

Unit Testing with Python

Emily Bache

<http://coding-is-like-cooking.info>

emily@bacheconsulting.com



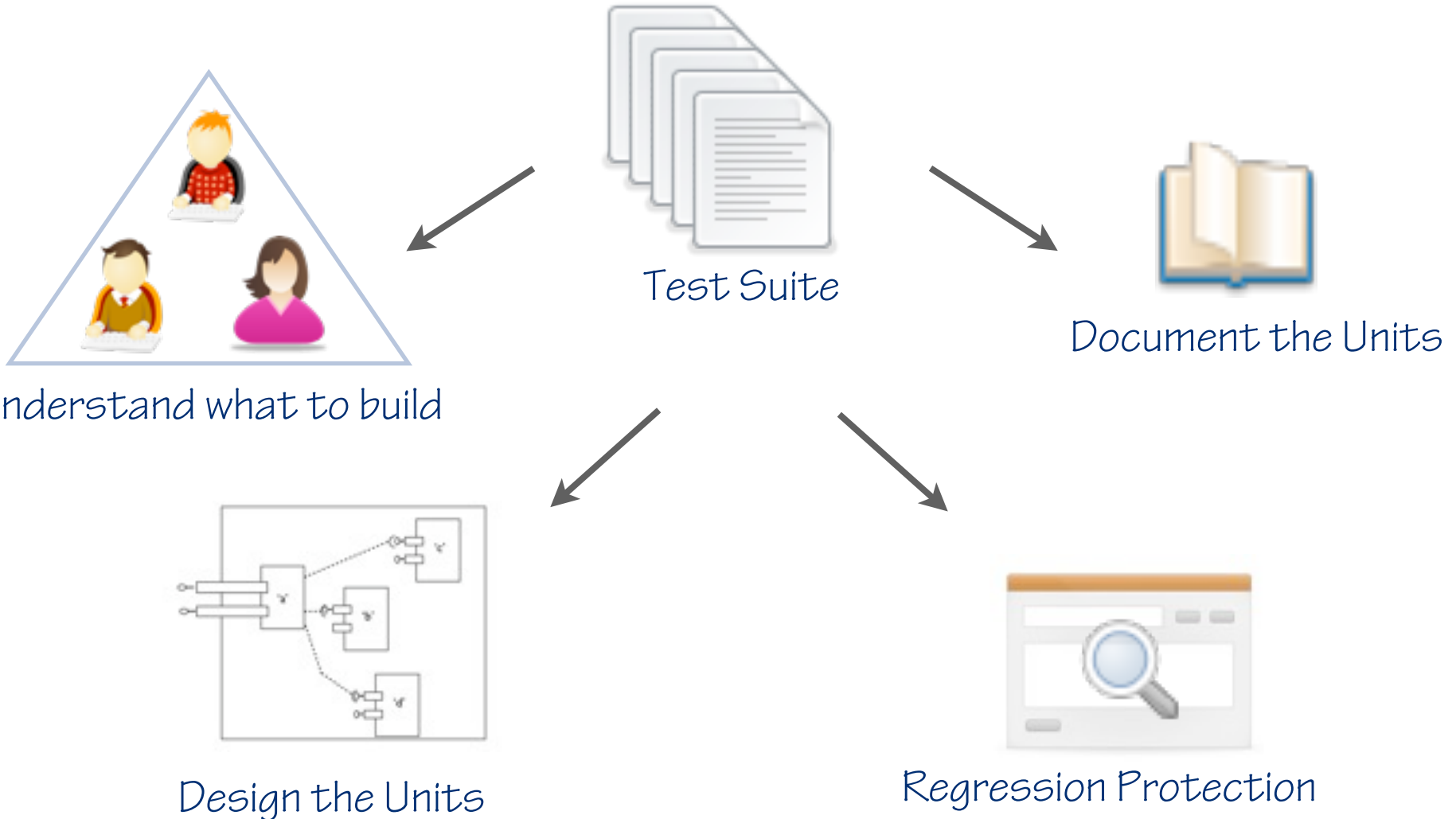
pluralsight 
hardcore developer training

Module Overview

- What is unit testing for?
- Unit testing in your personal development process.
 - Test First
 - Test Last
 - Test Driven
- Unit testing in the wider Development Process



What is Unit Testing For?



Understanding



Understand what to build

- **Collaborate with people in other roles to understand what's needed**
 - Business Analyst, Product Owner
 - Tester
 - Interaction Designer
 - Lead Developer

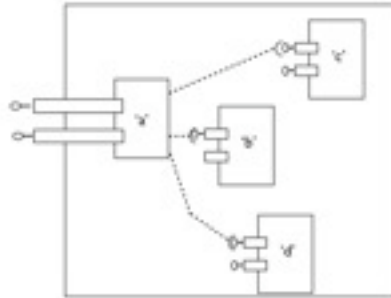
Documenting



Document the Units

- **“Executable Specification”**
 - Tests document the behaviour of the code
 - How the unit is intended to be used

Design



Design the Units

- **Decompose the problem into units that are independently testable**
 - loose coupling
- **Design the Interface separately from doing the Implementation**

