

Unit Testing: Why and When



Emily Bache
TECHNICAL AGILE COACH
@emilybache coding-is-like-cooking.info

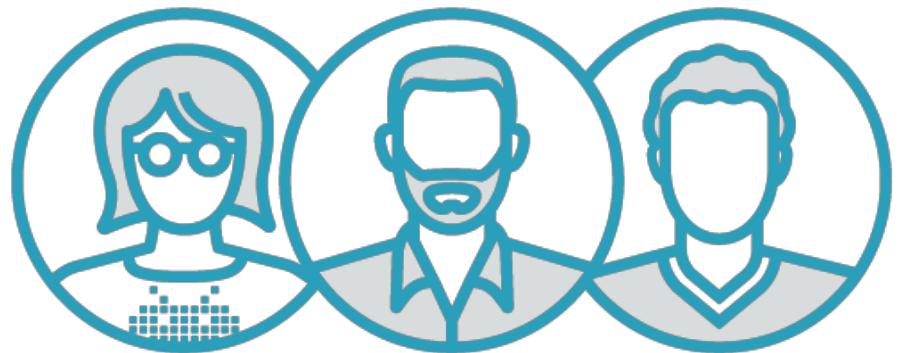
Summary

What Is Unit Testing for?

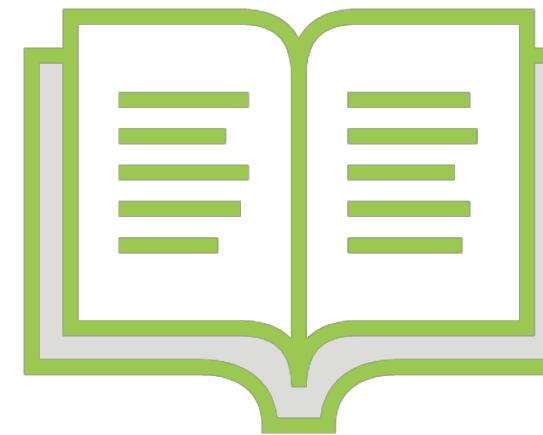
Test First, Test Last, Test Driven

Unit Testing in the Development Process

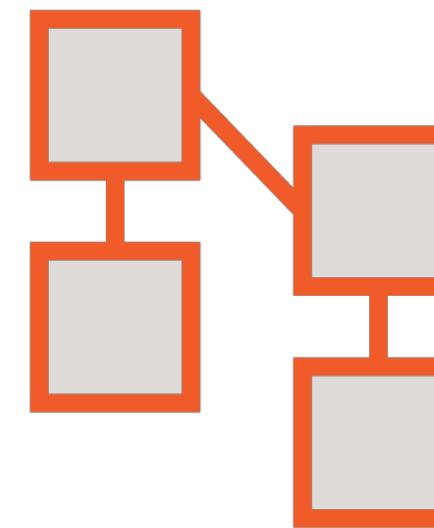
What Is Unit Testing For?



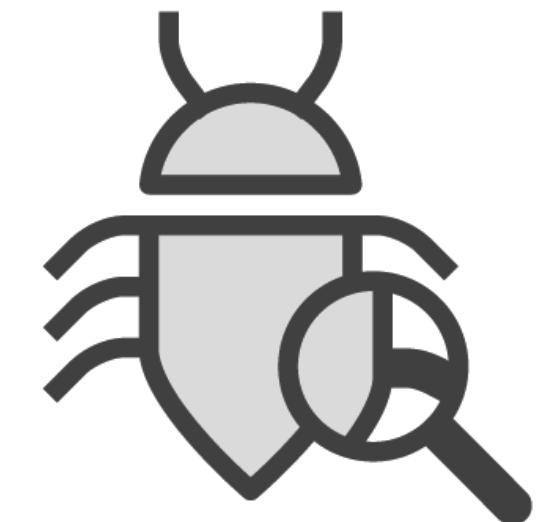
**Understand what
to build**



**Document the
units**



Design the units



**Regression
protection**

Understand what to build

Collaborate with people:

Business Analyst

Tester

Designer

Architect

End-user



```
def test_performance_find_seats_when_seats_are_available():
    performance = Performance("Hamlet", ["A6"])
    seats = performance.reserve_seats(1)
    assert seats == ["A6"]

def test_performance_find_seats_fails_when_not_enough_available():
    performance = Performance("Hamlet", ["A6", "A5"])
    seats = performance.reserve_seats(15)
    assert seats == []
```

