Testing Applications 101

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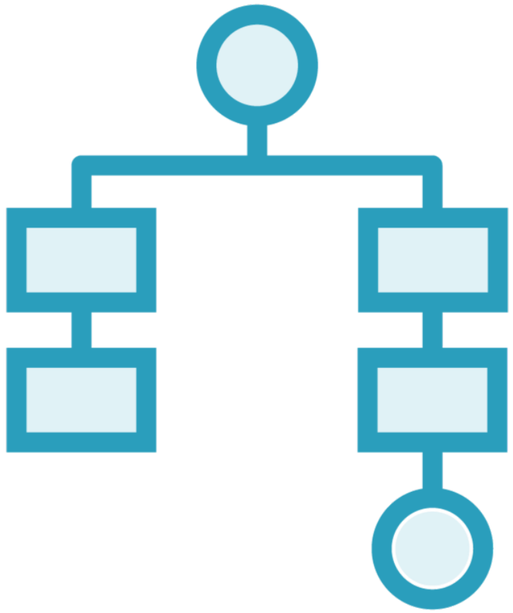
Overview

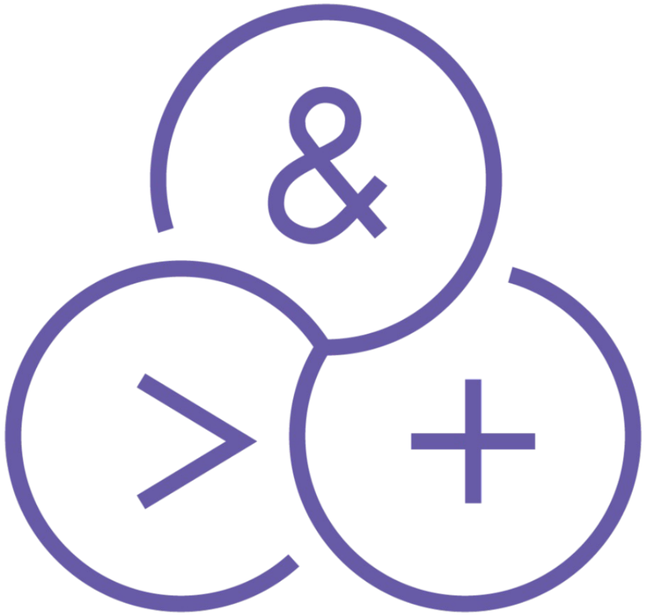
- Types of testing
- Testing frameworks and tools
- Testing concepts
- Insights from testing

Different Types of Testing

Units of Computation



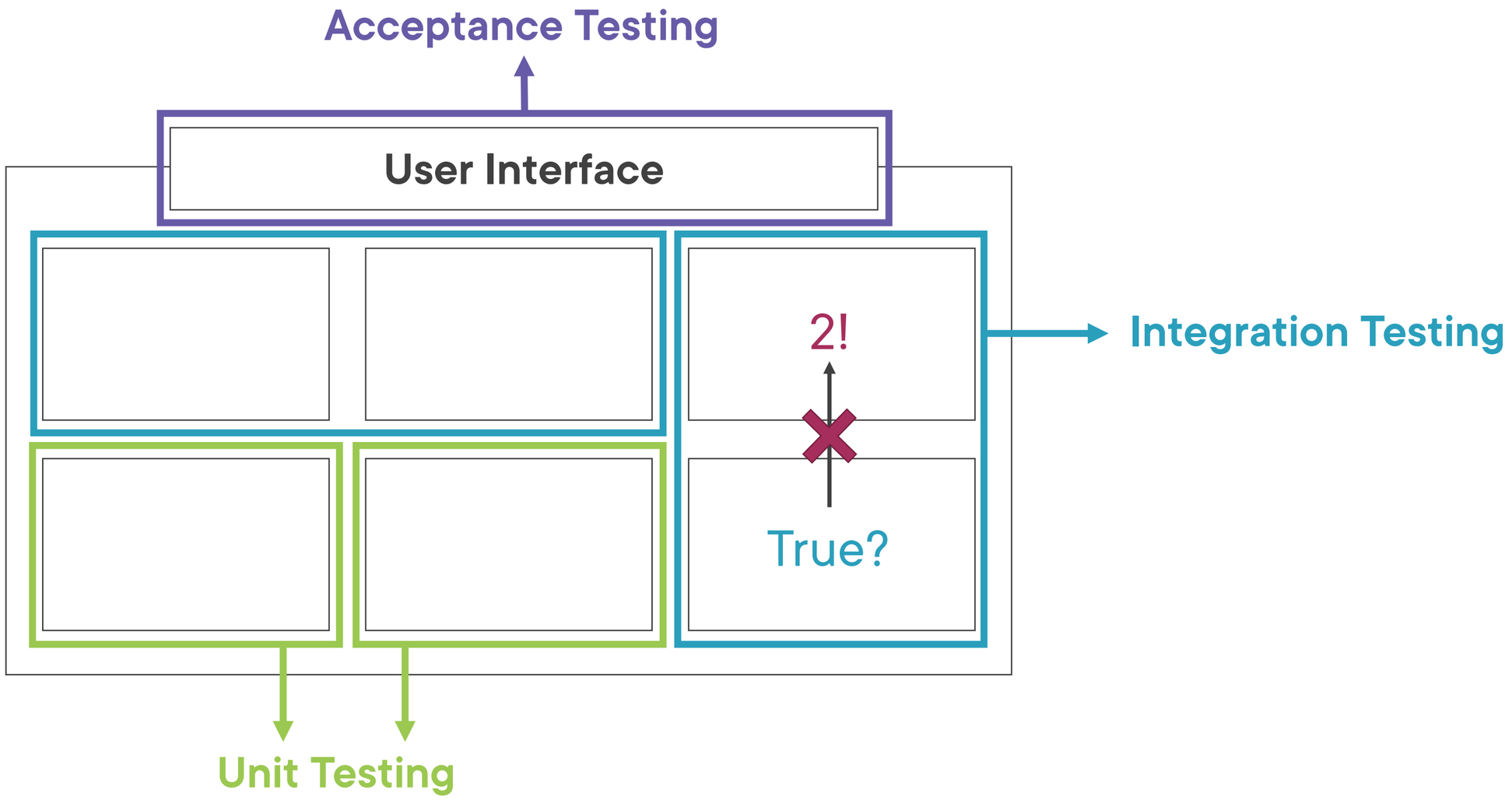
Classes



Functions

Dependencies

Software Testing



Unit Tests == Classes/Functions?

