

I will make you  
a better C# developer  
2018 edition  
**Aspects of Testing**

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# Test Driven Debugging

# Test Driven Debugging

- A bug in the wild is always an indication of two bugs
  1. The bug itself
  2. The bug in testing that allowed it to get into the wild
- Fix the second bug first
  - Write a failing test to reproduce the problem
- Fix the bug, prove it with a test

*This is hard in an increasingly common set of problems that stem from configuration, bad dependencies, and other environment issues*

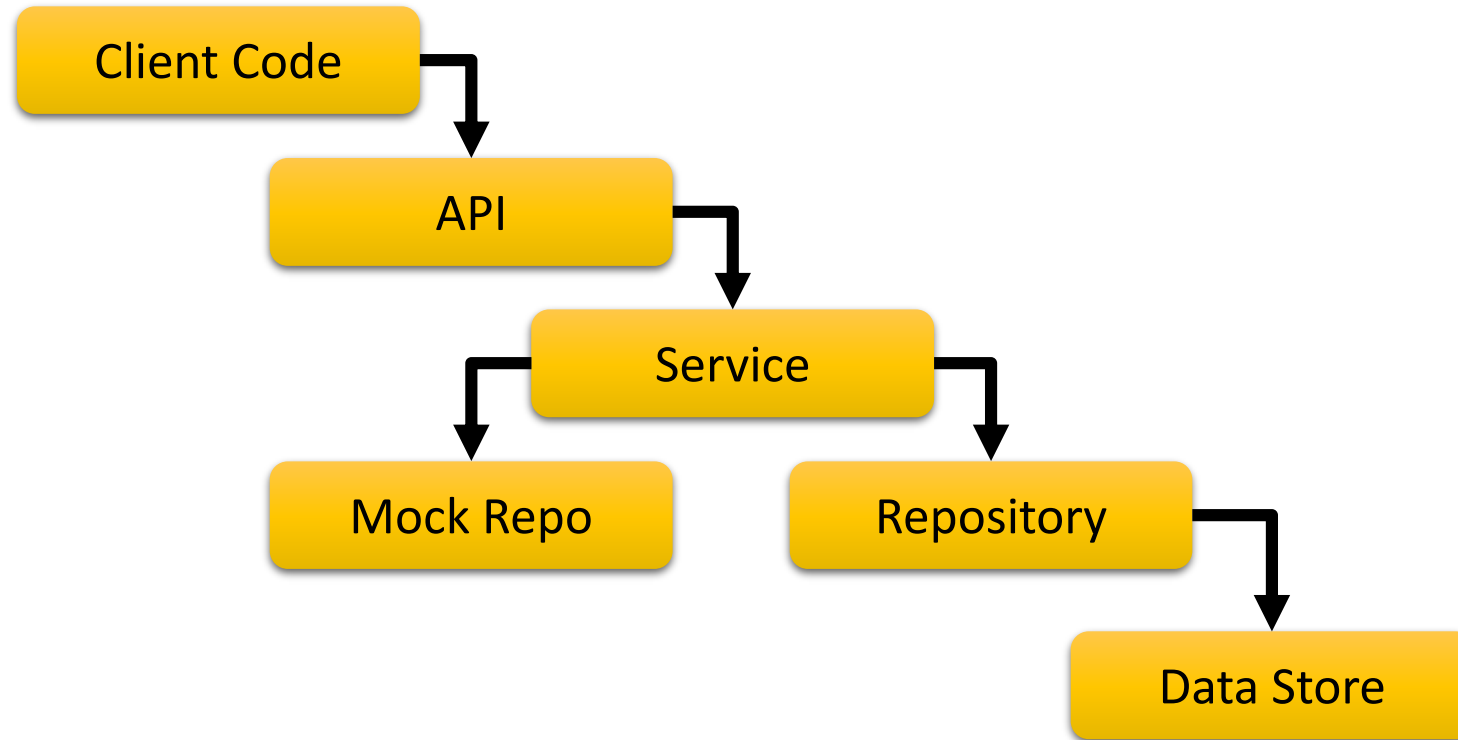
# Legacy Code

- Michael Feather's *Working Effectively with Legacy Code*
  - Defines legacy code as “code not under test”
- Unit tests provide value as...
  - Regression (debugging)
  - Developers to know they are done (lots of short loop debugging during development)
  - Confirmation that everything's right in the dev workflow (build servers)
  - Quality, maybe
- Seams must be found or created to allow unit testing