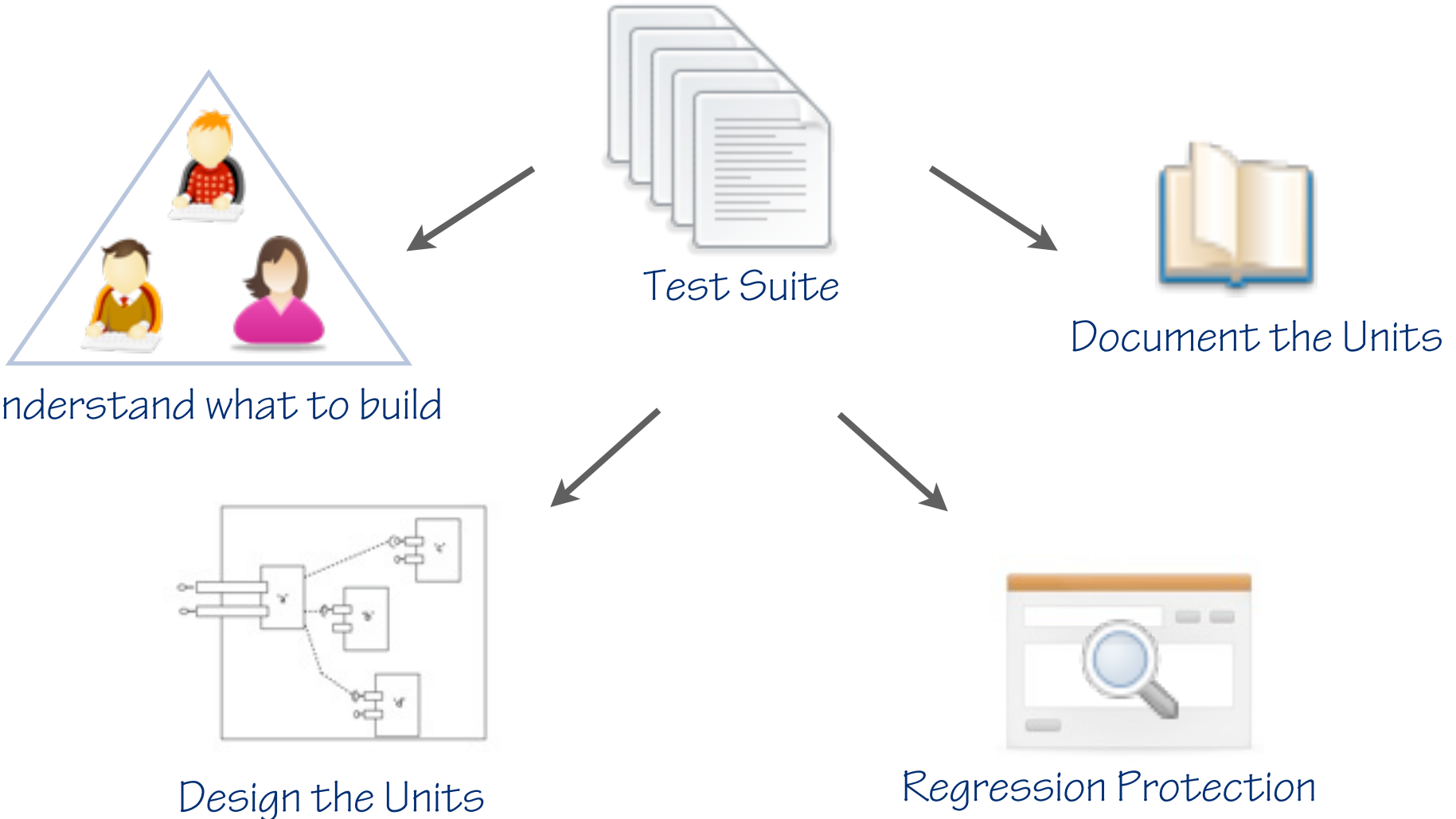
Regression Protection



Regression Protection

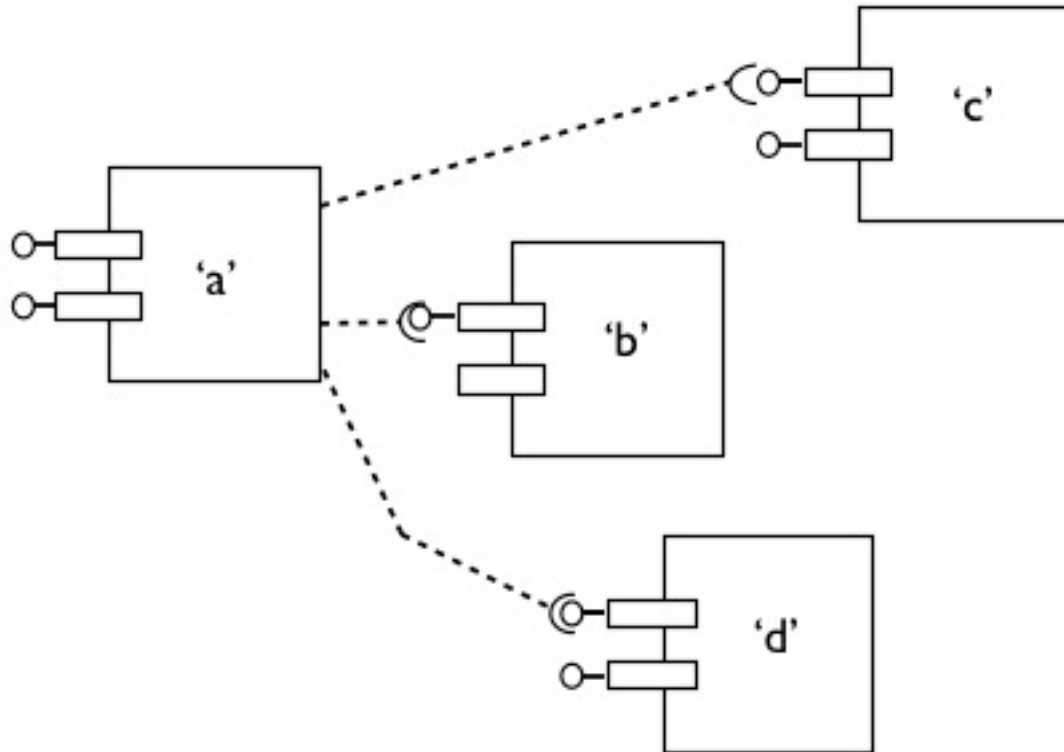
- **Regression - something worked before and doesn't any more**
 - A Unit test should fail & point out which unit failed and why

What is Unit Testing For?