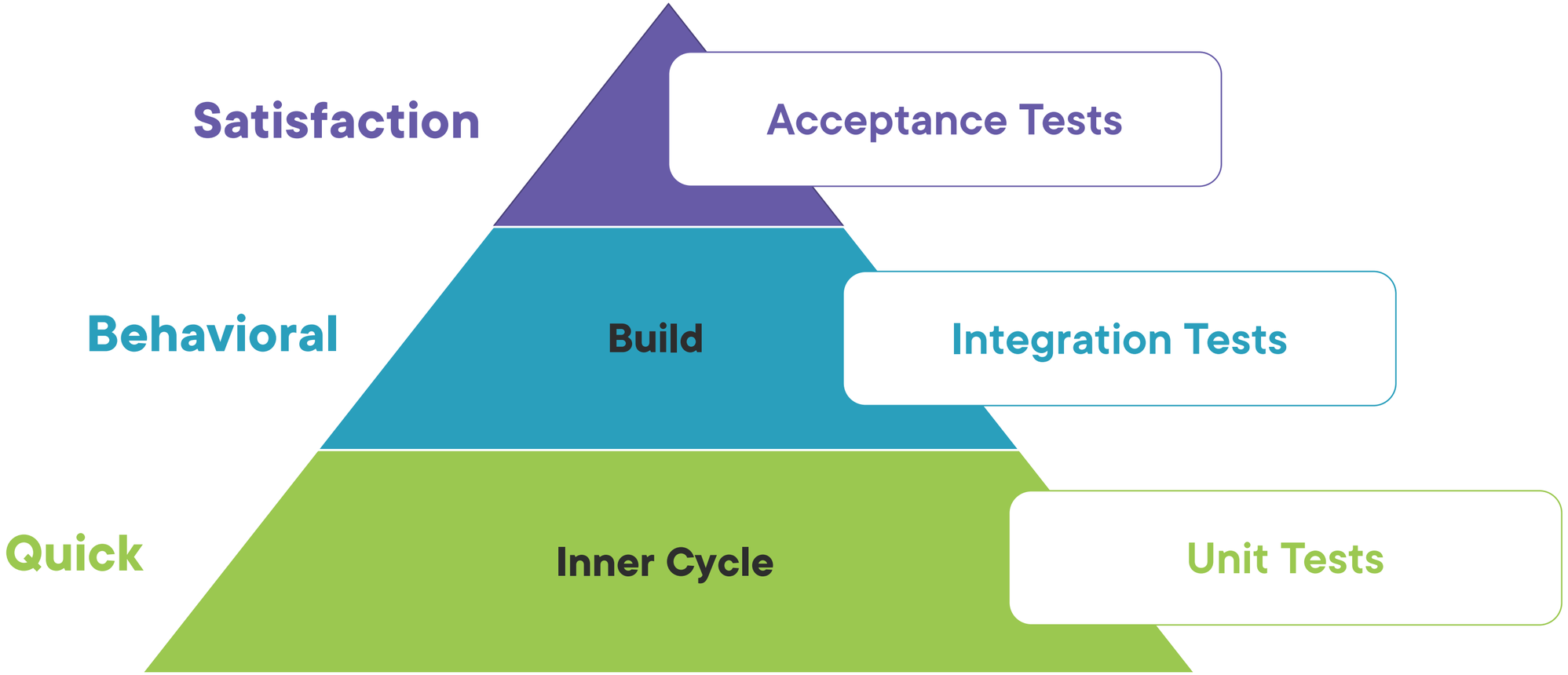
Acceptance Tests == User Interface?

No!

Is one test category
more important than others?