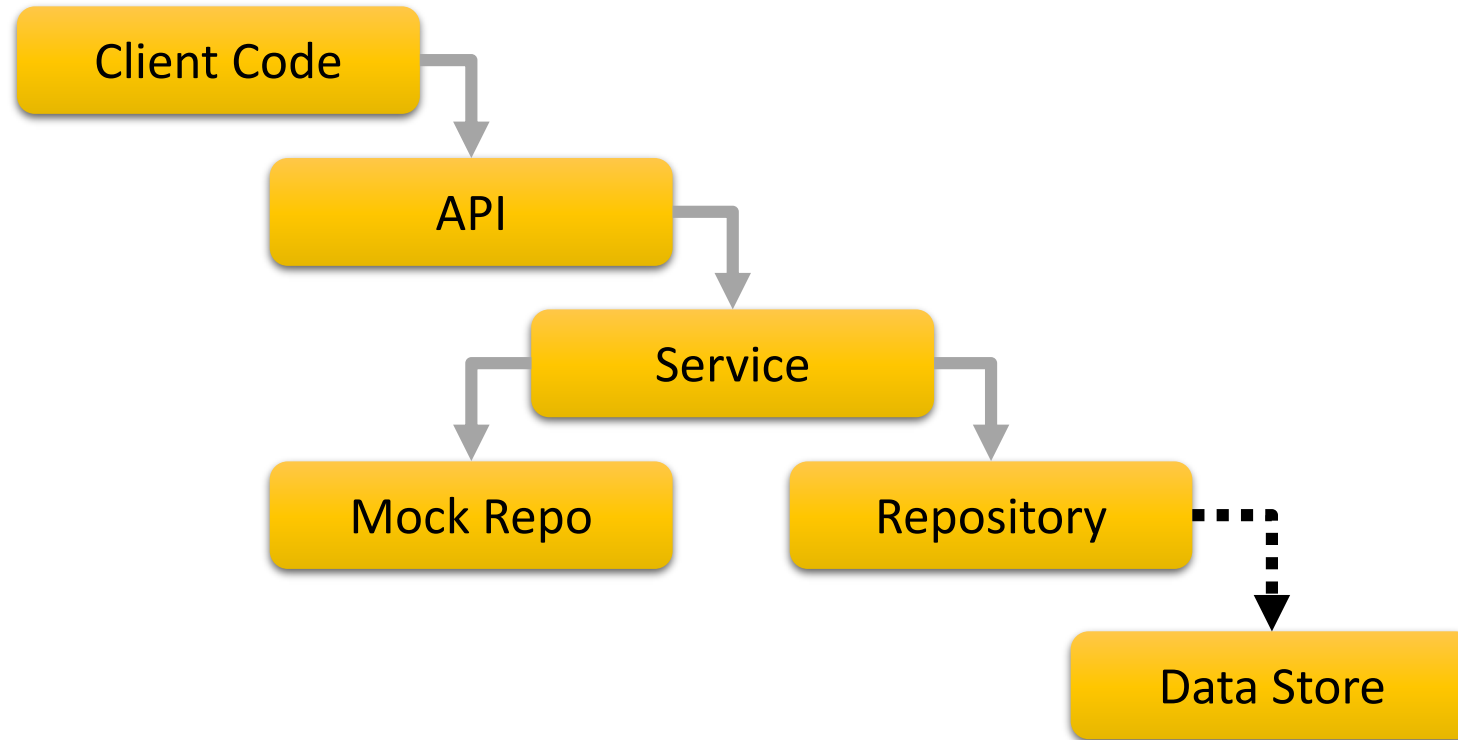
# Seam

A seam is a place where you can alter behavior in your program without editing in that place.