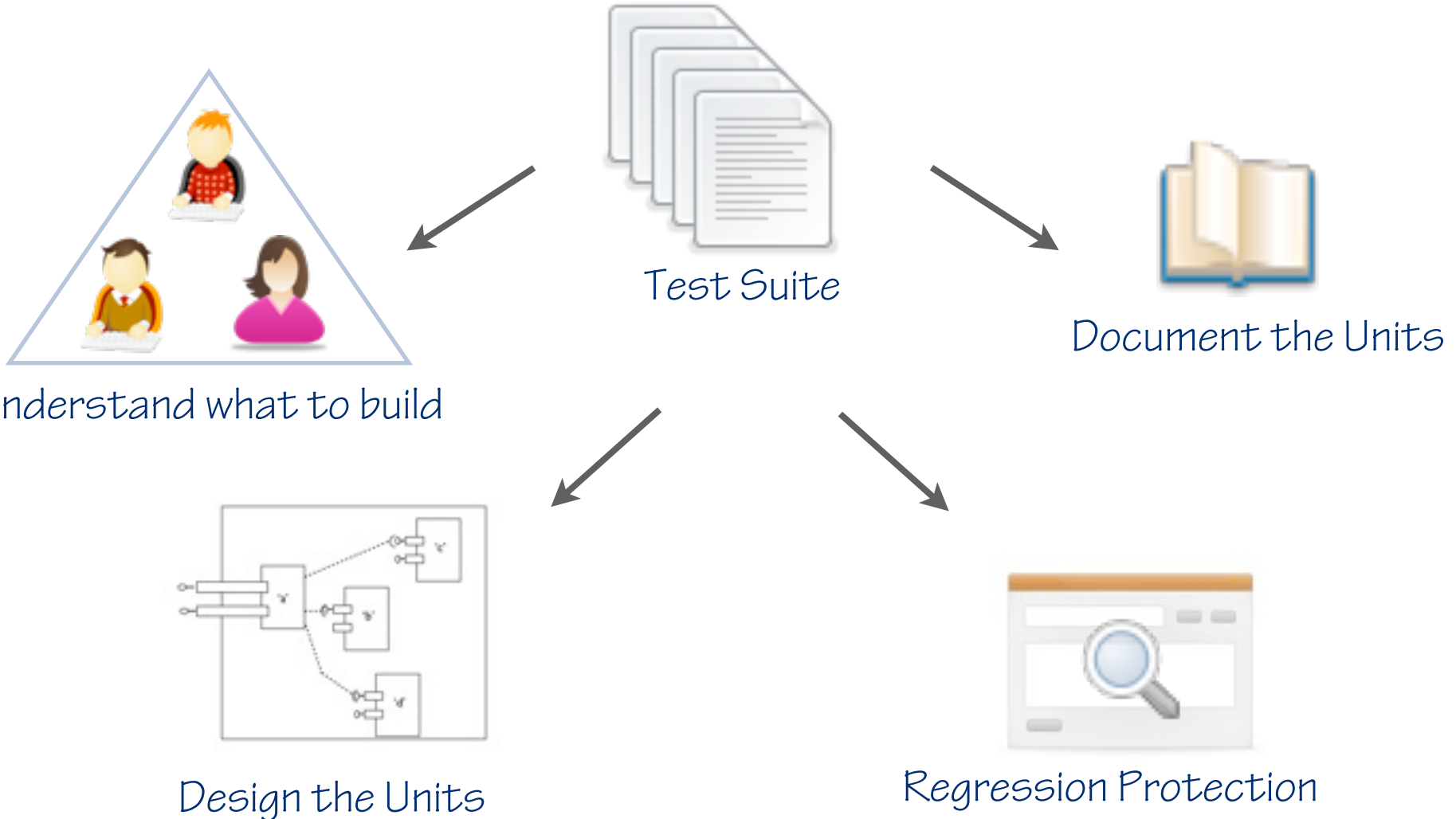


Limitations of Unit Testing

- Testing can't find all the errors
- Unit testing won't find integration errors



Test First, Test Last, Test Driven



Your personal Development Process

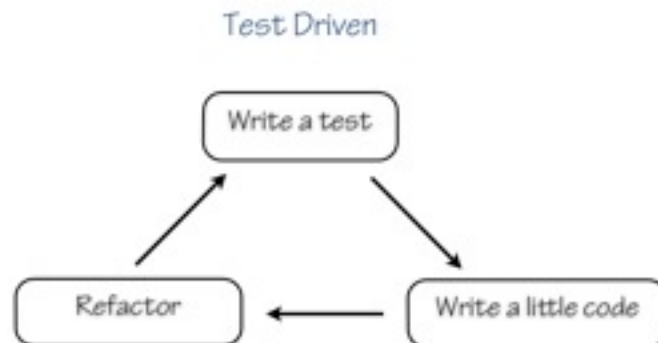
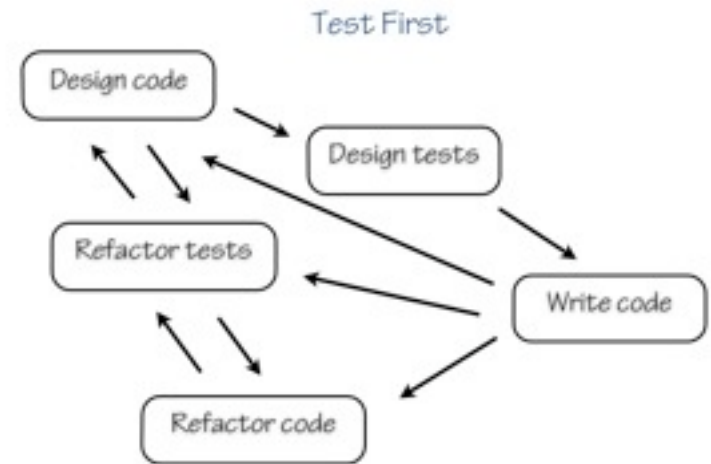
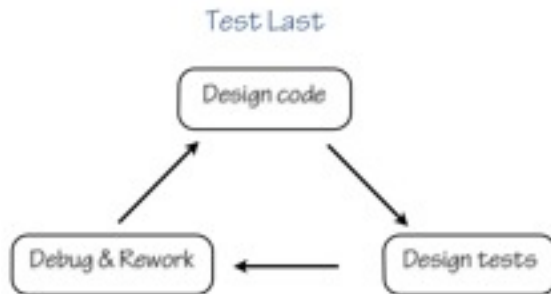