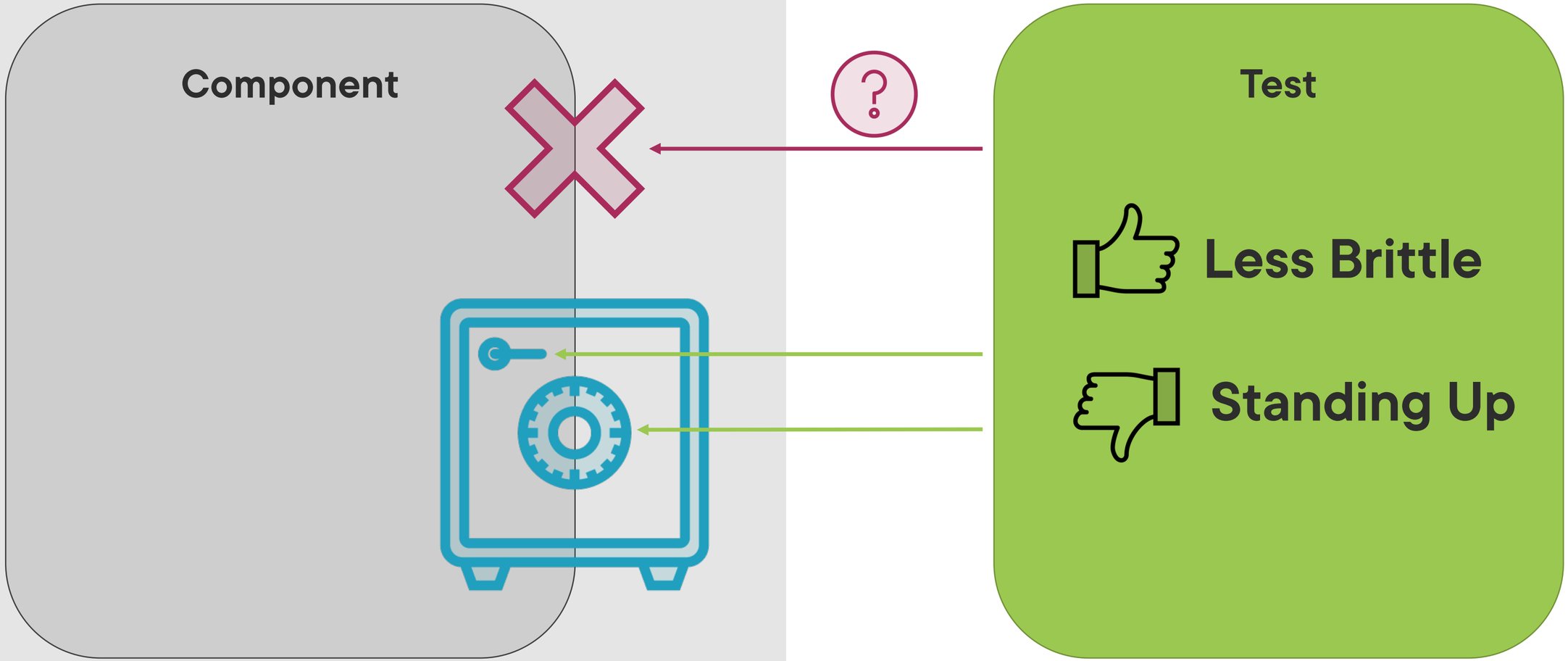
Test-Driven Development
!=
Unit Testing

Balanced Testing

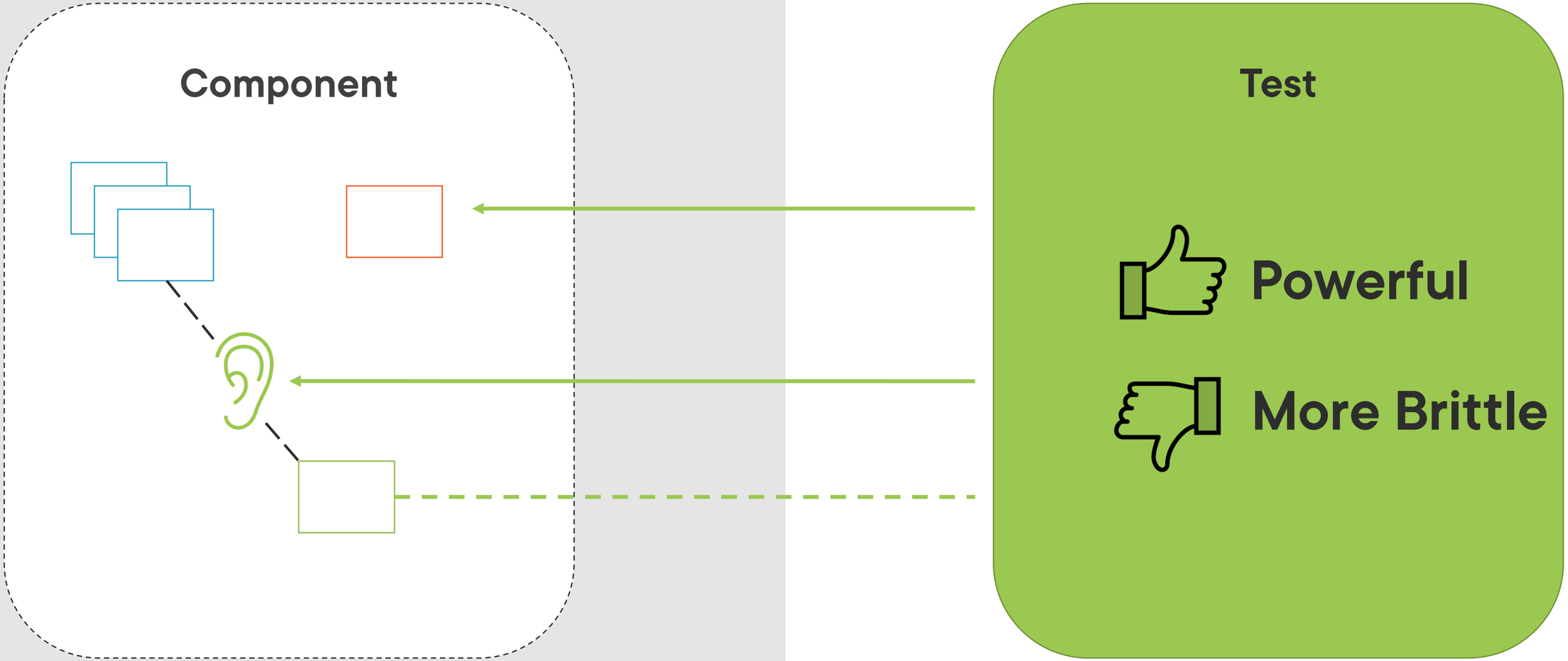


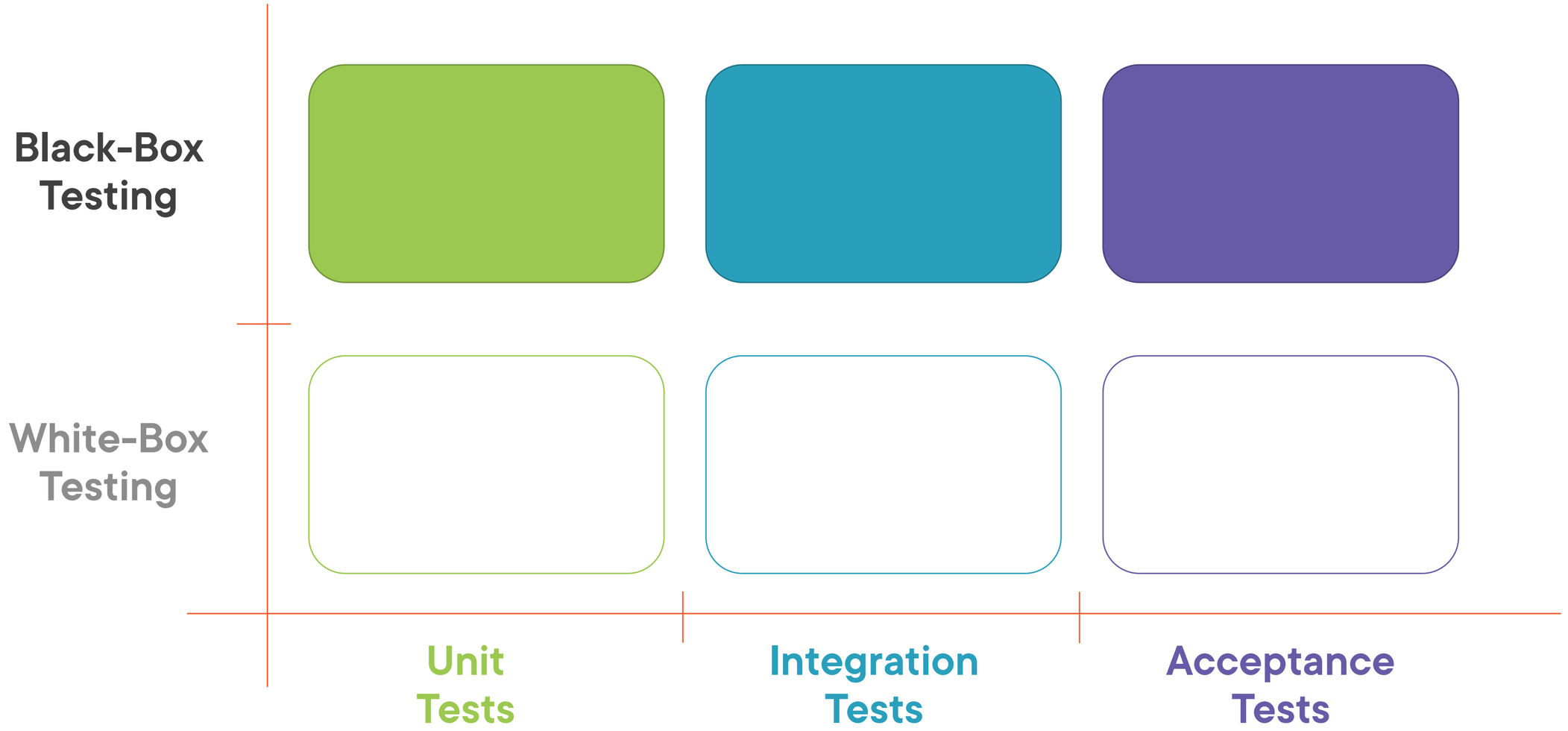
Testing Styles

Black Box Testing



White Box Testing




Black-Box Testing
White-Box Testing
Unit Tests
Integration Tests
Acceptance Tests

Many Other Types of Testing

Penetration Testing

Boundary Testing

Fuzz Testing

Smoke Testing

Stress Testing

A/B Testing

