```java
public static void dropCourseA(ArrayList<String> subjects) {
    MyIterator iter = new MyIterator(subjects);
    while (iter.hasNext()) {
        String subject = iter.next();
        if (subject.startsWith("a")) {
            subjects.remove(subject);
        }
    }
}
```

[a200]