Production Code



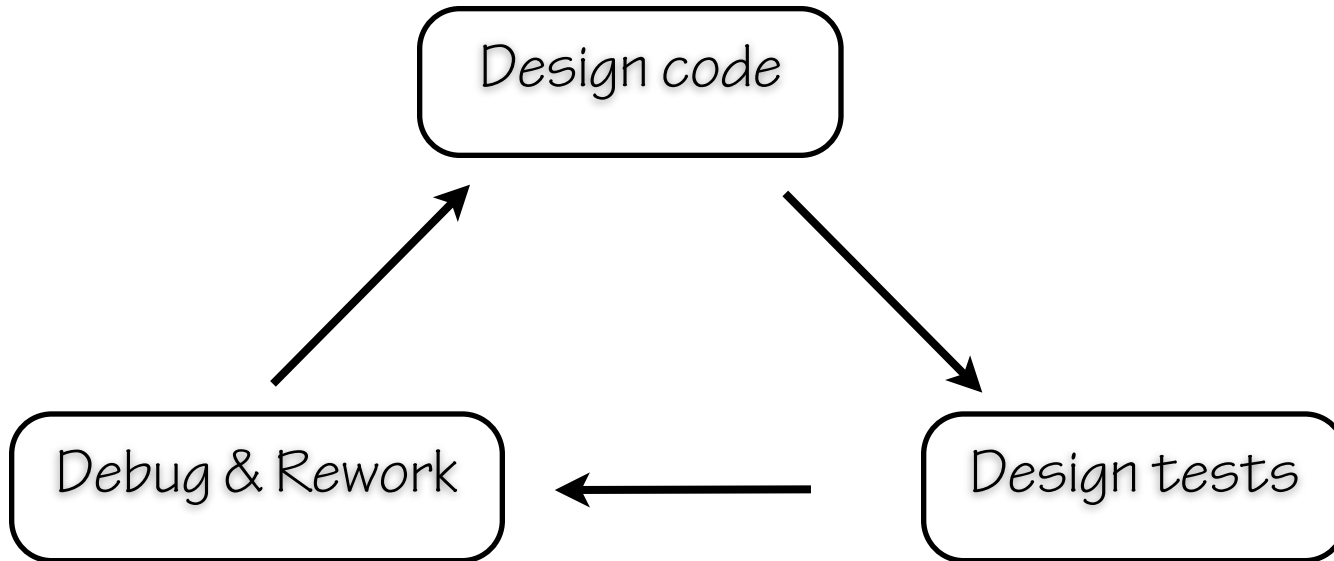
Test Suite

Test First, Test Last, Test Driven



Test Last

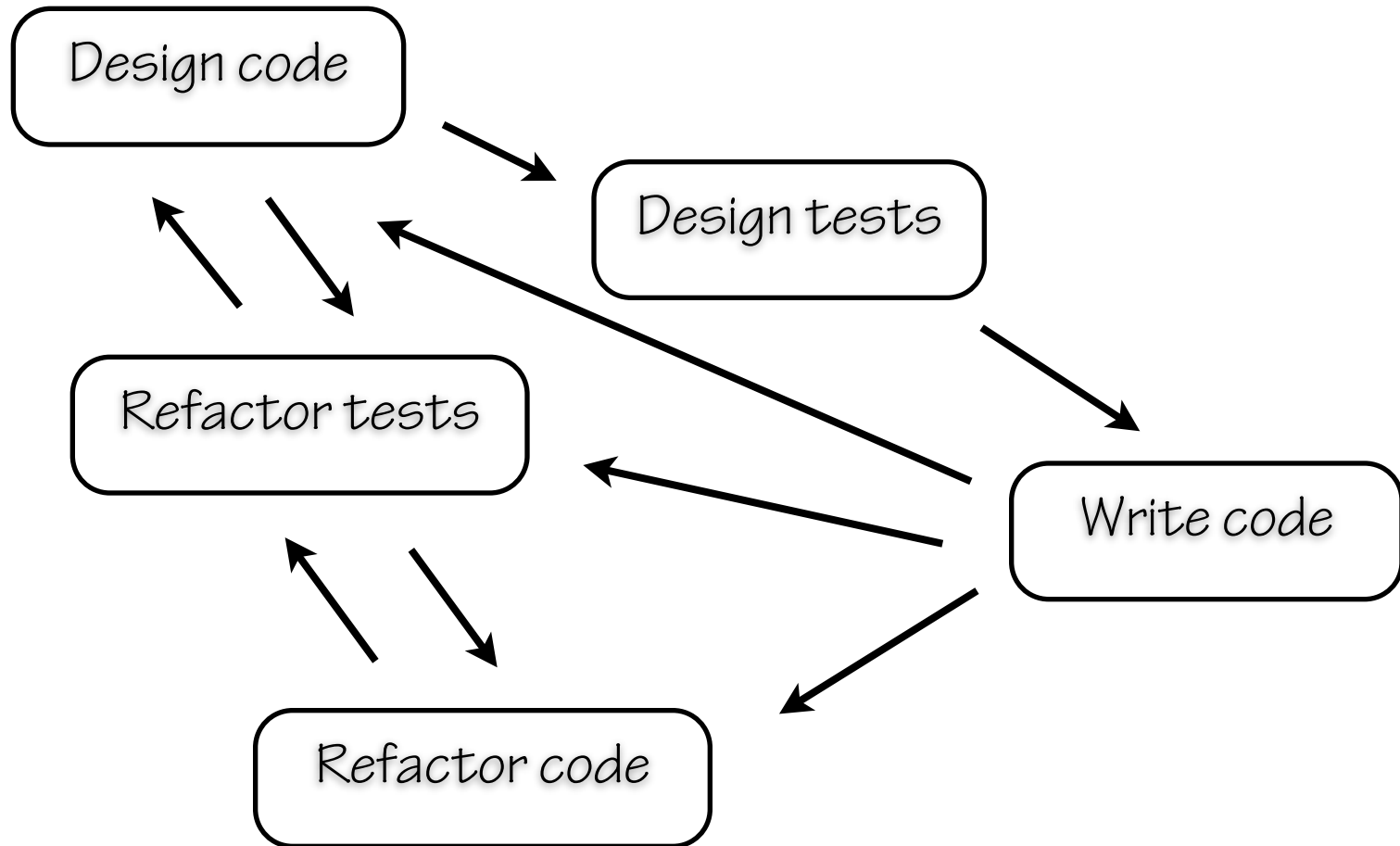
Test Last



- Risk: Discover testability problems and bugs late in the process
- Risk: You'll rush or skip designing the tests

