Testing
Coding versus Testing
Testing in Practice
Testing Your Own Code
Types of Testing

- **Unit Tests**
  - Test individual methods to make sure they work correctly.

- **Integration Tests**
  - Test that different methods, when combined together, work correctly.

- **End-to-End Tests**
  - Test the entire piece of software as a unit to see what happens.
Unit Tests
General Testing Tip #1

Assume the code to test is a black box of lies!
General Testing Tip #2

Design different test cases to cover different expected results.
General Testing Tip #3

Make sure your test cases cover a representative sample of the inputs.
General Testing Tip #4

Make your test cases structurally different to avoid bias.
General Testing Tip #5

Test edge cases: extreme cases often break methods!
General Testing Tip #6

Testing rarely shows the *absence* of bugs. It only shows the *presence* of bugs.
Once You Find a Bug
Time-Out for Announcements!
Assignment 4

- Assignment 4 is due in a week (next Wednesday at 3:15PM).

- **Recommendation:** Implement the first two steps by Friday.
  - These are a bit tricky – start them early!
  - Stop by the LaIR with questions!

- Review session this Thursday from 5:30PM – 6:30PM in Hewlett 200.
A Reminder: Honor Code
Midterm Grading

• We'll grade the midterm this Saturday.
• Graded midterms should be returned on Monday.
• SCPD students: we'll try to get exams sent back to you ASAP.
Back to CS106A!
Just for Fun: Testing Techniques
Fuzz Testing

• Try running the program/method on randomly-generated inputs.

• Surprisingly effective at smoking out bugs in complex code with lots of interactions.

• Challenge: how do you know whether you've found a bug or not?