Understanding & Documenting

Demonstrate business rules

What is the API, examples of how to use it

Documenting the Units



Specify behaviour of the unit under test

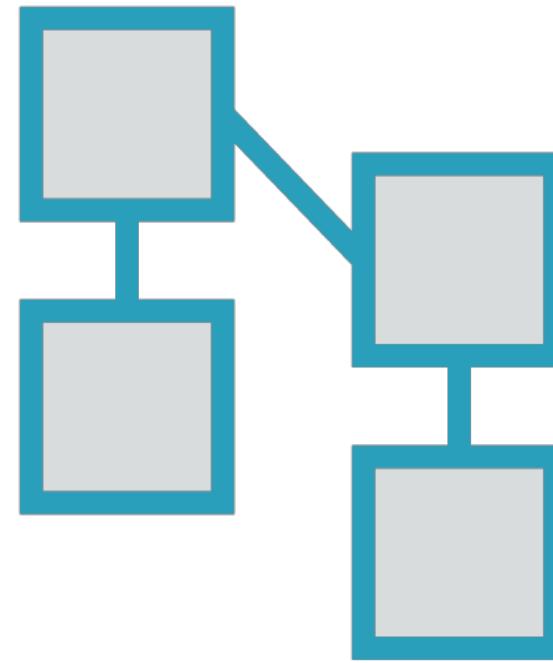


How the original developer intended the unit to be used



Executable: keeps in sync with the unit under test

Design the Units



Decompose into testable units
Loose Coupling & High Cohesion
more likely



**Design interface &
implementation separately**
By ‘interface’ I mean function
name, parameter list, return type

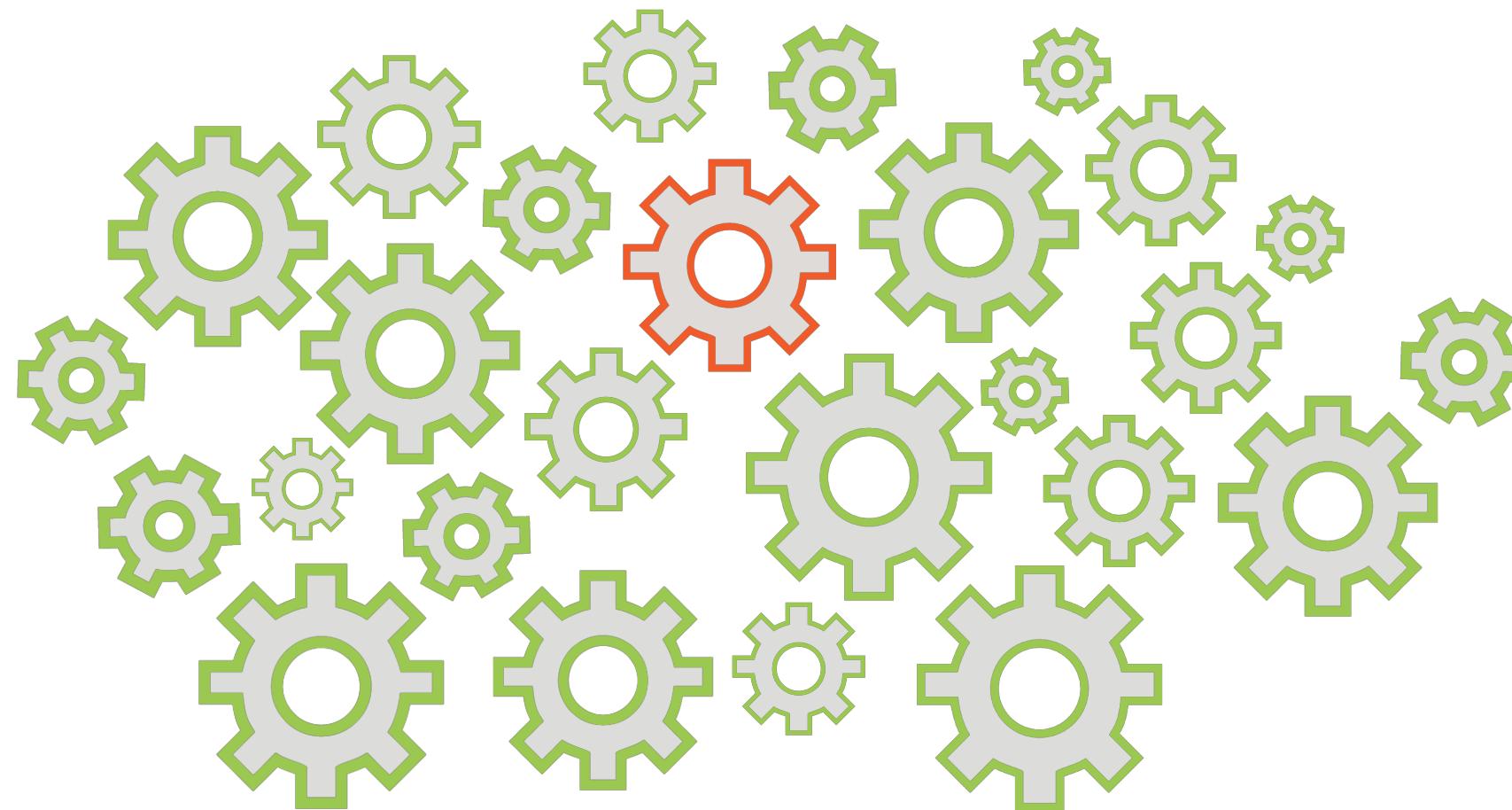


Regression Testing

Ensure previously developed and tested software still performs after a change

https://en.wikipedia.org/wiki/Regression_testing

Pinpoint Failure



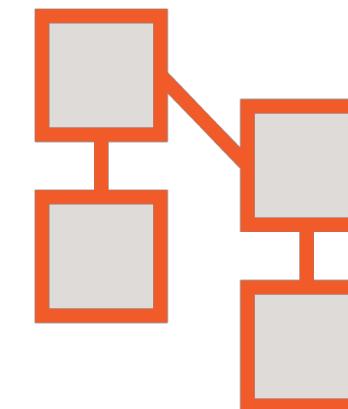
What Is Unit Testing For?