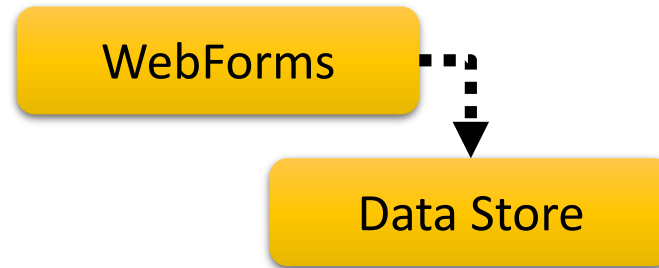
# Seams in a Service Driven App



# Seams in a Service Driven App

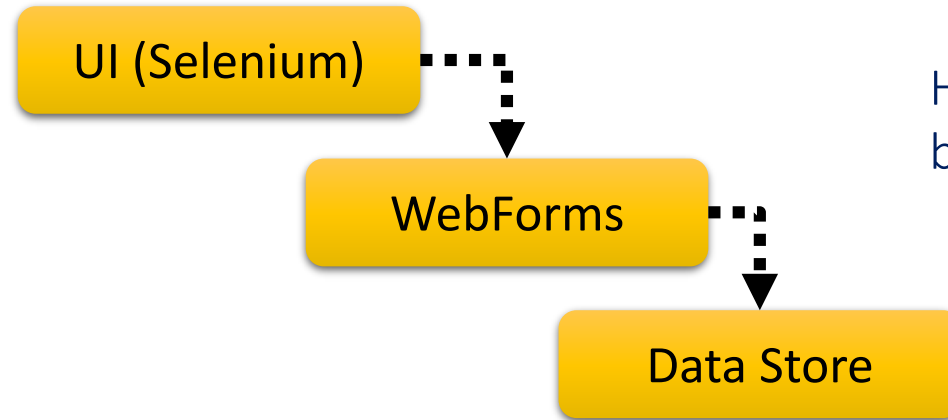


# Legacy WebForms App



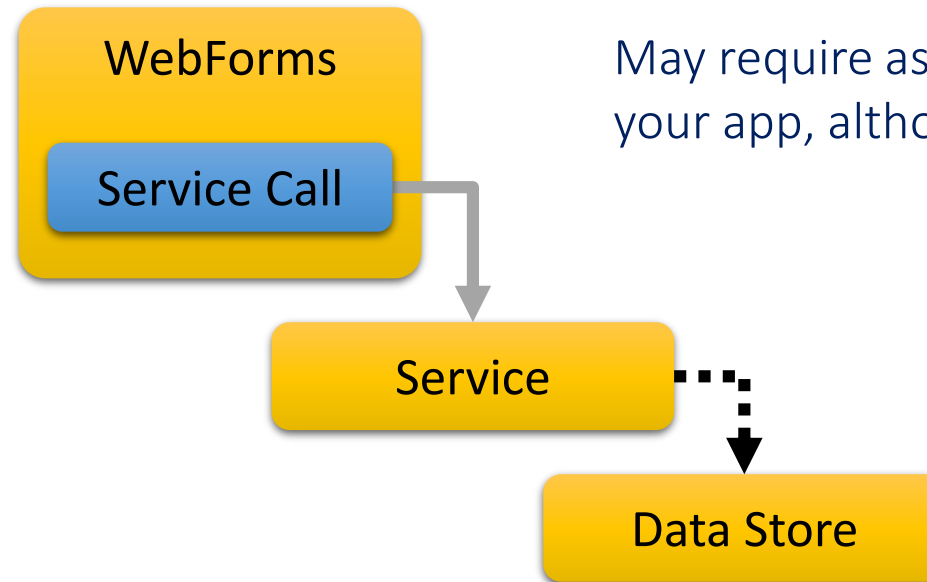


# Legacy WebForms App



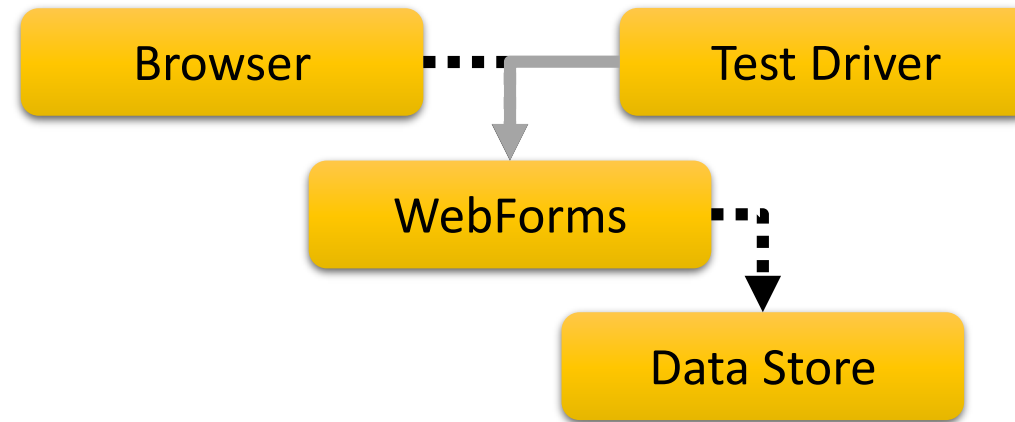
Helps quality, particular smoke,  
but too slow to help developers