Test First

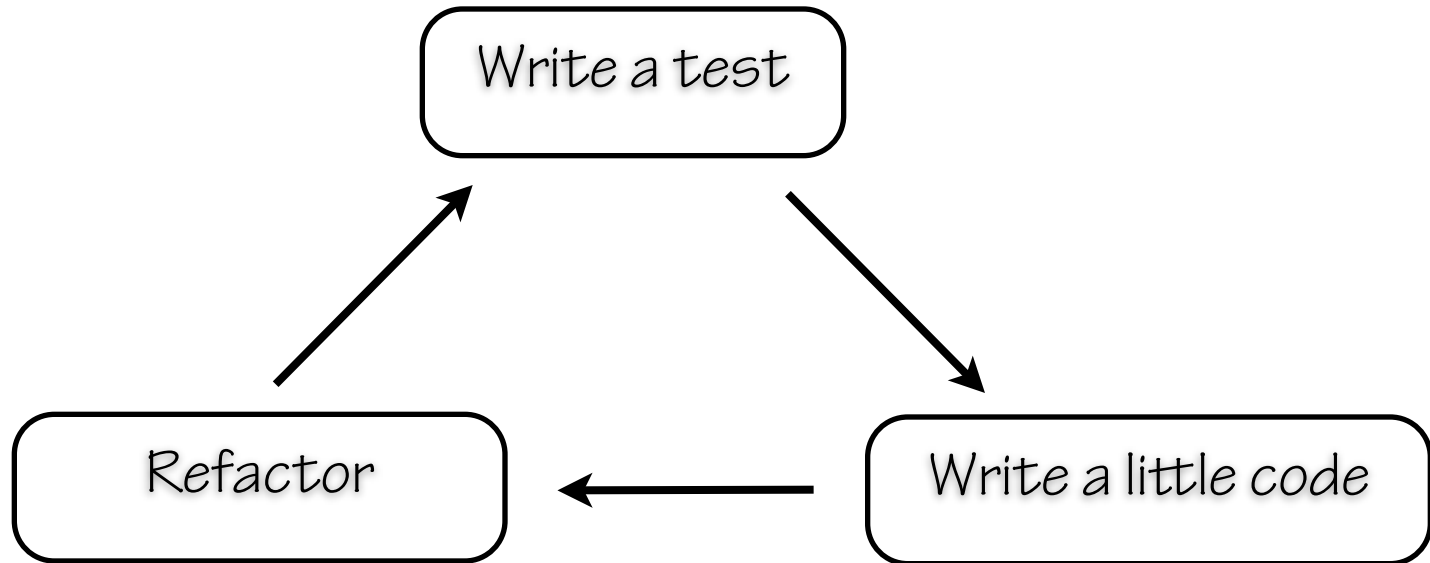
Test First



- Risk: Rework

Test Driven

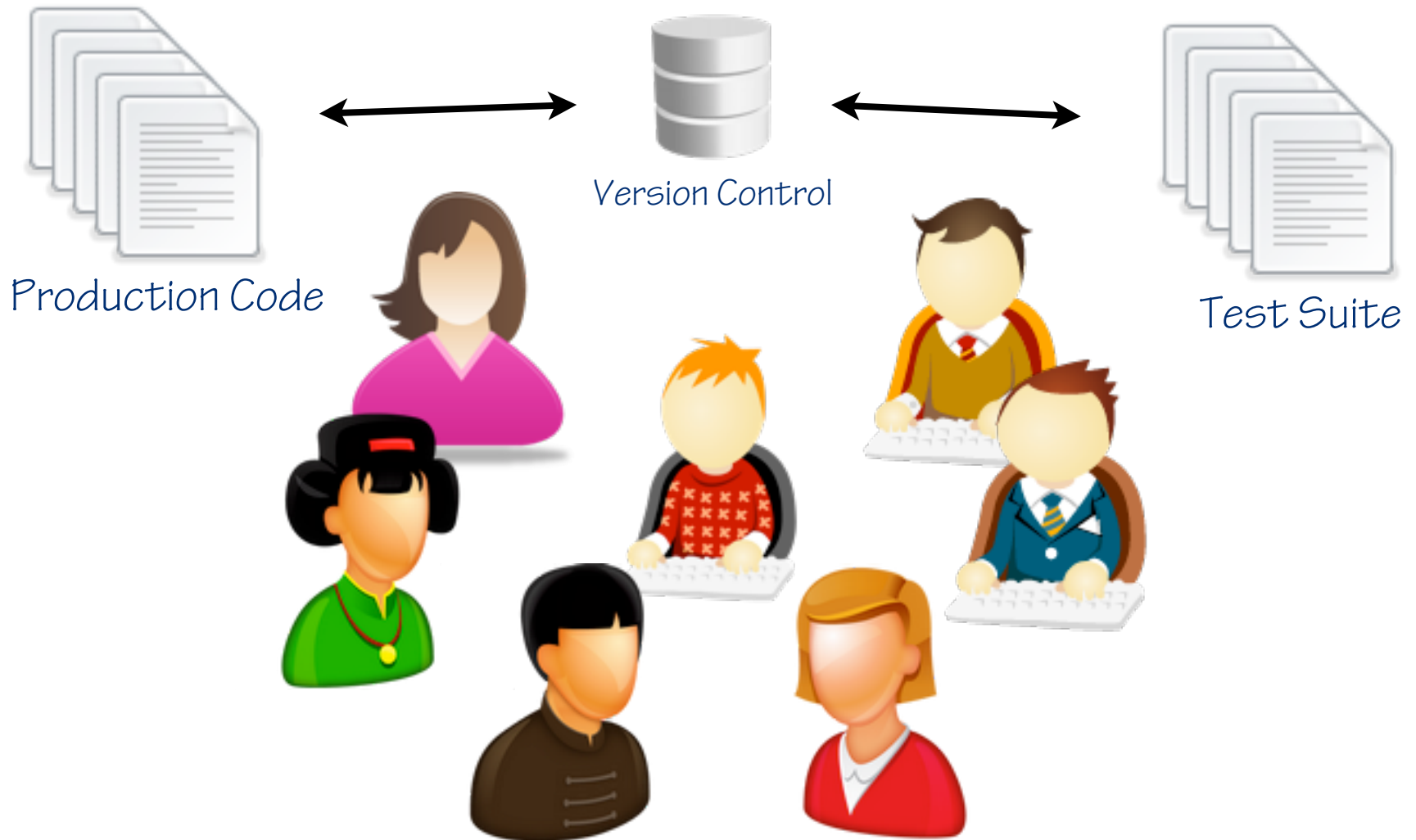
Test Driven



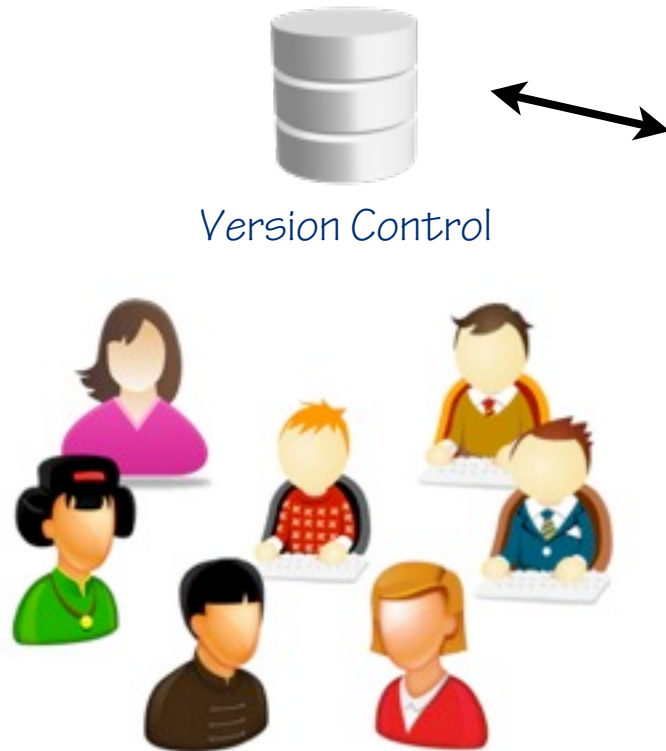
Unit testing in the wider Development Process



Version Control



Work from Known Good



```
$ python3 -m pytest
```

```
=====
platform darwin -- Python 3.3.2 -- pytes
collected 9 items
```

```
test_patient.py .....
test_prescription.py .
```

```
===== 9
$ █
```

