Comparing Test Types

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TEST AUTOMATION
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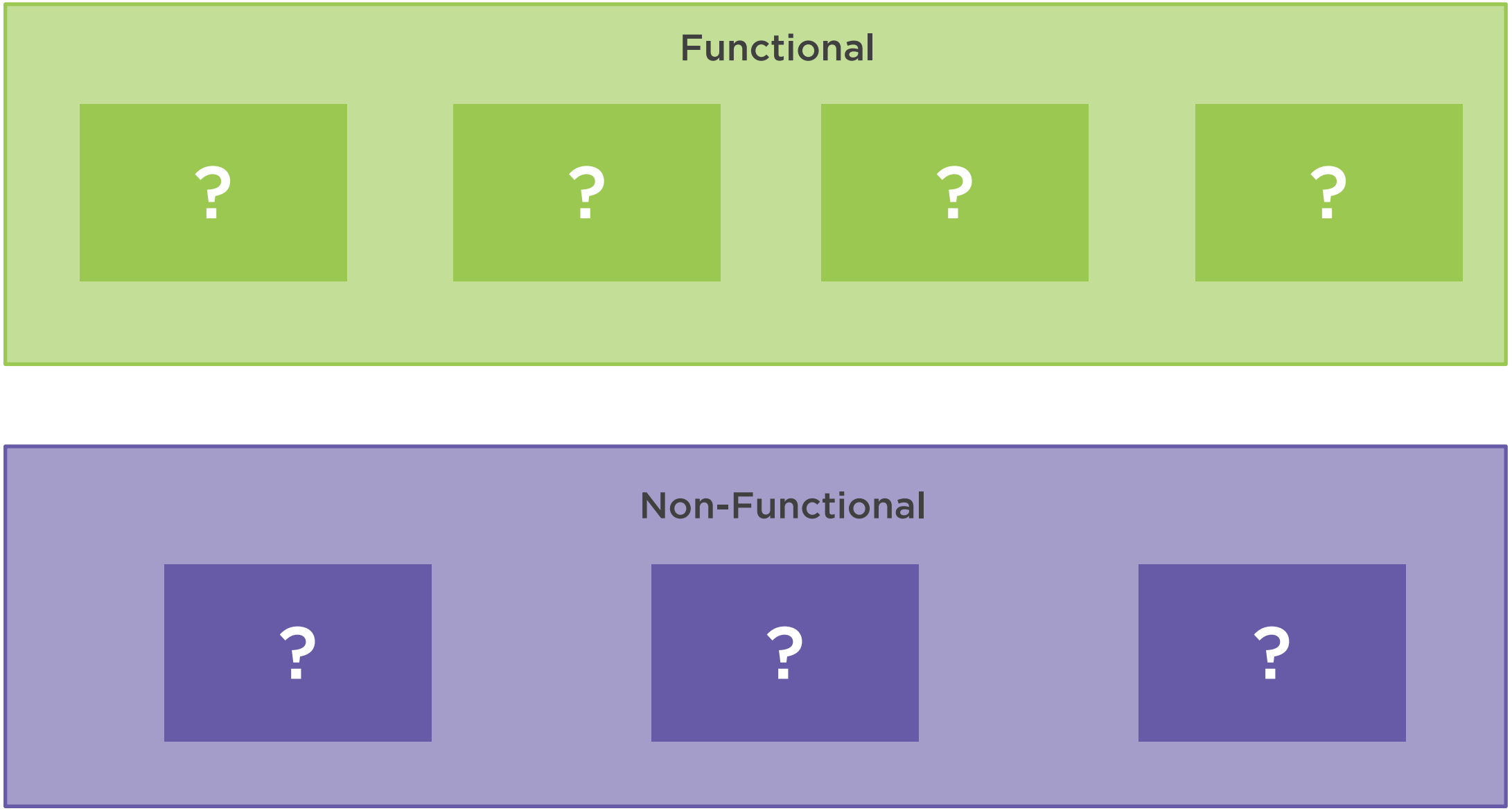
Test Type