# Legacy WebForms App



May require as much effort as rewriting your app, although lower risk

# Legacy WebForms App

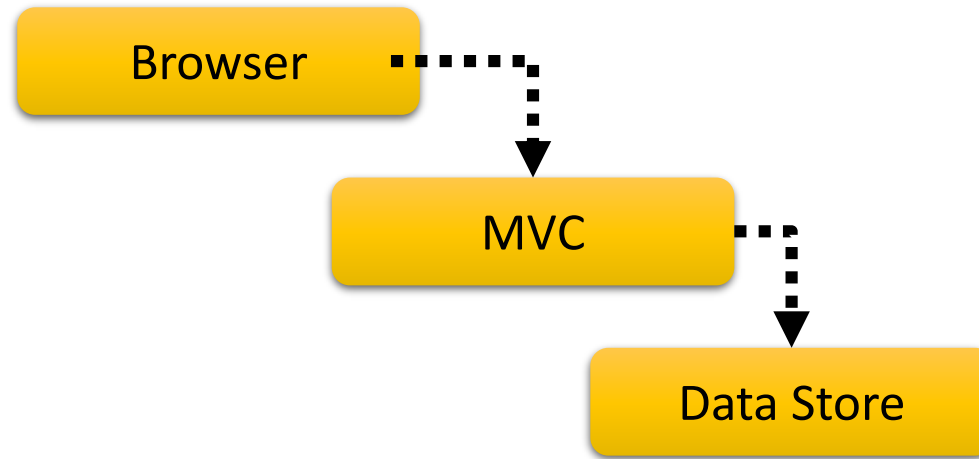


Sets up the WebForms environment and issues calls on the test behalf

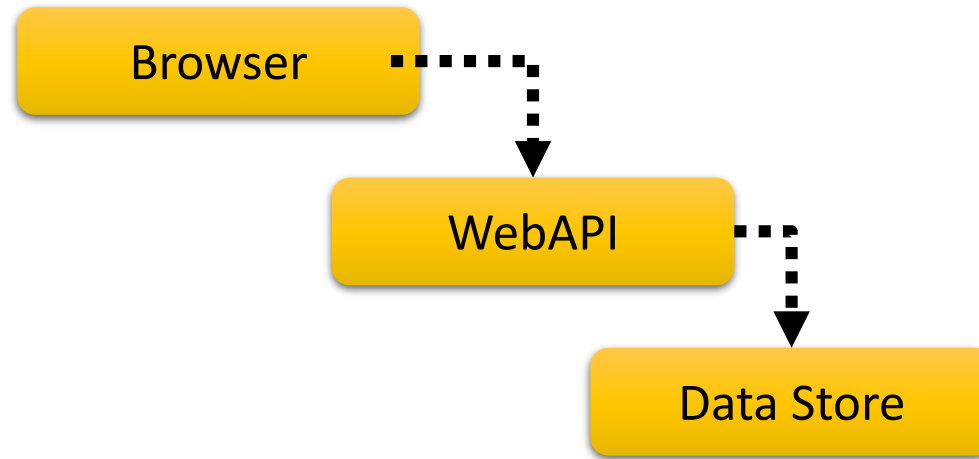
**WebFormsTest**  
<https://github.com/csharpfritz/WebFormsTest/issues>