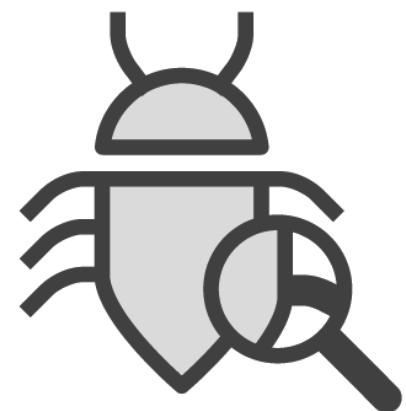
**Understand what
to build**



**Document the
units**



Design the units



**Regression
protection**

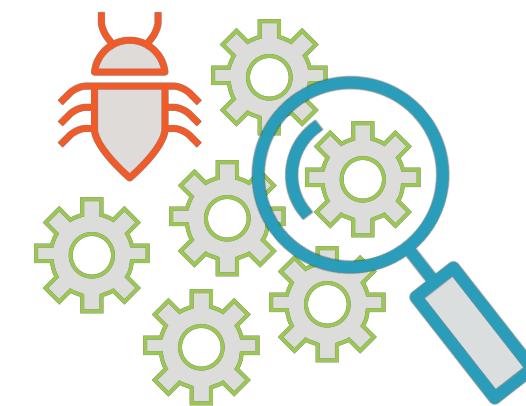
Limitations of Unit Testing



Hard to write if units have many dependencies



Test scenarios may not occur in production



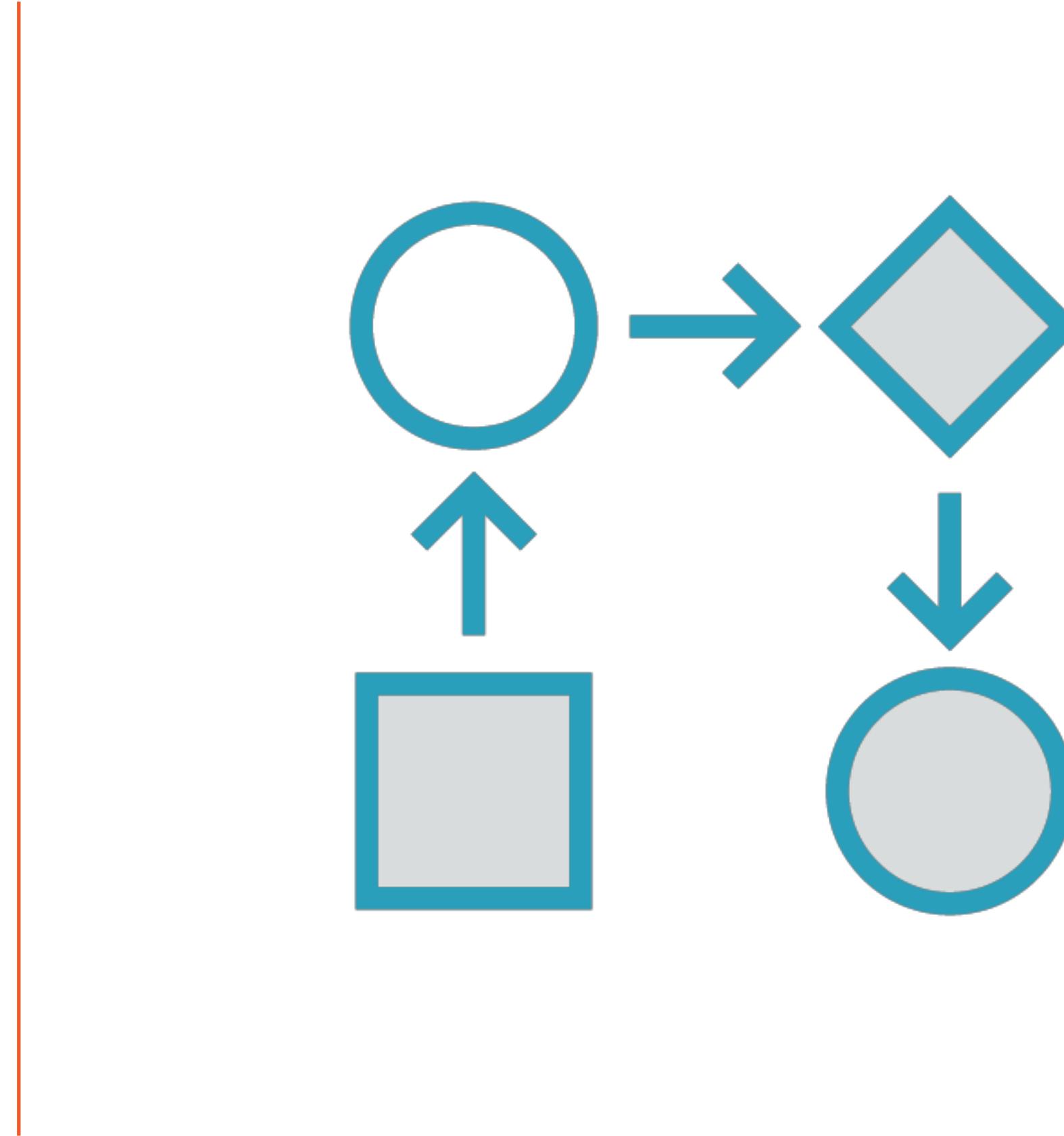
Tests may not notice failures



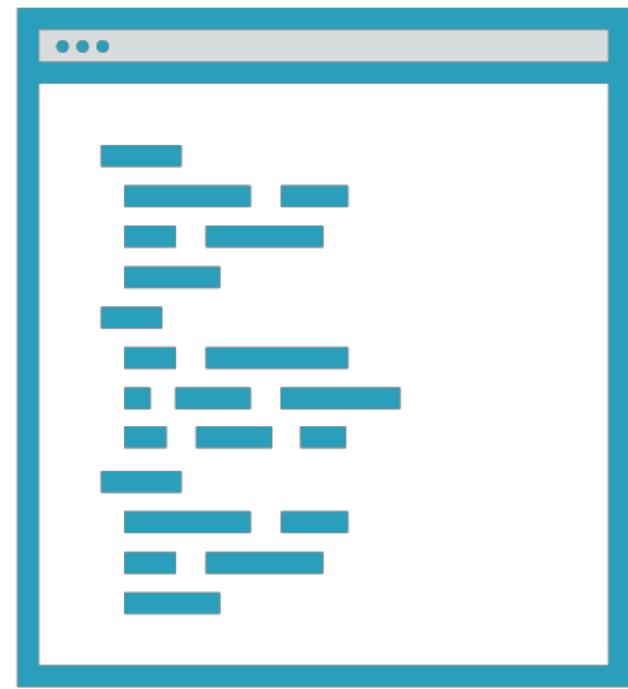
Unit tests do not find integration or non-functional problems

Your Personal Development Process

Whiteboard sketches
REPL
Tests First
...