Unexpected Failures



Version Control



```
$ python3 -m pytest
===== test session starts =====
platform darwin -- Python 3.3.2 -- pytest-2.3.5
collected 9 items

test_patient.py .....F
test_prescription.py F

===== FAILURES =====
_____ TestPatient.test_clash_overlapping_today

self = <test_patient.TestPatient object at 0x1014a5650>

    def test_clash_overlapping_today(self):
        patient = Patient(prescriptions=[Prescription("Codeine", dispense_date=datetime.date(2013, 9, 26),
        days_supply=3),
                                         Prescription("Prozac", dispense_date=datetime.date(2013, 9, 26),
        days_supply=3)])
        > assert patient.clash(["Codeine", "Prozac"]) == {days_ago(days=2)}
E       assert set([datetime.date(2013, 9, 26)]) == set([datetime.date(2013, 9, 26)])
E       Extra items in the left set:
E       datetime.date(2013, 9, 26)

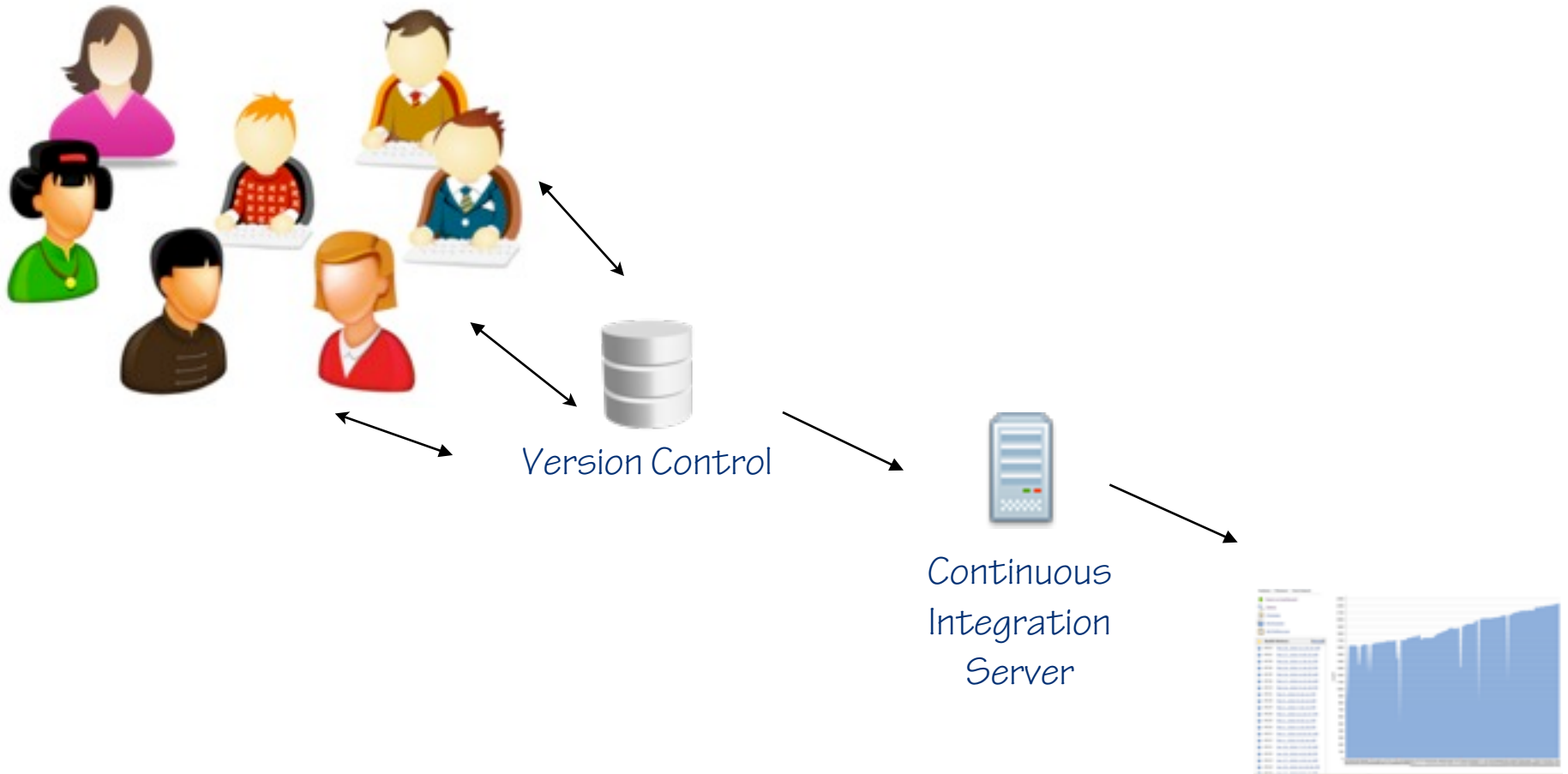
test_patient.py:47: AssertionError
_____ TestPrescription.test_days_taken_excludes_future_dates

self = <test_prescription.TestPrescription object at 0x1014ab310>

    def test_days_taken_excludes_future_dates(self):
        prescription = Prescription("Codeine", dispense_date = days_ago(2))
        > assert prescription.days_taken() == [days_ago(2), days_ago(1)]
E       assert [datetime.date(2013, 9, 27)] == [datetime.date(2013, 9, 26), datetime.date(2013, 9, 27)]
E       Left contains more items, first extra item: datetime.date(2013, 9, 27)

test_prescription.py:12: AssertionError
===== 2 failed, 7 passed in 0.29 seconds =====
```