A group of test activities aimed at testing specific characteristics of a software system

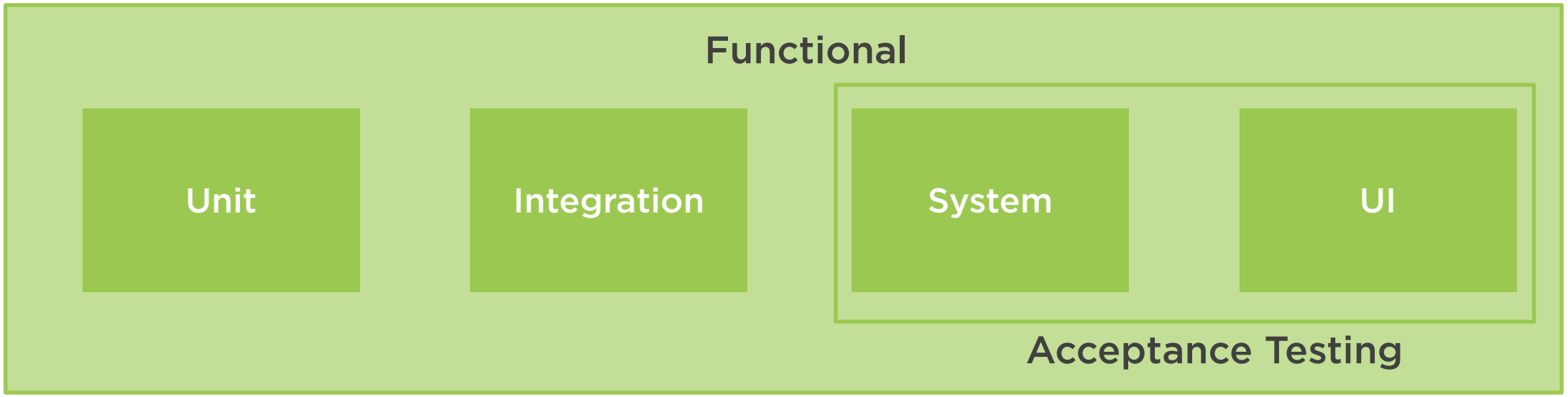

Functional
?
?
?
?
Non-Functional
?
?
?

Overview

- Functional vs. non-functional testing
- Black-box vs. white-box testing
- Change-related testing
- Test types and test levels

Does this feature function correctly?

Does it work as expected?