Testing Frameworks and Tools

xUnit Frameworks

SUnit (Smalltalk)

JUnit (Java)

NUnit **RUnit** **CppUnit** **EUnit** **PerlUnit** **PHPUnit** **xUnit.net**

Mocha **AVA** **py.test** **minitest** **FsTest**

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

User Interface Frameworks

Selenium

Watir

cypress.io

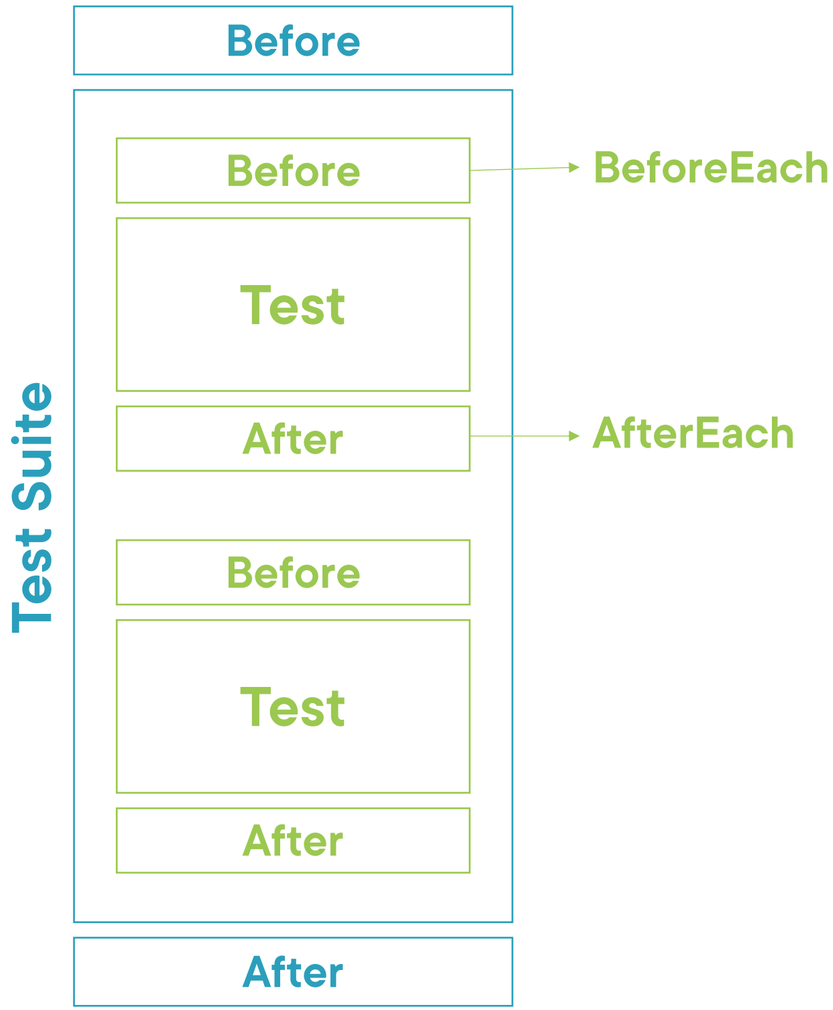
Visual Studio Coded UI Test
(Microsoft)

Test Studio
(Telerik)

Silk Test
(Micro Focus)