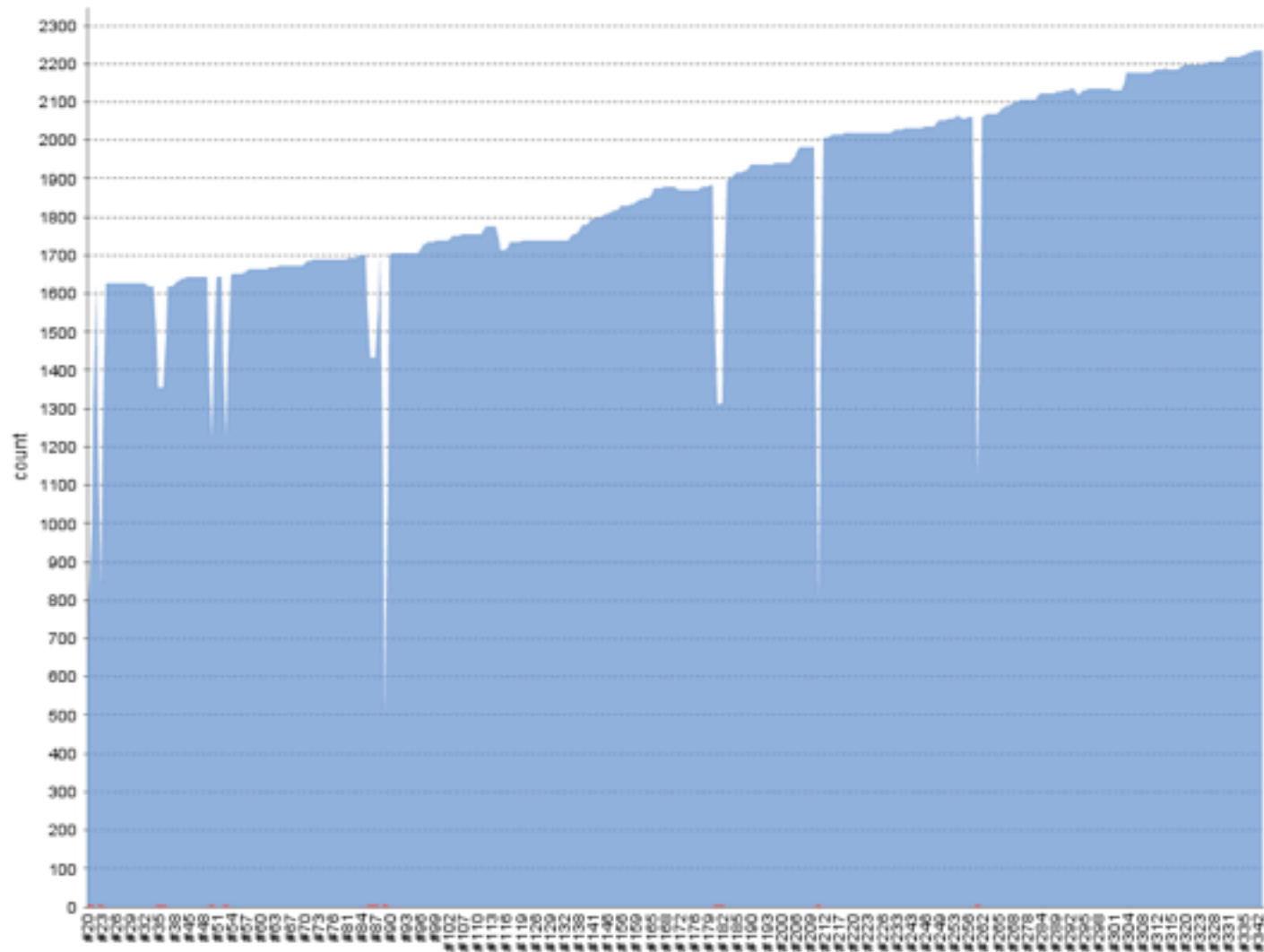
Continuous Integration



- [Back to Dashboard](#)
- [Status](#)
- [Changes](#)
- [Workspace](#)
- [Git Polling Log](#)

Build History
[\(trend\)](#)

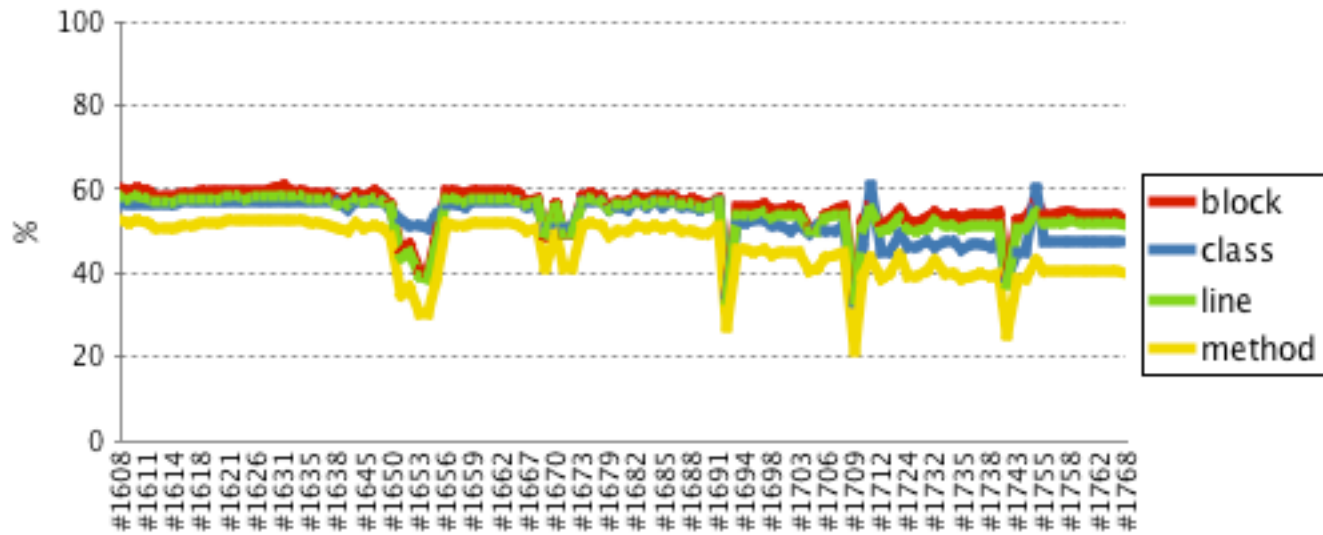
#343	Feb 28, 2010 11:20:24 AM
#342	Feb 27, 2010 9:45:25 AM
#338	Feb 26, 2010 1:36:31 PM
#336	Feb 24, 2010 3:34:25 PM
#335	Feb 24, 2010 6:00:55 AM
#334	Feb 17, 2010 6:23:36 AM
#333	Feb 16, 2010 5:26:38 PM
#331	Feb 9, 2010 5:02:22 PM
#330	Feb 5, 2010 8:24:10 AM
#329	Feb 3, 2010 7:02:33 PM
#328	Feb 3, 2010 12:10:37 PM
#325	Feb 2, 2010 8:02:11 PM
#324	Feb 1, 2010 1:02:58 PM
#323	Feb 1, 2010 10:02:02 AM
#322	Feb 1, 2010 9:02:46 AM
#321	Jan 30, 2010 7:37:25 AM
#320	Jan 28, 2010 4:02:08 PM
#319	Jan 27, 2010 1:02:12 AM
#318	Jan 25, 2010 10:28:06 PM
#315	Jan 17, 2010 5:01:22 PM



See also Martin Fowler's article:

<http://www.martinfowler.com/articles/continuousIntegration.html>

Coverage metrics



Module Review

- What is unit testing for?
- Test First, Test Last, Test Driven
- Unit testing in the wider Development Process