Unit Testing Is Part of Your Job

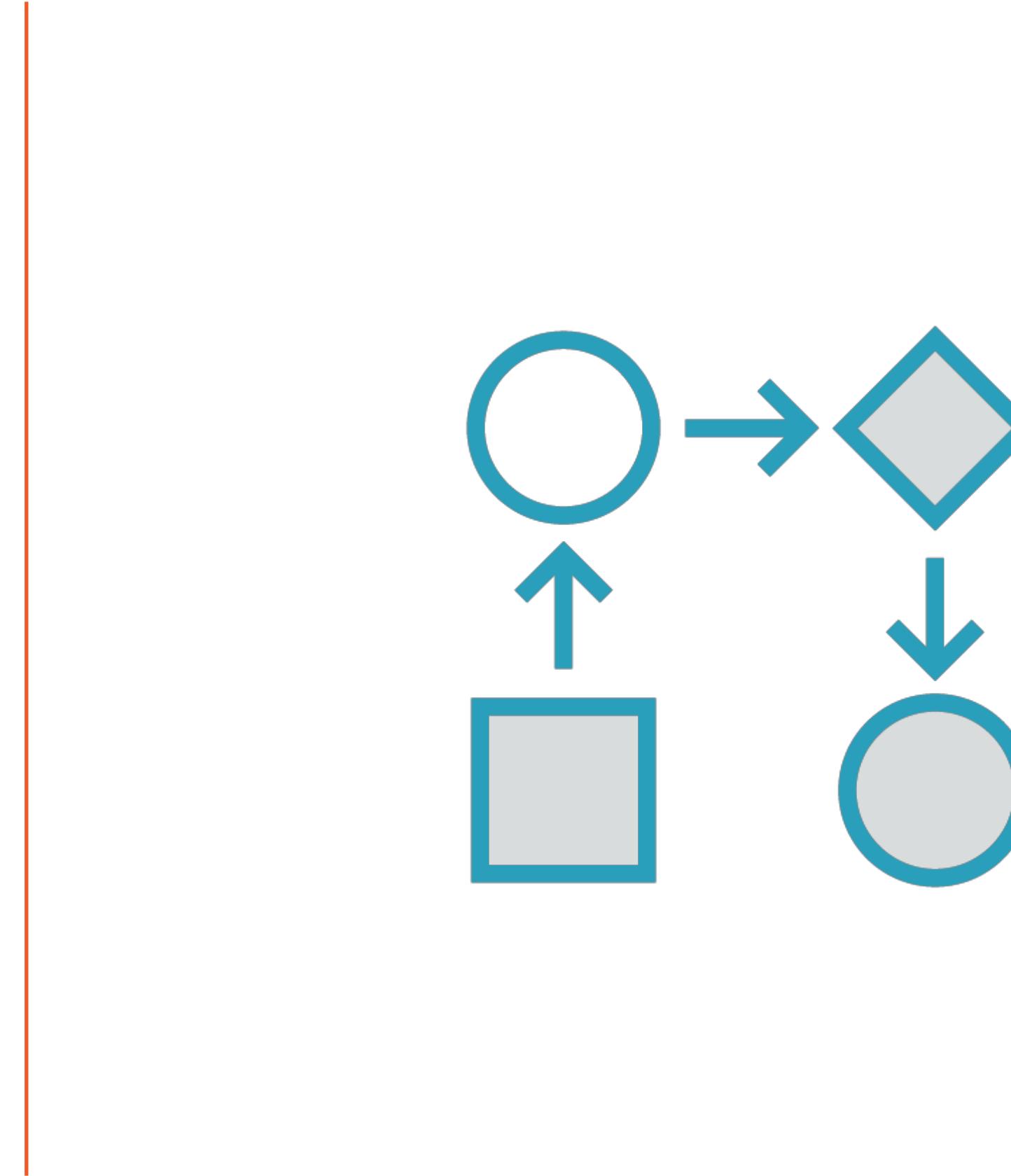


Units of Code



Automated Unit Tests

Test Last
Test First
Test Driven



Tests come after code

Test when design is stable

Write Code



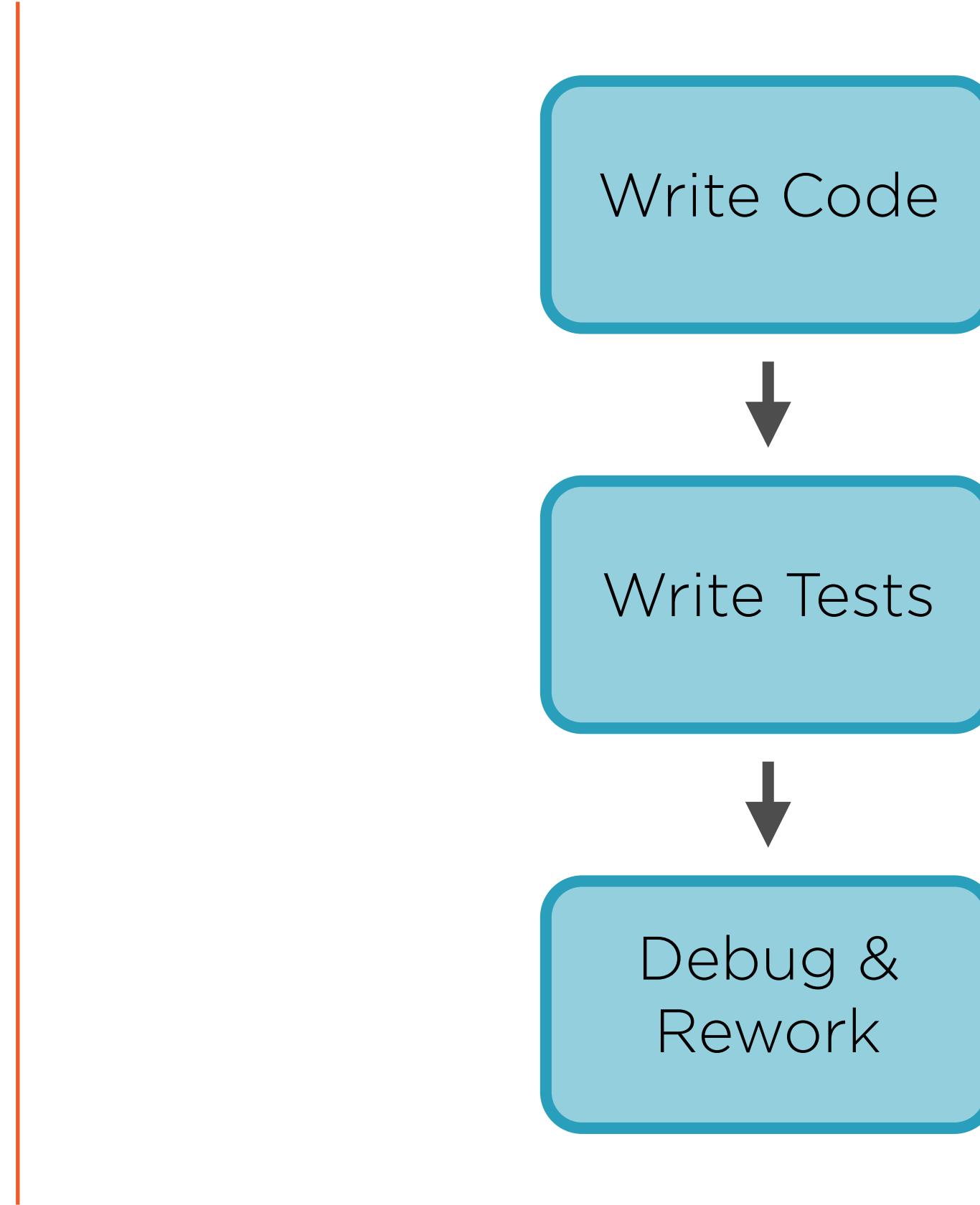
Write Tests

Tests come after code

Risk of untestable design

Discover bugs late

Tests are rushed

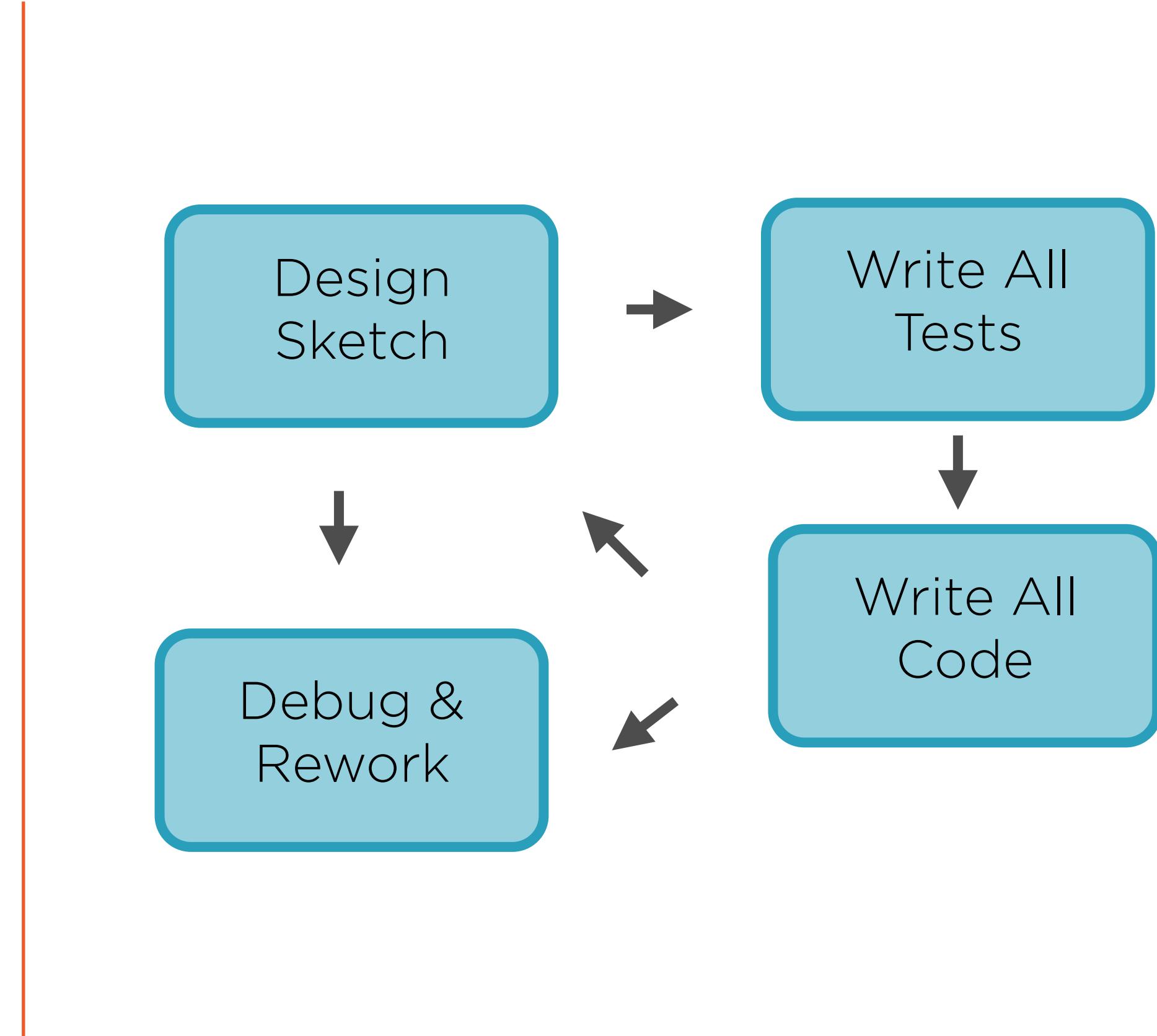