Testing Concepts

Test Concepts



Test

Before Test
After Test

Test Suite

Before Suite
After Suite

Verification Concepts

Assert

```
Assert.IsTrue(someBoolean);
Assert.IsFalse(someBoolean);
```

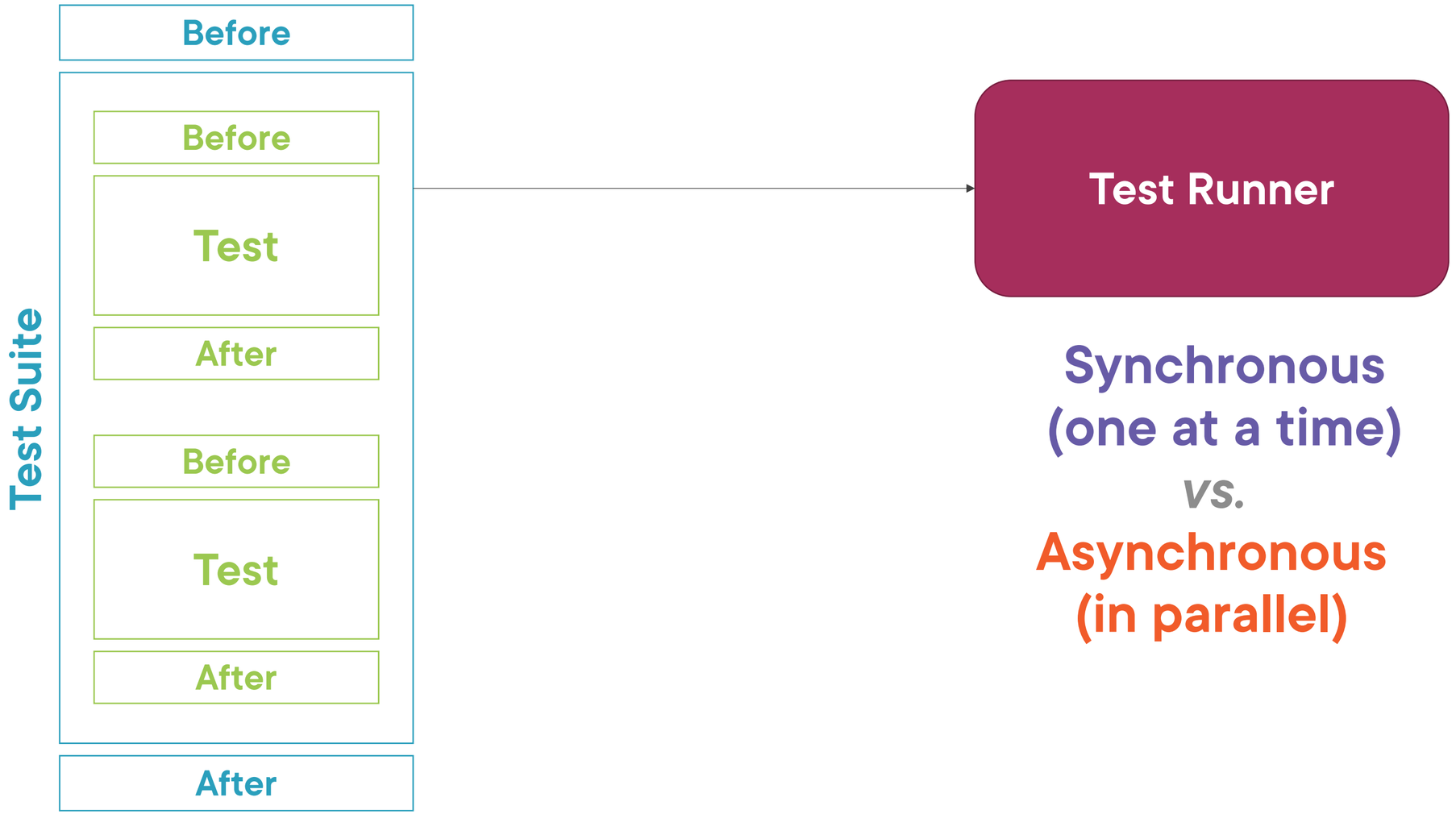
```
Assert.IsNull(someValue);
```

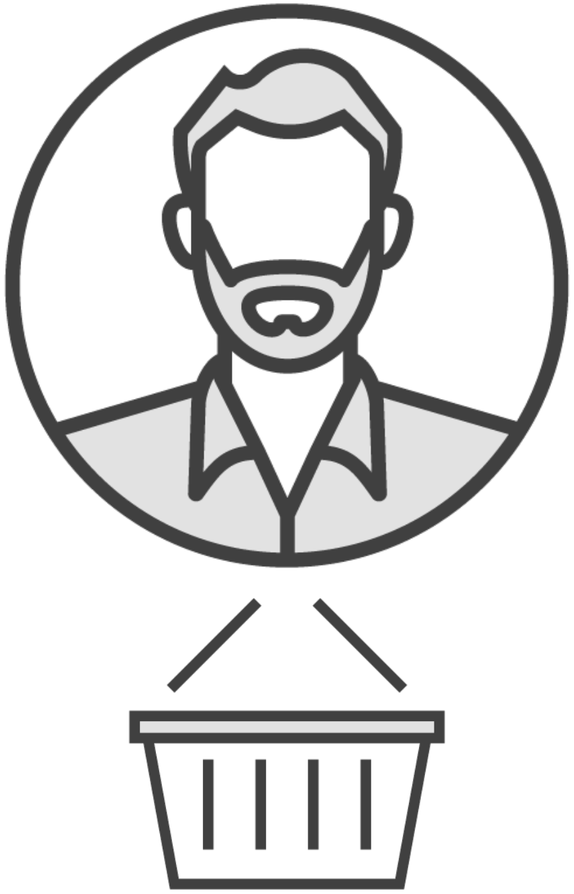
```
Assert.AreEqual(3, someValue);
```

```
Assert.Contains(obj, someCollection);
```

```
Assert.StartsWith("foo", someString);
```

Test Execution





User Item Suite

- Add Item to Cart
- Remove Item From Cart
- Change Item Quantity

```
myCart.Add(someItem);
Assert(myCart.Items.Length == 1);
```

```
myCart.Remove(someItem);
Assert(myCart.Items.Length == 0);
```

✓ Synchronous (one at a time)

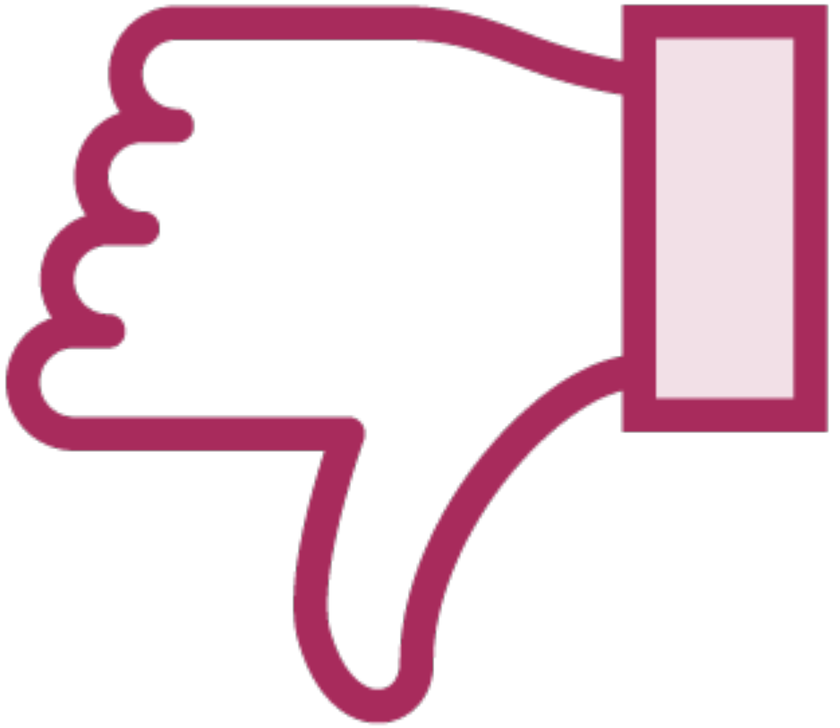
✗ Asynchronous (in parallel)

?