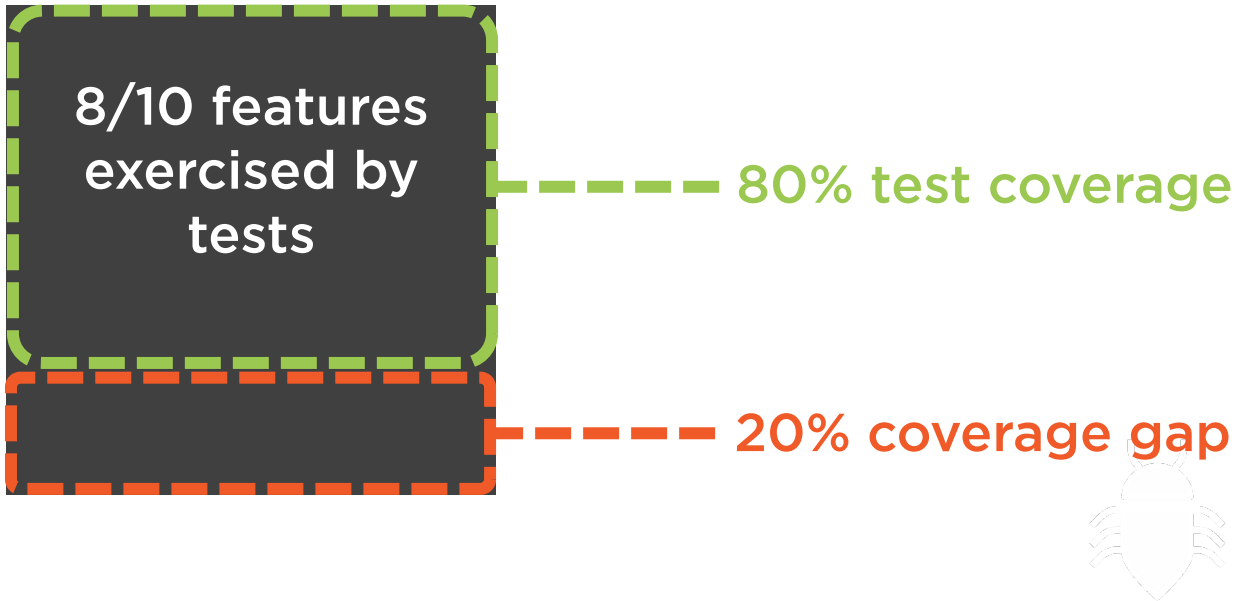

Functional
Unit
Integration
System
UI
Acceptance Testing

Functional Coverage

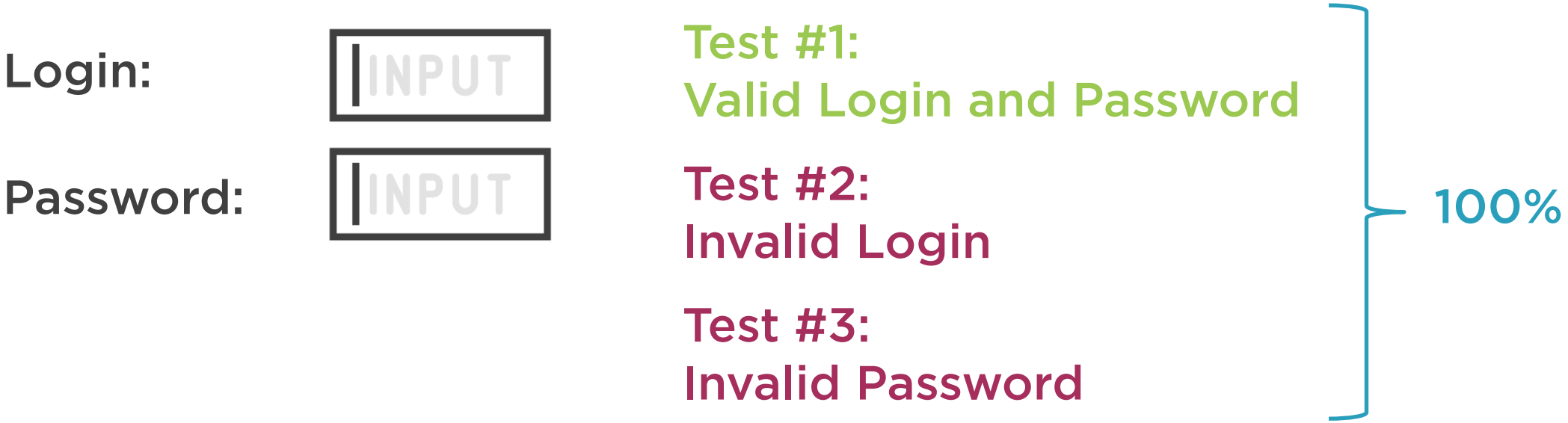
Coverage Gap

Coverage

The degree to which an application is exercised by tests expressed as a percentage


8/10 features exercised by tests
80% test coverage
20% coverage gap

Login:
INPUT
Password:
INPUT
Test #1:
Valid Login and Password
100%


Login:
INPUT
Password:
INPUT
Test #1:
Valid Login and Password
Test #2:
Invalid Login
Test #3:
Invalid Password
100%

App

```
if(age < 18){
    rejectApplication();
} else {
    // more logic
}
```

Tests

```
@Test
apply(17);
// verify rejection

@Test
apply(18);
// verify success
```

Does the system work properly for you?