All Tests written early

Design is testable

Hard to predict all cases

You will end up iterating

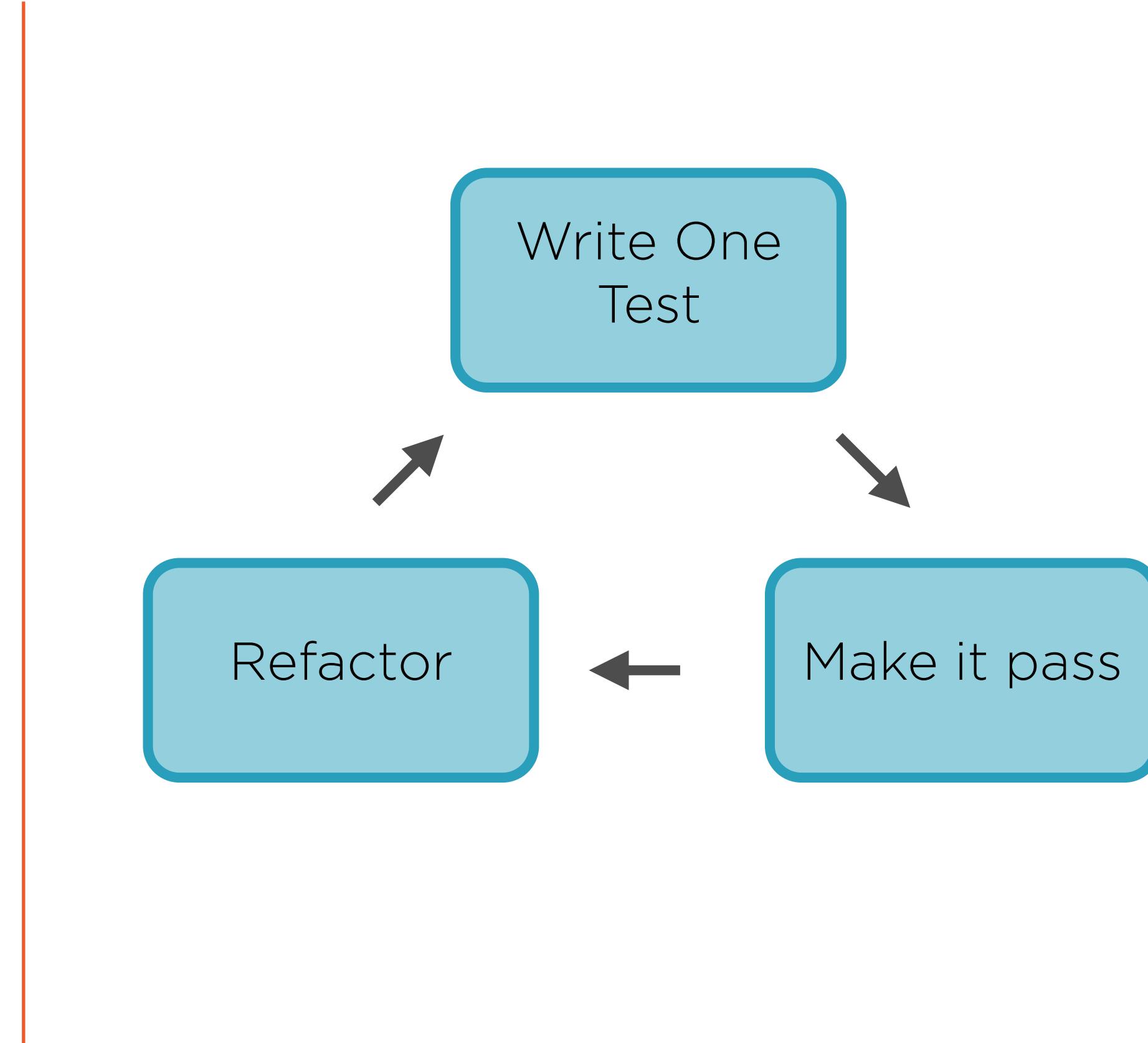


The tests drive the process

Unfamiliar way of working

Takes discipline

Refactoring takes skill



Your Team Development Process

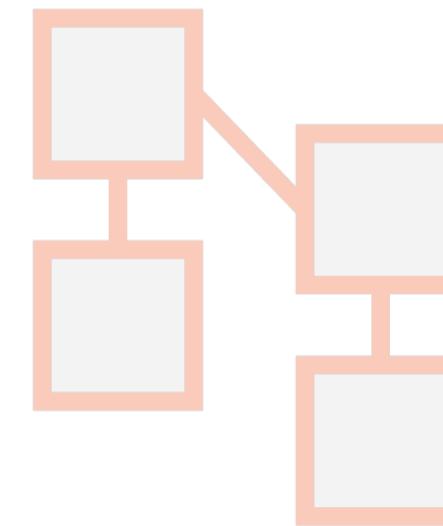
Shared Unit Tests



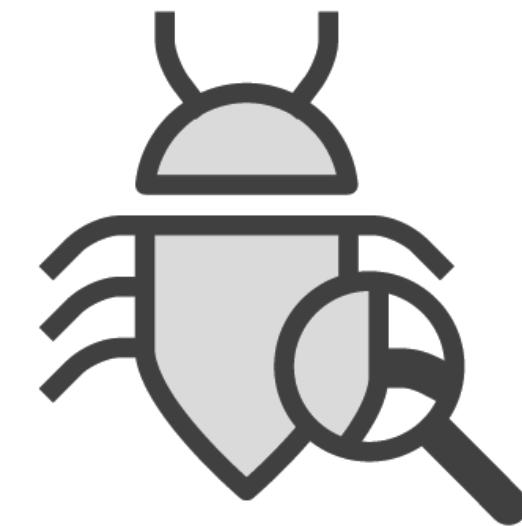
Understand what