Test isolation is good!

Don’t be scared!

Insights from Testing

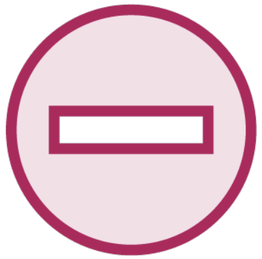


https://github.com/avajs/ava

How much of my code is reached by tests?

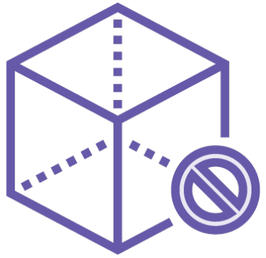
Are all my dependencies working?

Is my code written well?



Did any previously working features break?

How does the new code perform under load?



Were there breaking changes that can stop partners' code from working?

Summary

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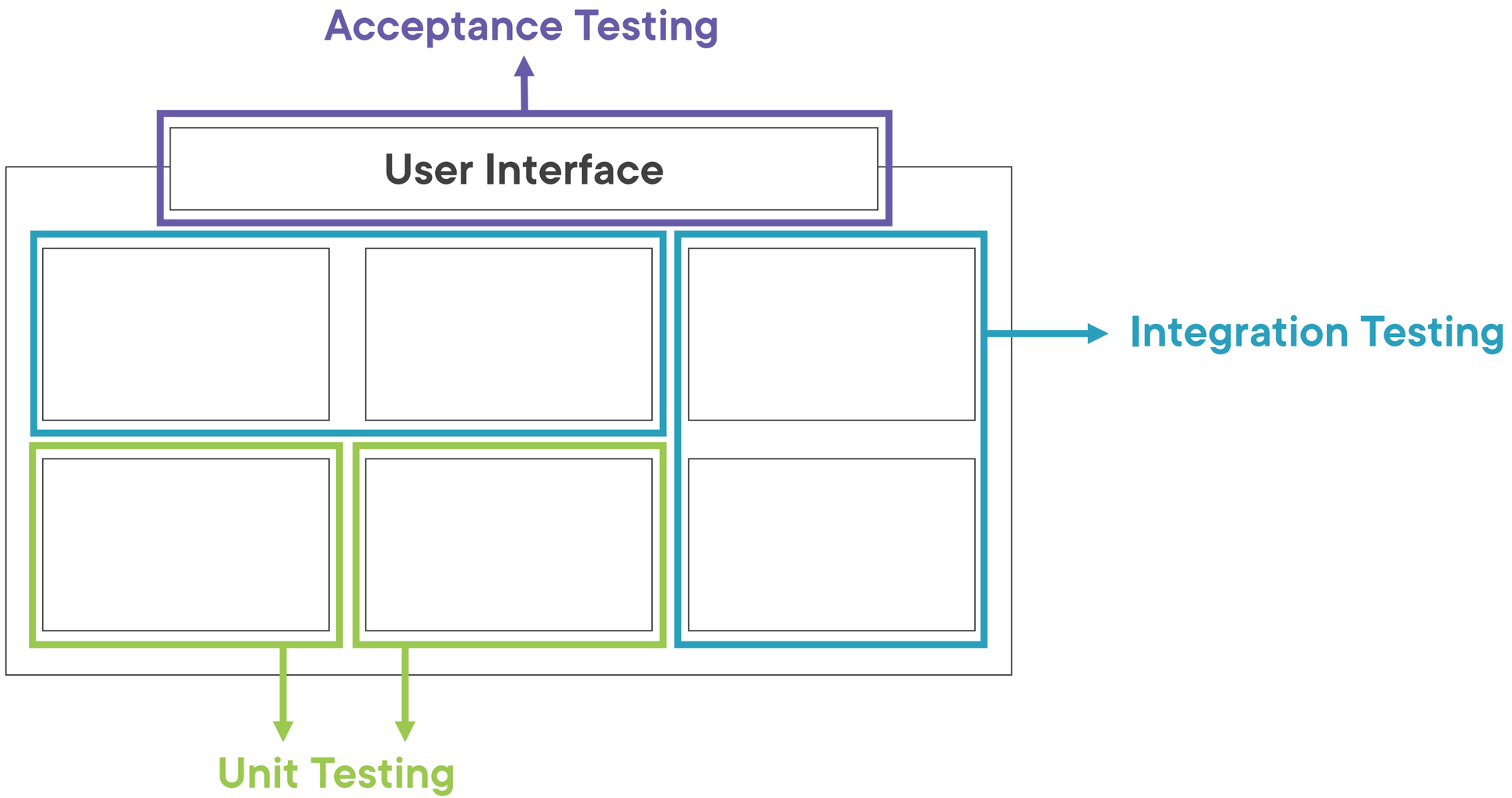
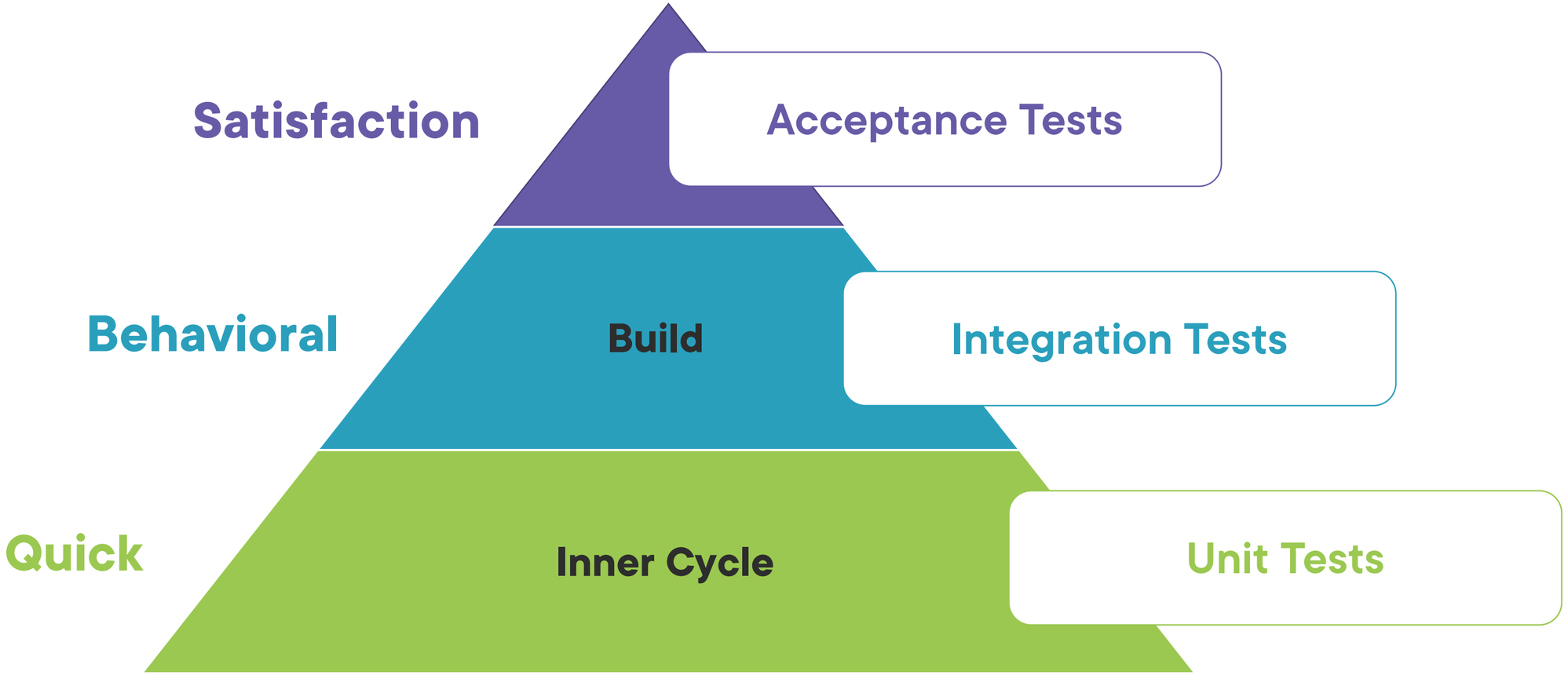
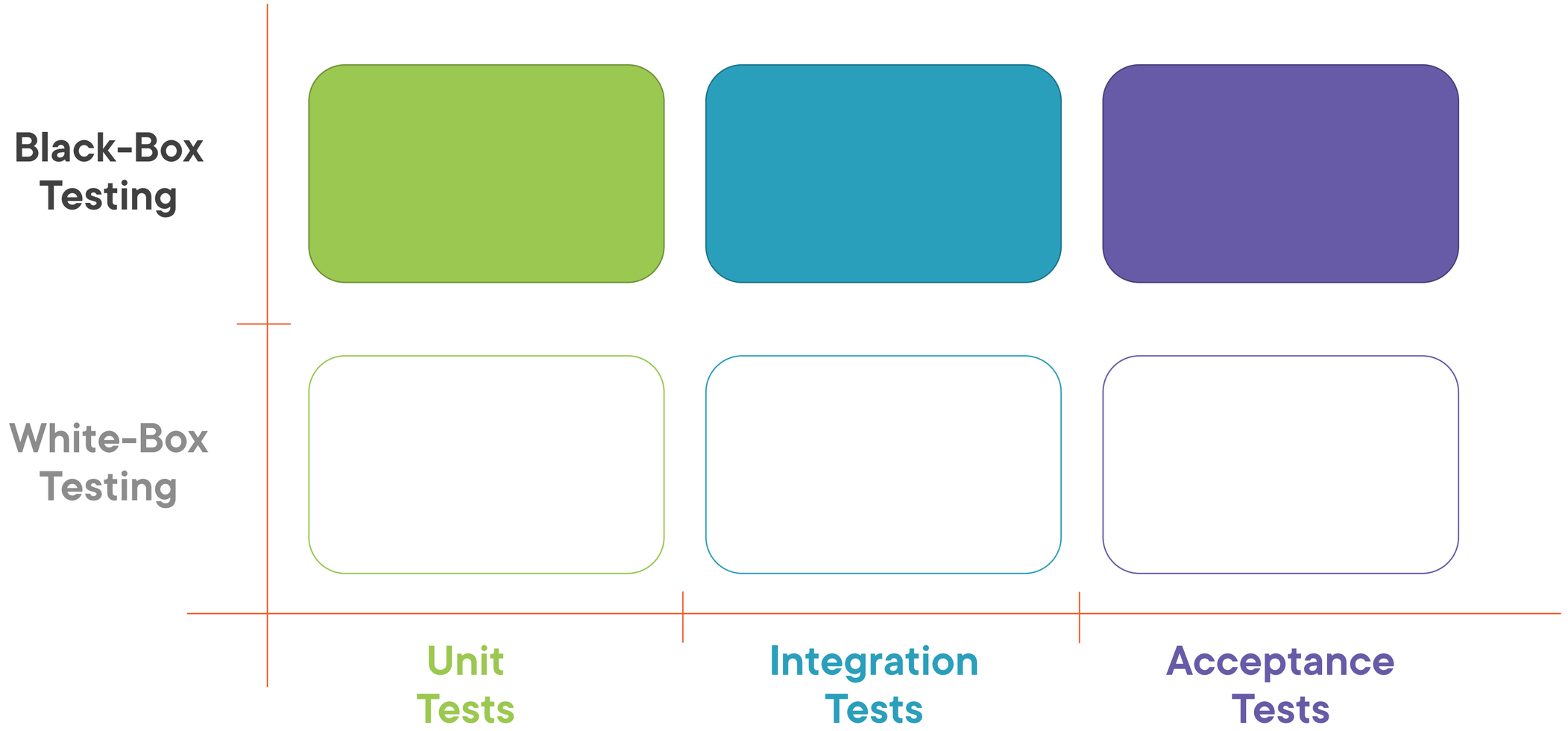
Software Testing



