

Test-driven Development in Action



Course Outline



Software development challenges

What is test-driven development?

Different ways of testing applications

Test-driven development in action

Strategies/techniques for testing code

Test-driven development gotchas

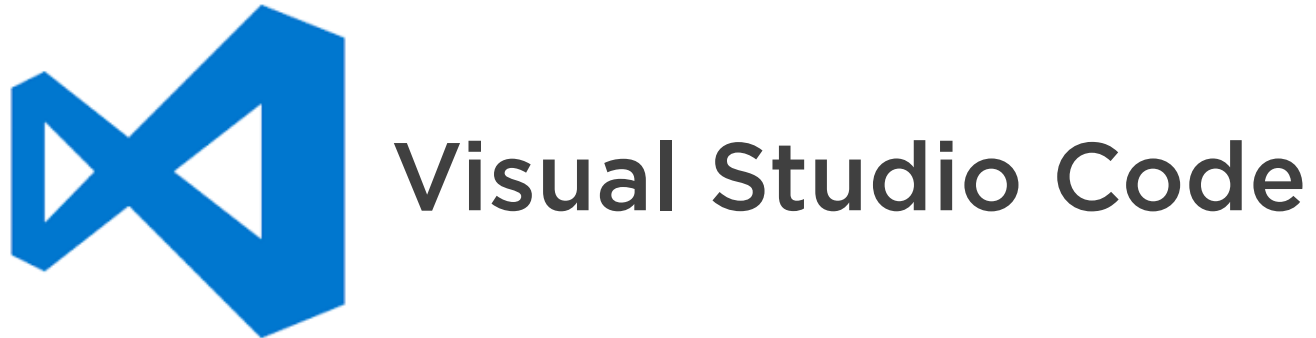
Examples



FizzBuzz



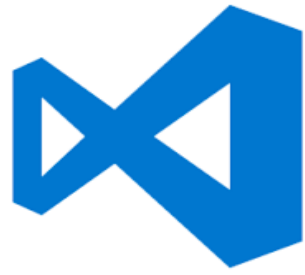
Stacks



**Microsoft®
Visual C#®**

MSTest

**Visual Studio®
Code**



Visual Studio Code

Visual Studio Code is a free, open source, lightweight code editor that runs everywhere.



<https://code.visualstudio.com/docs/setup/setup-overview>

.NET Core

“.NET Core is a **general purpose** development platform maintained by Microsoft and the .NET community on [GitHub](#). It is **cross-platform**, supporting Windows, macOS and Linux, and can be used in device, cloud, and embedded/IoT scenarios.”

- <https://docs.microsoft.com/en-us/dotnet/articles/core/index>



<https://www.microsoft.com/net/core>

Setup



Dotnet Watcher - <https://github.com/aspnet/DotNetTools>

```
$> dotnet watch test
```