Yes...

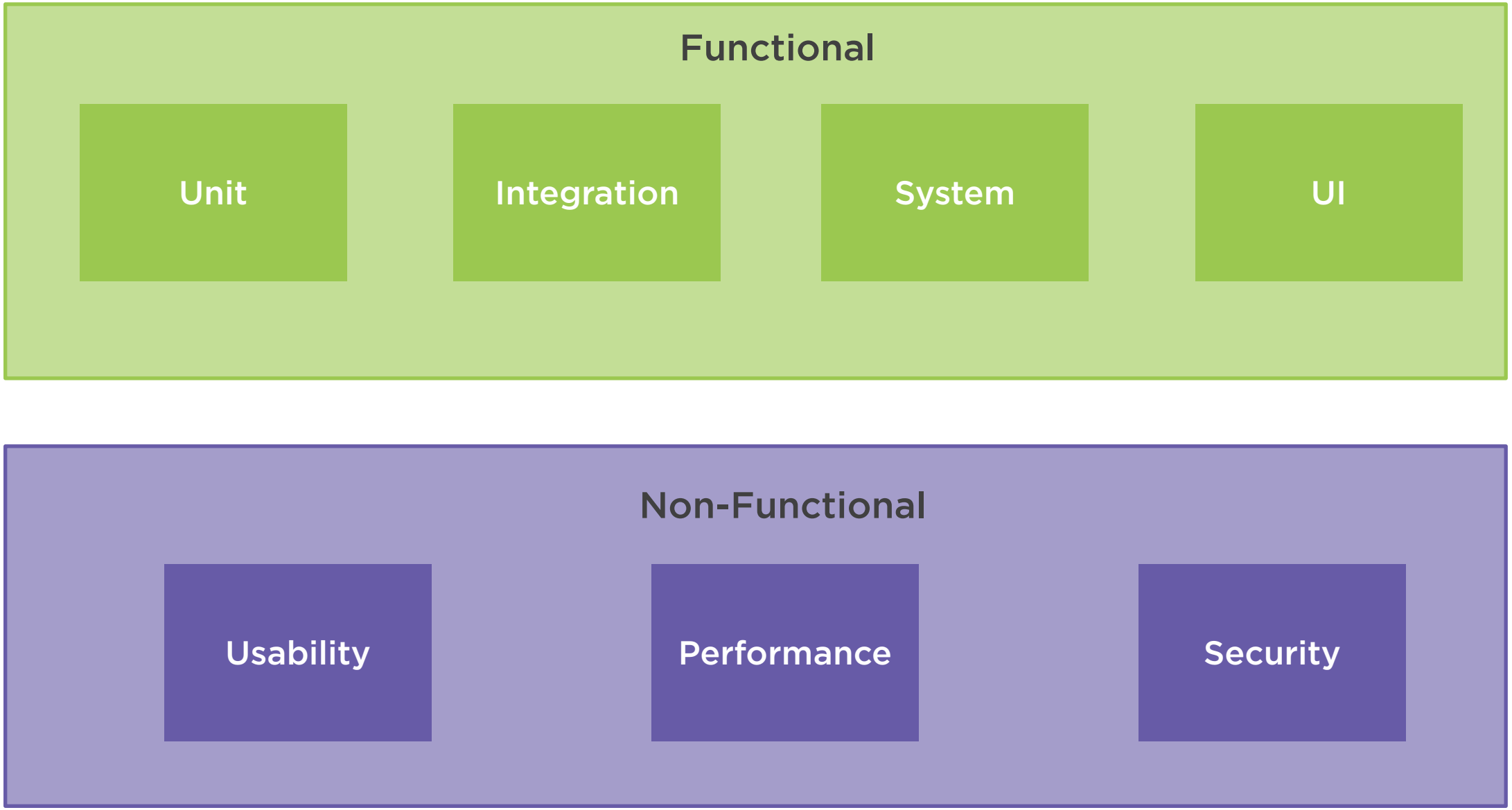
But it's really slow, and unintuitive...

and we've been hacked!