to build



**Document the
units**

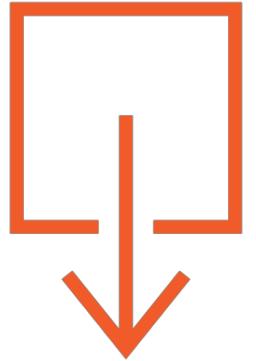


Design the units



**Regression
protection**

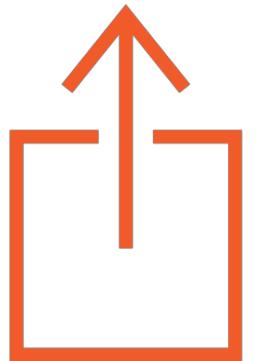
Tests Support Collaboration



Pull changes from version control

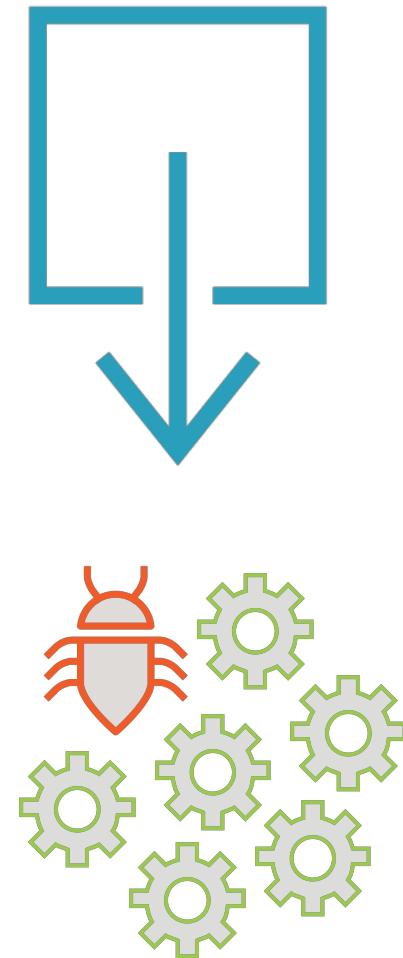


Run the tests & check they pass before changing code

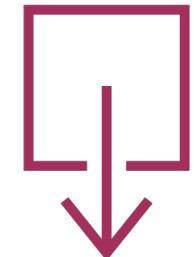