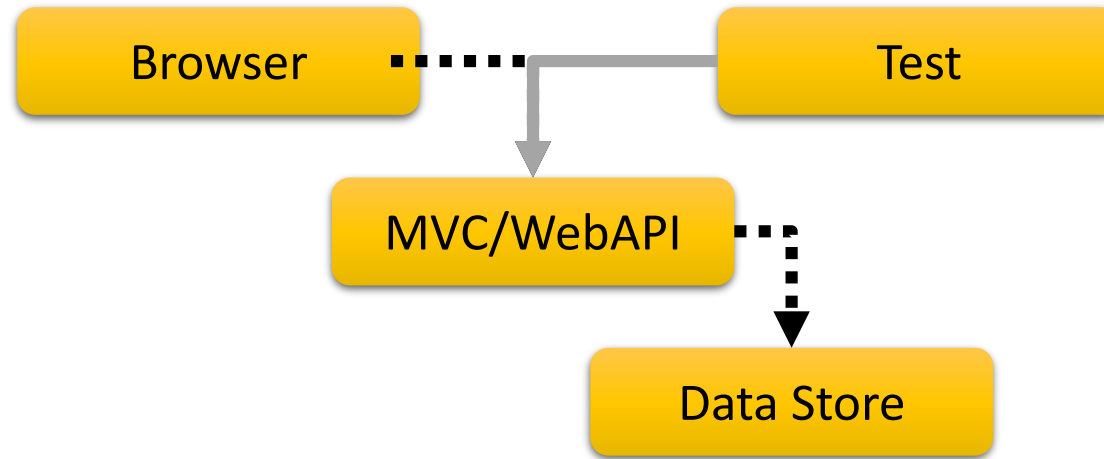
# Legacy MVC App



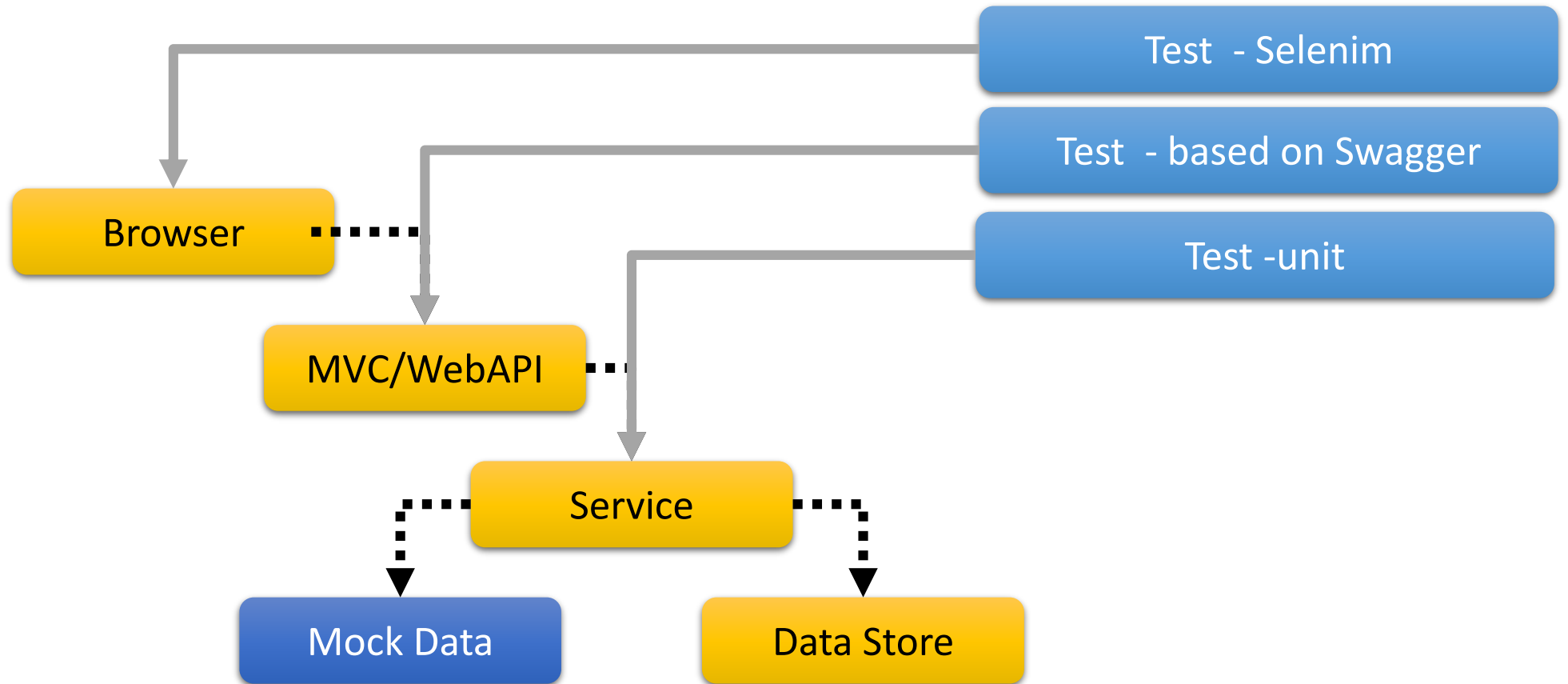
# Legacy MVC App



# Legacy