Unit Testing with `dotnet` - <http://bit.ly/2nmch5z>



<https://github.com/jolson88/TDD-TheBigPicture>



EXPLORER

▶ OPEN EDITORS

▲ FIZZBUZZ-END

▶ .vscode

▲ FizzBuzz.Library

▶ bin

▶ obj

FizzBuzz.Library.csproj

FizzBuzzService.cs

▲ FizzBuzz.Tests

▶ bin

▶ obj

FizzBuzz.Tests.csproj

FizzBuzzTests.cs

FizzBuzzTests.cs ×

FizzBuzzService.cs

```
1 using Microsoft.VisualStudio.TestTools.UnitTesting;
2 using FizzBuzz.Library;
3
4 namespace FizzBuzz.Tests
5 {
6     [TestClass]
7     0 references
8     public class FizzBuzzTests
9     {
10
11         2 references
12         private FizzBuzzService _fizzBuzz;
13
14         0 references
15         public FizzBuzzTests()
16         {
17             _fizzBuzz = new FizzBuzzService();
18         }
19
20         [TestMethod]
21         0 references
22         public void ShouldPrintNumber()
23         {
24             var result = _fizzBuzz.Calculate(1);
25             Assert.AreEqual("1", result);
26         }
27     }
28 }
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

1: dotnet



Build completed.

Test run for /Users/jolson88/Source/personal/TDD-TheBigPicture/FizzBuzz-End/FizzBuzz.Tests/bin/Debug/netcoreapp1.1/FizzBuzz.Tests.dll(.NETCoreApp,Version=v1.1)

Microsoft (R) Test Execution Command Line Tool Version 15.0.0.0
Copyright (c) Microsoft Corporation. All rights reserved.

Starting test execution, please wait...

Total tests: 1. Passed: 1. Failed: 0. Skipped: 0.

Test Run Successful.

Test execution time: 0.8963 Seconds

watch : Exited

watch : Waiting for a file to change before restarting dotnet...

□

Demo



Fizz-Buzz TDD

Given a Positive Number N...

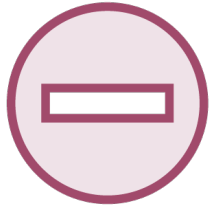
Divisible By 3 -> "Fizz"

Divisible By 5 -> "Buzz"

Divisible By 3 and 5 -> "FizzBuzz"

Otherwise -> N

1	->	"1"
2	->	"2"
3	->	"Fizz"
4	->	"4"
5	->	"Buzz"
6	->	"Fizz"
7	->	"7"
8	->	"8"
9	->	"Fizz"
10	->	"Buzz"
11	->	"11"
12	->	"Fizz"
13	->	"13"
14	->	"14"
15	->	"FizzBuzz"



Red



Green



Refactor



Fake It

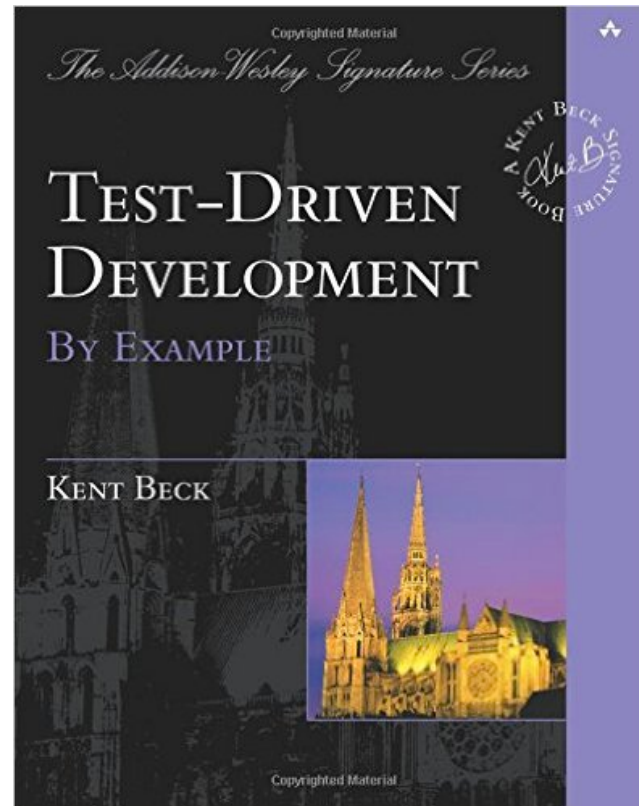


Make It



Triangulate

Detailed TDD Execution Examples



Demo



Code Kata

Simple Stack

```
var s = new MyQueue();  
s.Push("foo");  
Assert.AreEqual("foo", s.Pop());
```

```
s.Push("foo");  
s.Push("bar");  
Assert.AreEqual("bar", s.Pop());  
Assert.AreEqual("foo", s.Pop());
```