Run the tests again before sharing your changes

People Aren't Perfect



Build Automation Server



Detects changes from version control, fetches them



Builds the code & runs the tests



Communicates the result to developers



If passing tests - deploys to manual testing environment

Monitoring Build Status

[Back to Dashboard](#)

[Status](#)

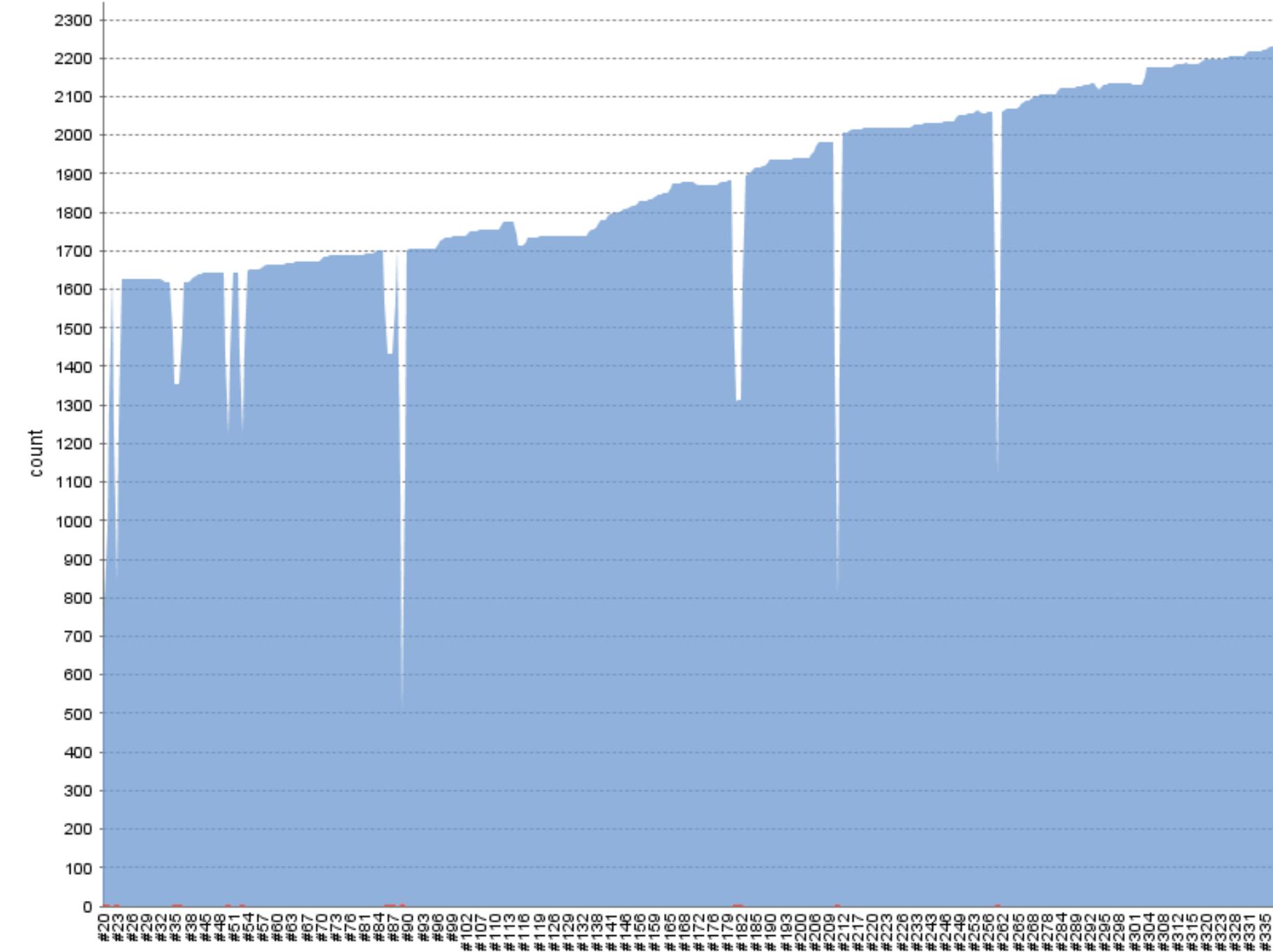
[Changes](#)