MVC/WebAPI App



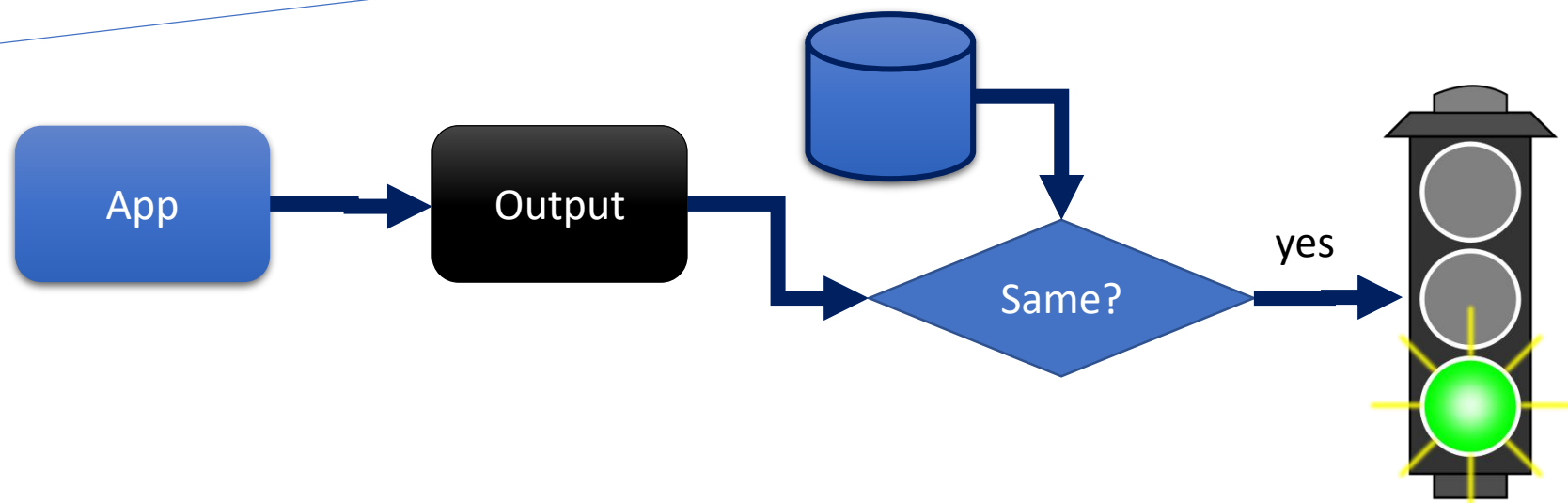
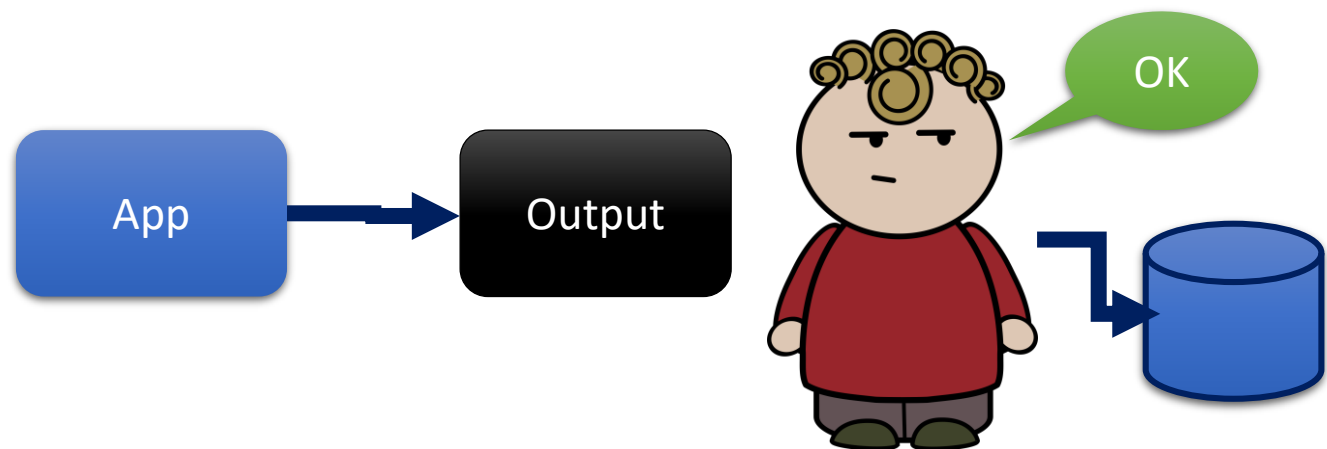
# Testable MVC/WebAPI App