Balanced Testing

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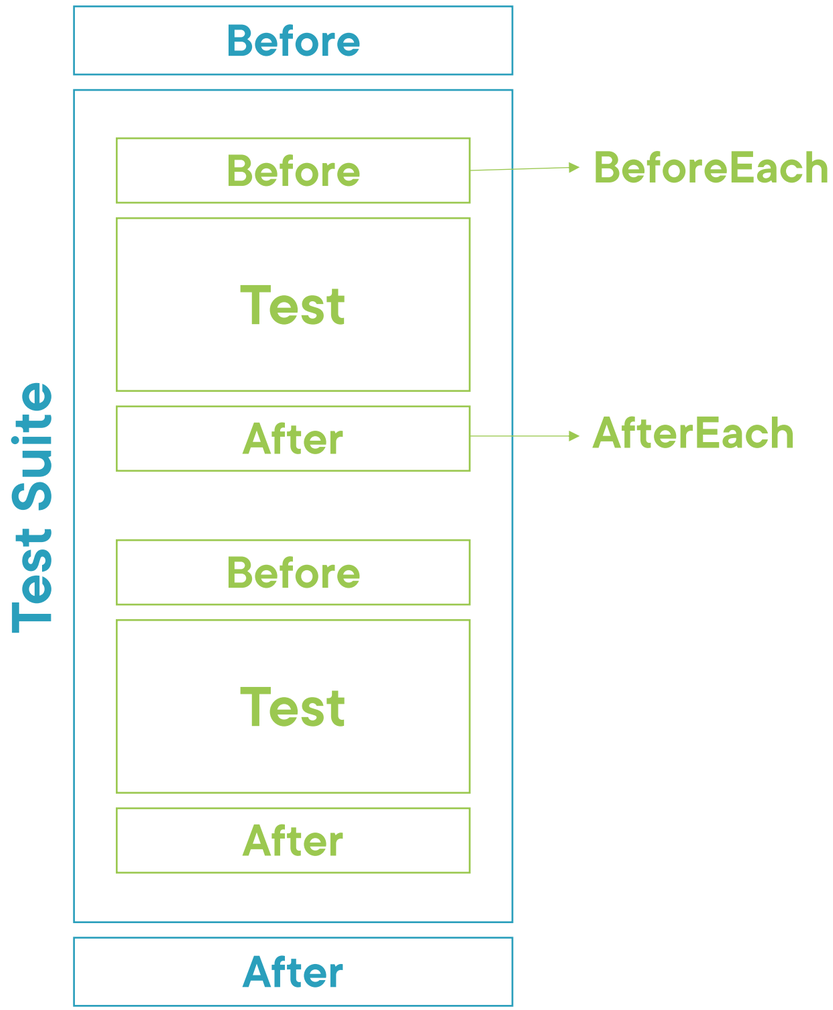

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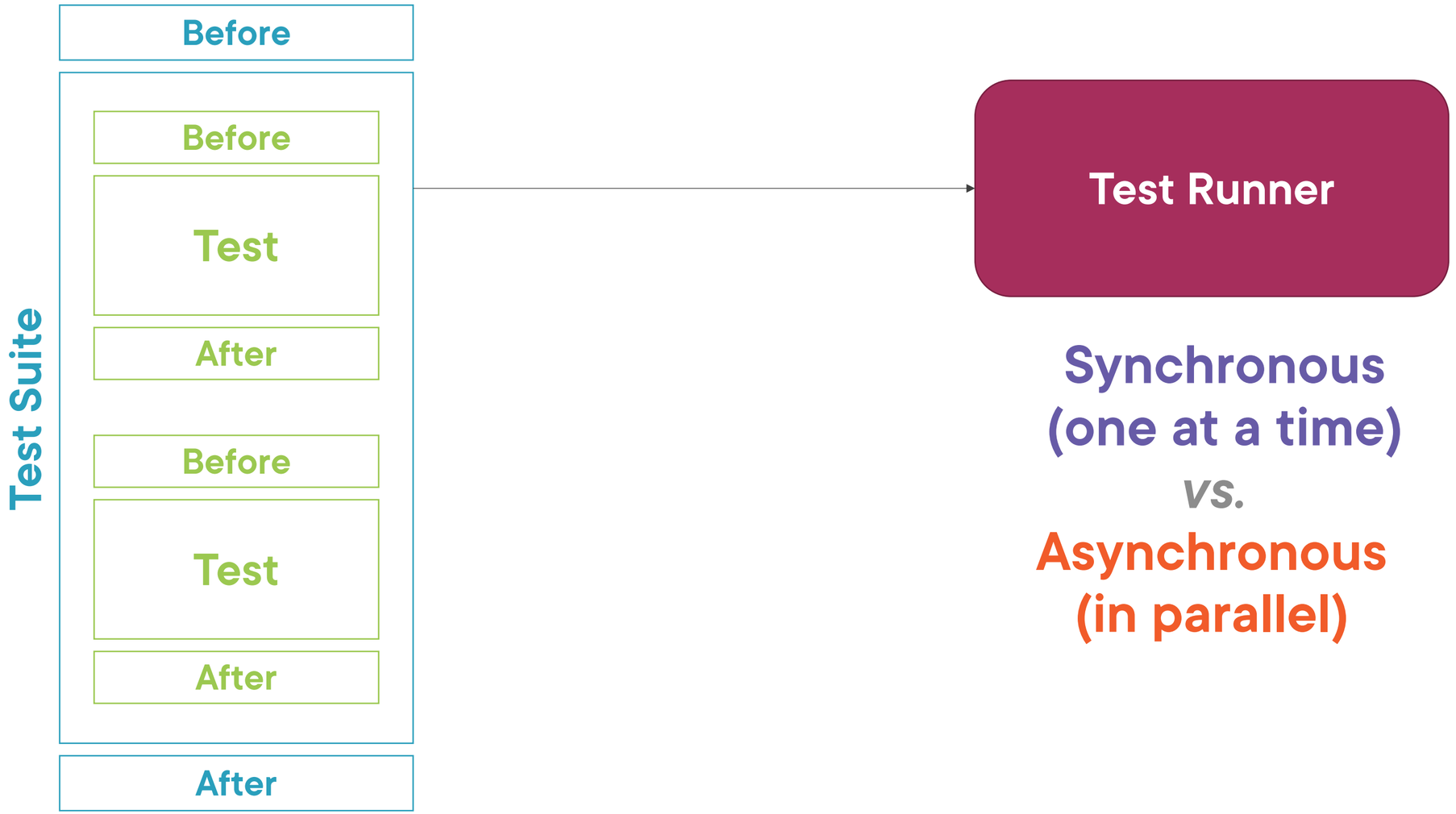

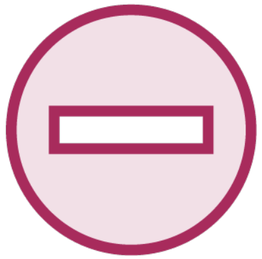

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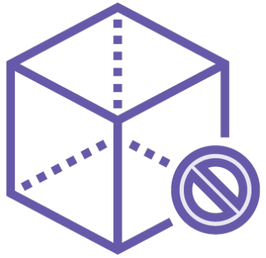

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