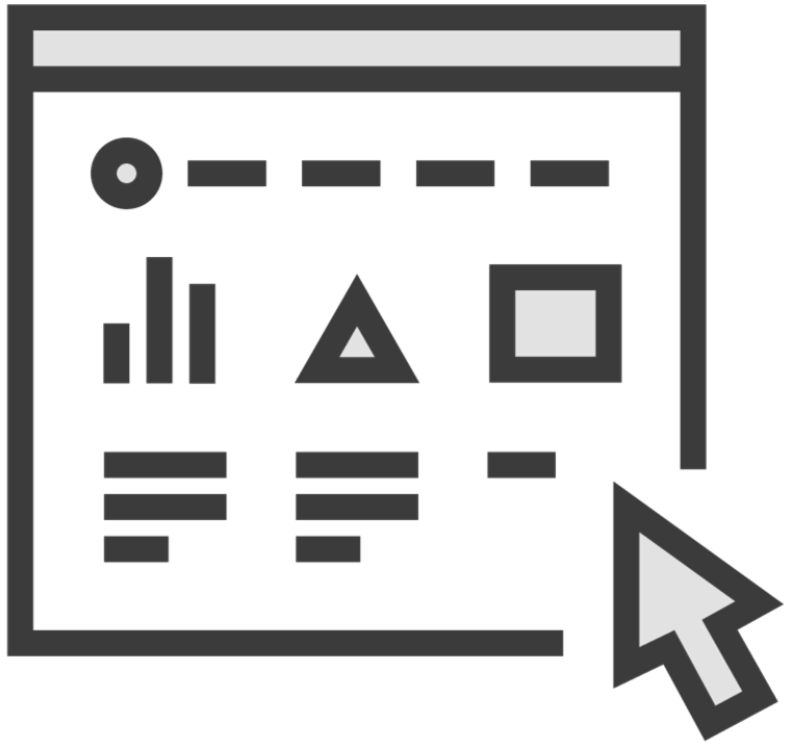
Non-functional Testing

Answers the "How?" questions:

- How well?
- How fast?
- How stable?
- How usable?
- How secure?


Functional
Unit
Integration
System
UI
Non-Functional
Usability
Performance
Security

Usability Testing



More than just “make the text on this button bigger”

May be achieved via alpha and beta testing

Performance Testing

Requires a different set of skills

A specialist area

Types:

- Stress Testing
- Load Testing
- Endurance Testing

Security Testing

Huge domain

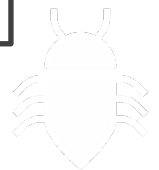
Also known as:

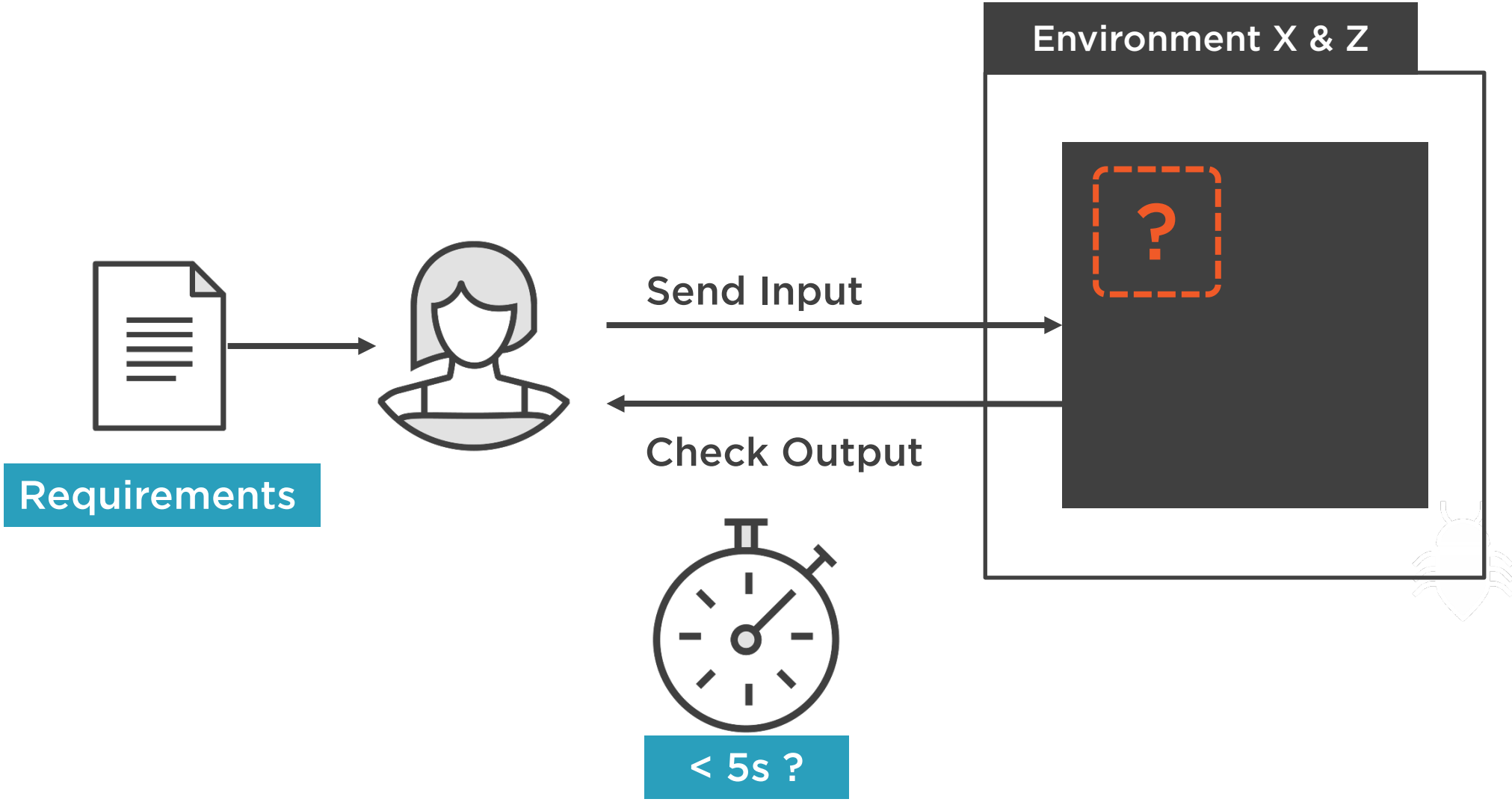
- Penetration Testing
- Ethical Hacking
- White-hat Hacking

A separate career path

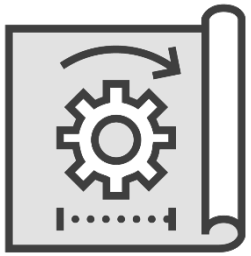
Black-box Testing

White-box Testing

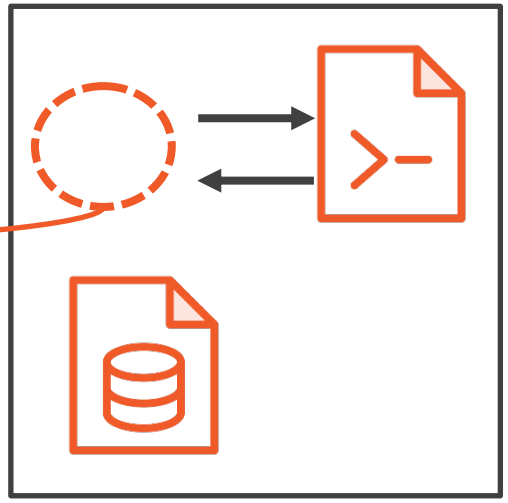


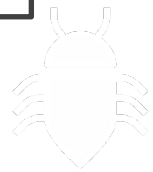

Environment X & Z
?
Send Input
Check Output
Requirements
< 5s ?