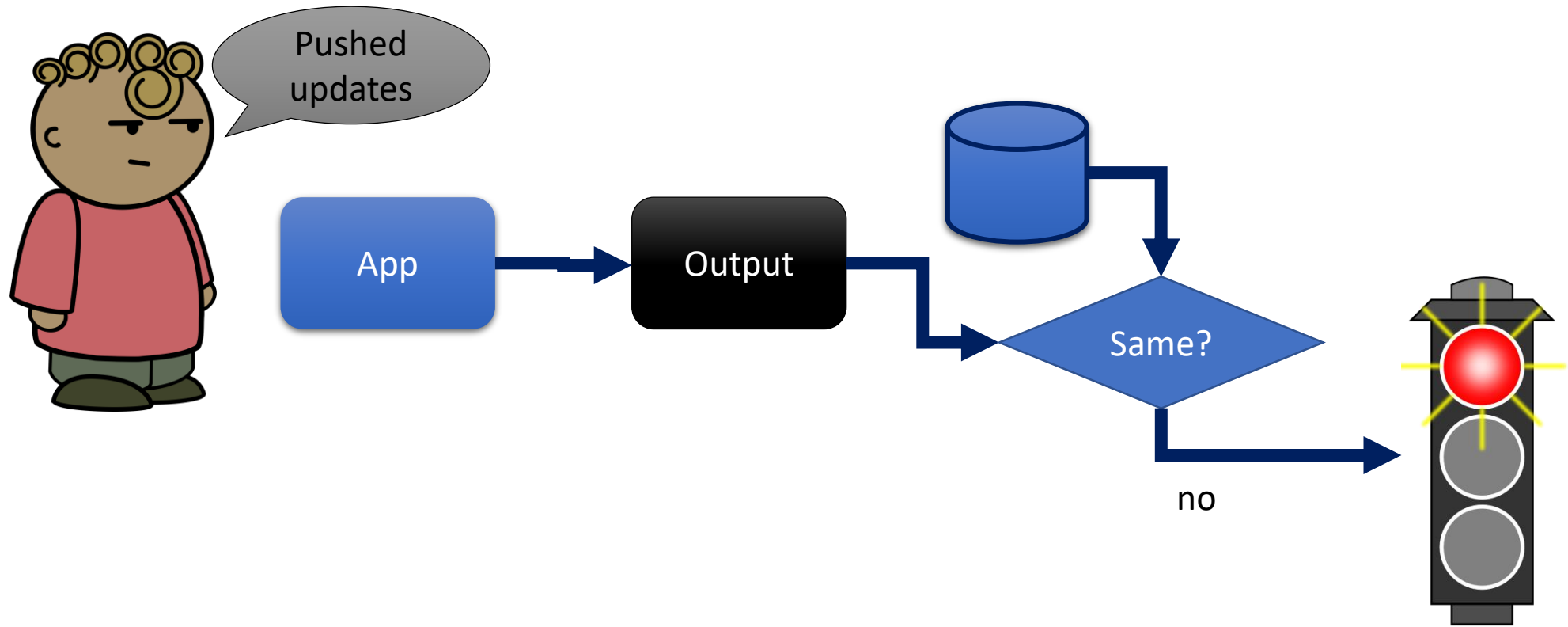


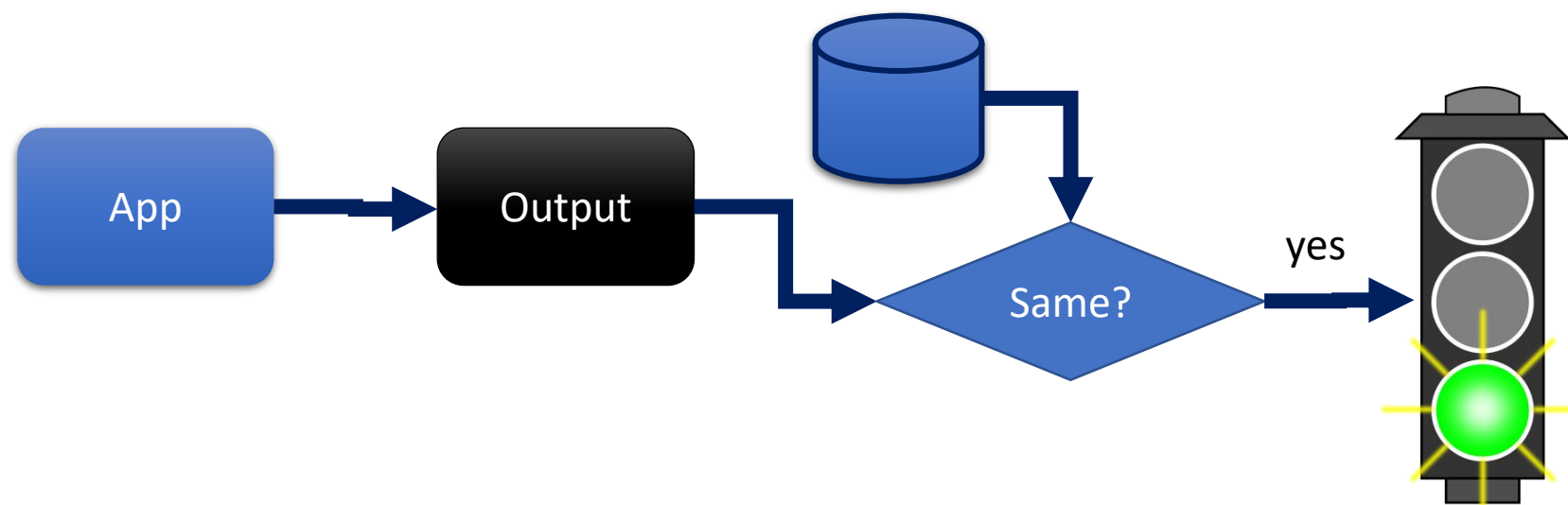
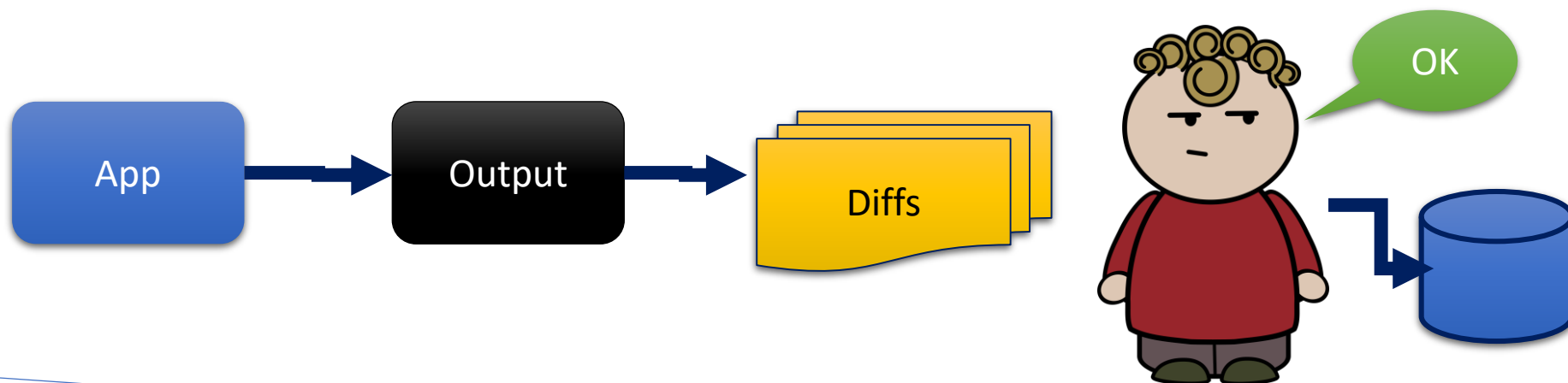
# Approval Tests