```
var s = new MyQueue();  
Assert.AreEqual(null, s.Pop());
```

```
var s = new MyQueue();  
Assert.ThrowsException<Exception>(   
    () => {  
        s.Push(null);  
    }  
);
```

◀ Can pop item off stack

◀ Last-In First-Out (LIFO) stack

◀ Doesn't fail on empty stack

◀ Can't push null

Demo



Code Kata

Generic Stack

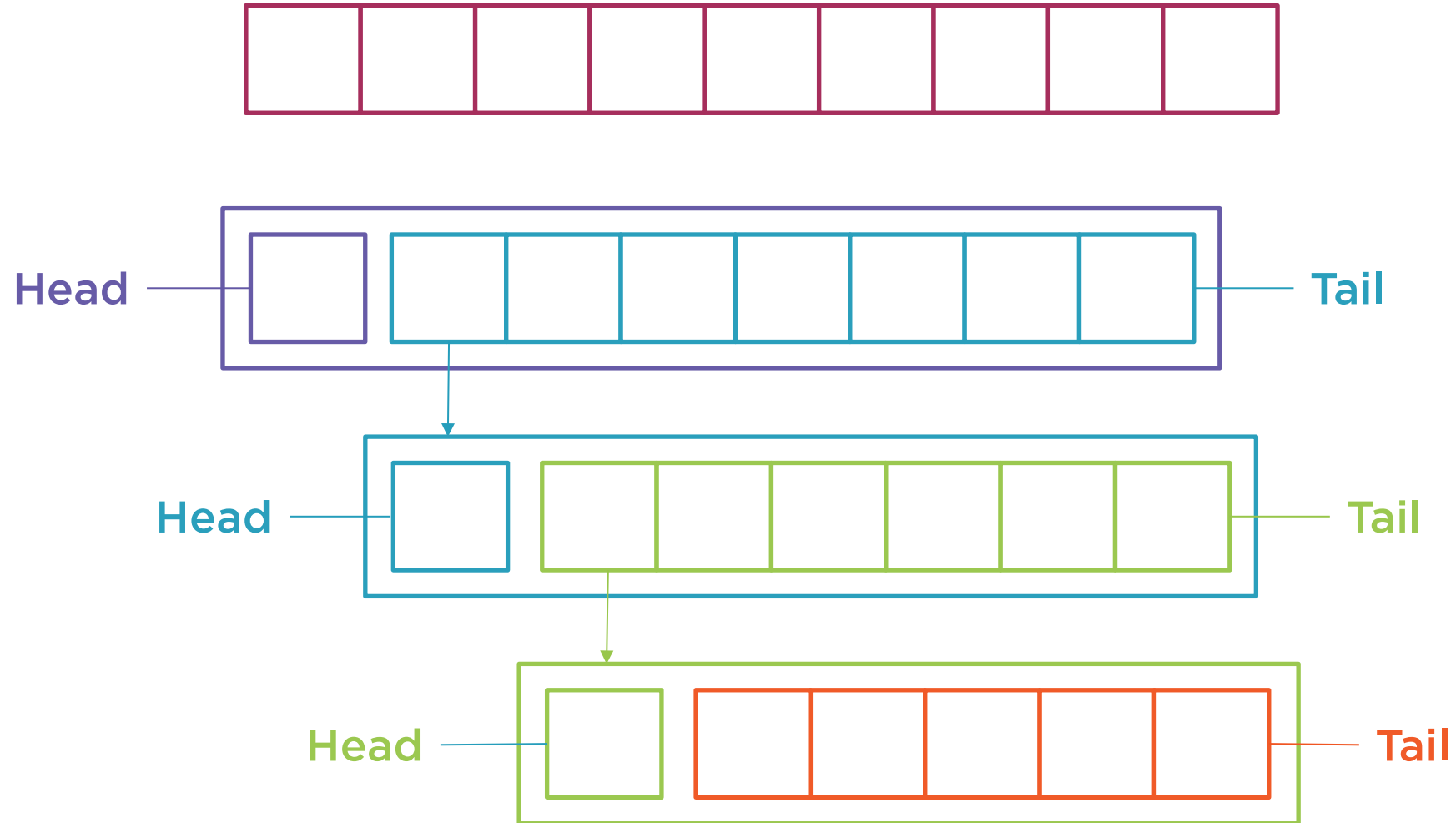
Demo



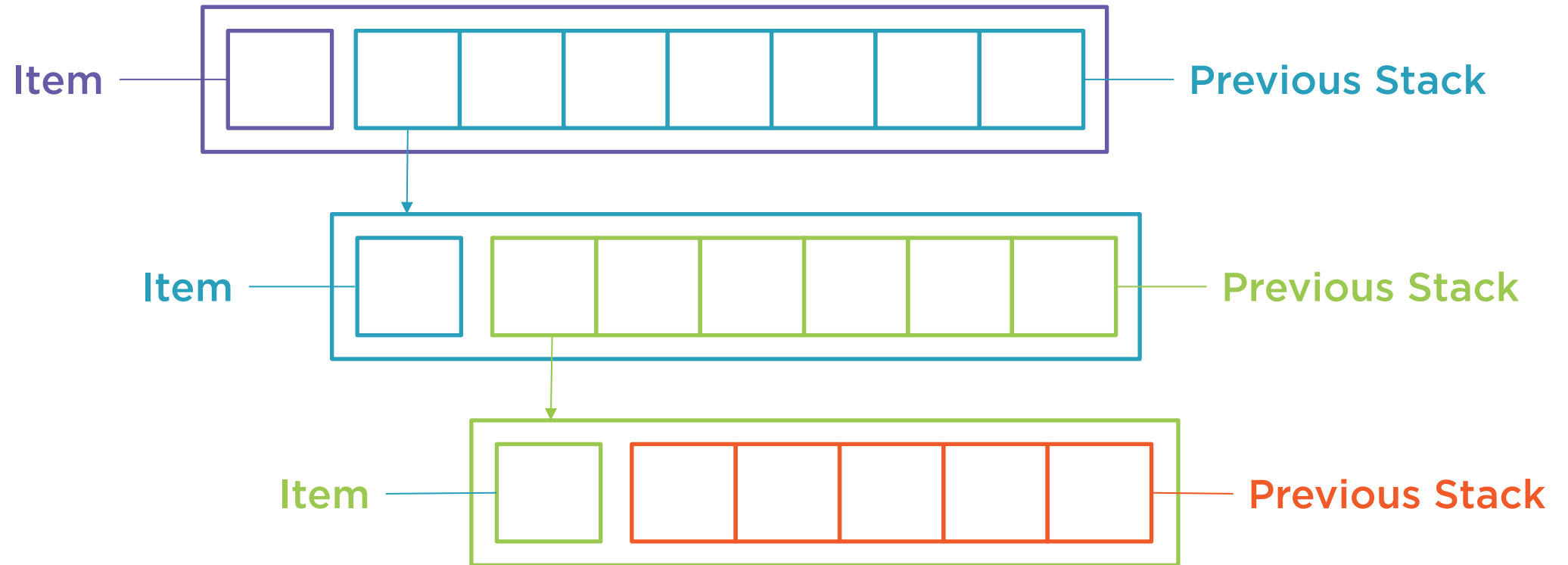
Code Kata

Immutable Stack

Thinking of Lists



Thinking of Immutable Stacks



Code Kata Ideas



Asynchrony



Never touch the mouse



Learn a new editor



Use a new framework

Summary



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