[Workspace](#)

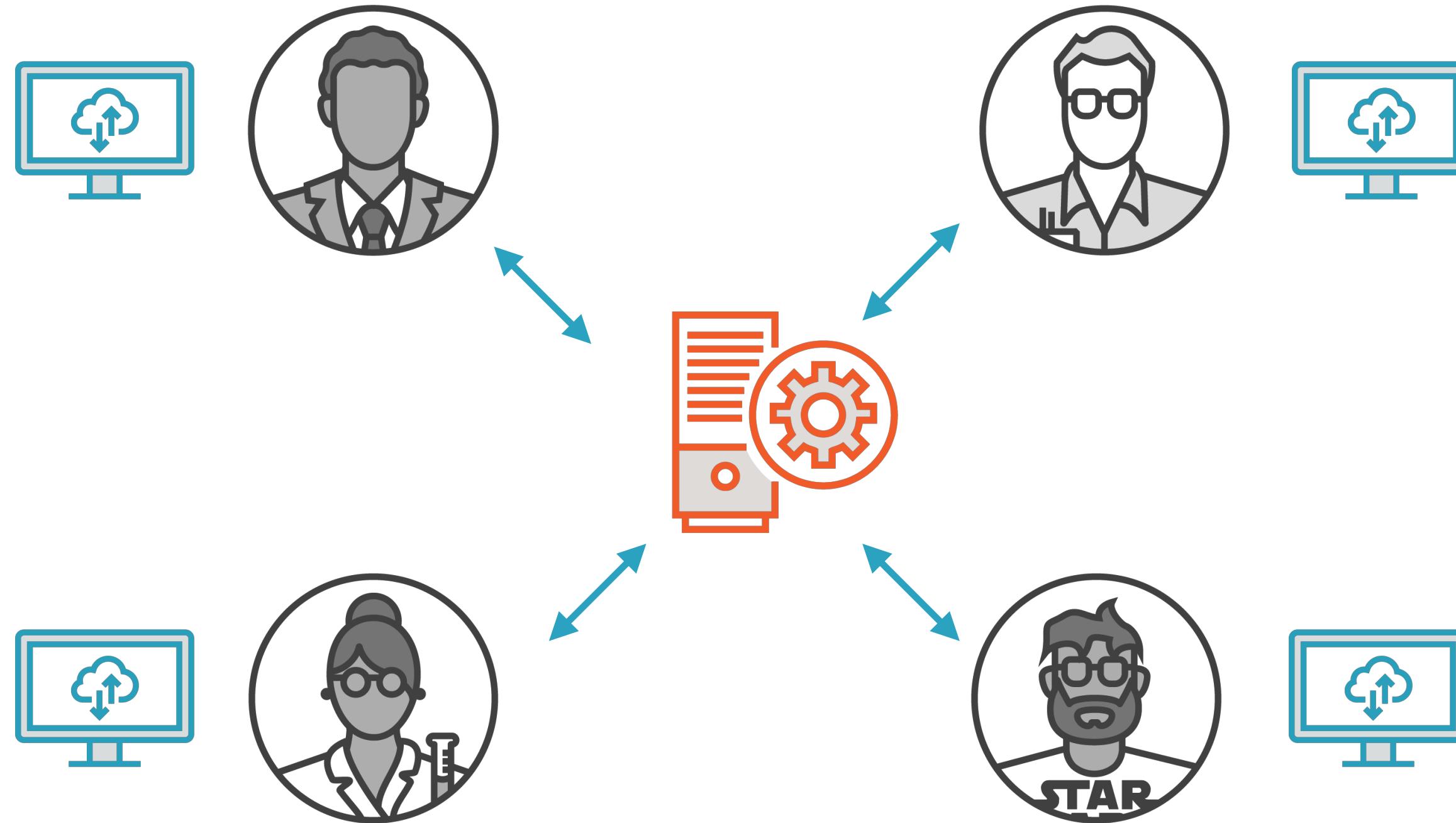
[Git Polling Log](#)

Build History (trend)

Build ID	Date
#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 5:51:22 PM



Continuous Integration



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

Summary

What is Unit Testing for?

Test First, Test Last, Test Driven

Unit testing in the Development Process