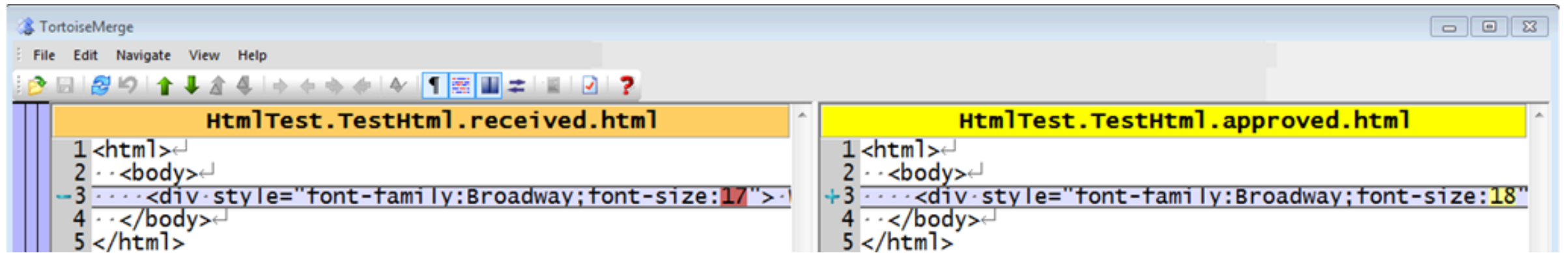
<http://approvaltests.com/>











<http://blog.approvaltests.com/2011/12/using-reporters-in-approval-tests.html>