Requirements



Technical Spec





Unit testing

Functional testing

And many more...

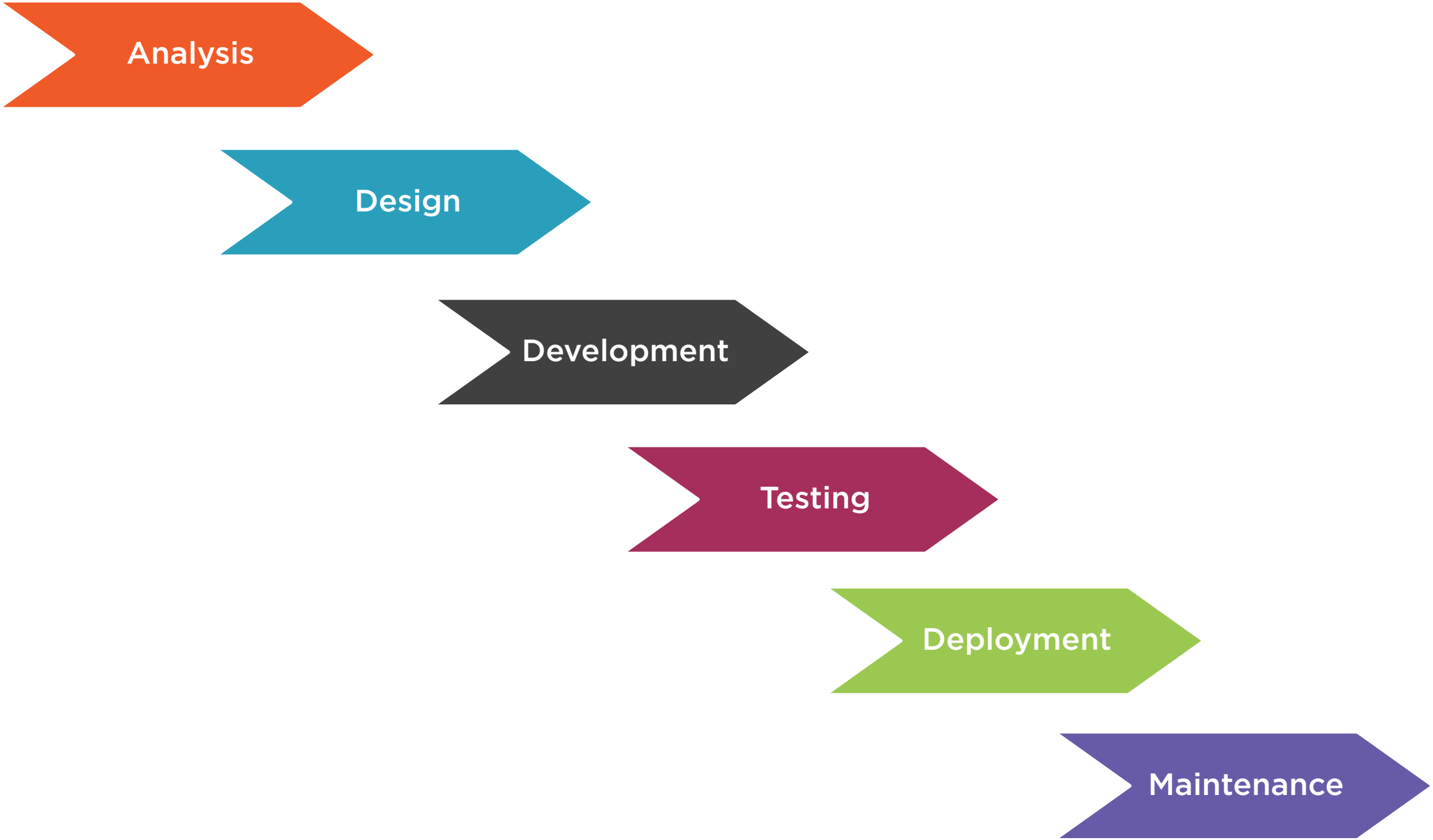
Performance testing

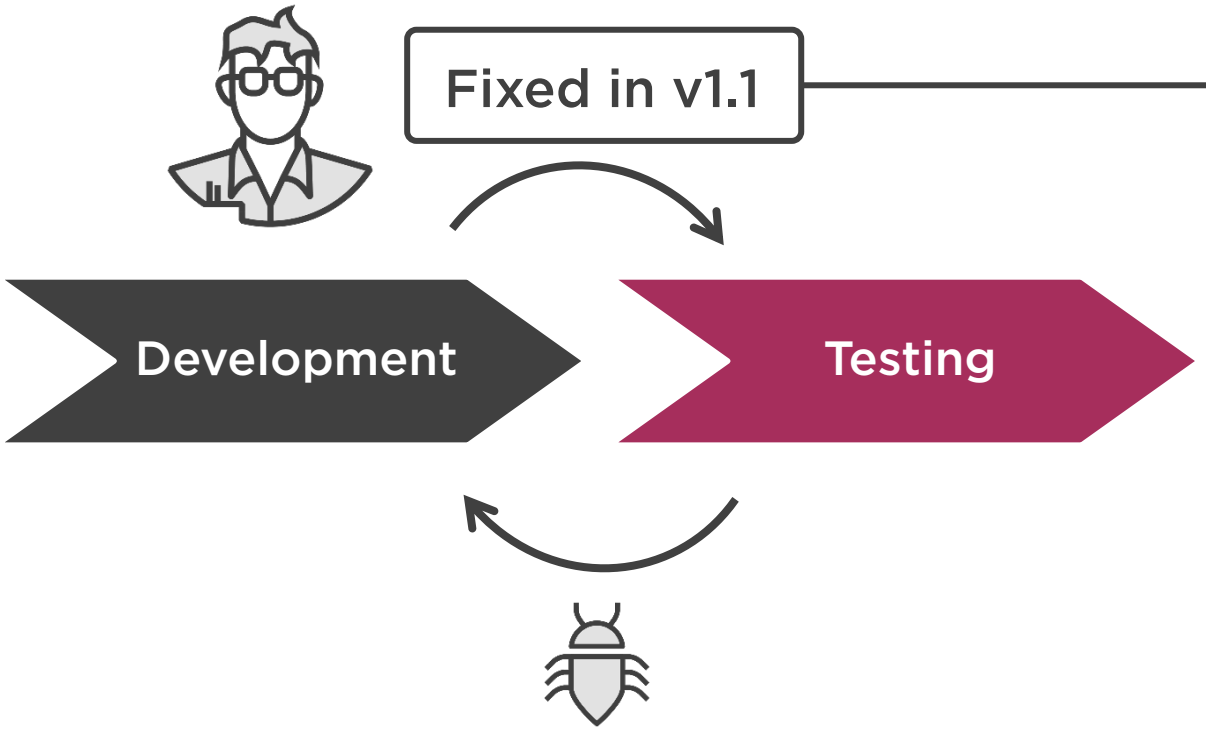
Integration testing

White-box testing

System testing

Change-related Testing


Analysis
Design
Development
Testing
Deployment
Maintenance



1) Confirmation Testing
2) Regression Testing

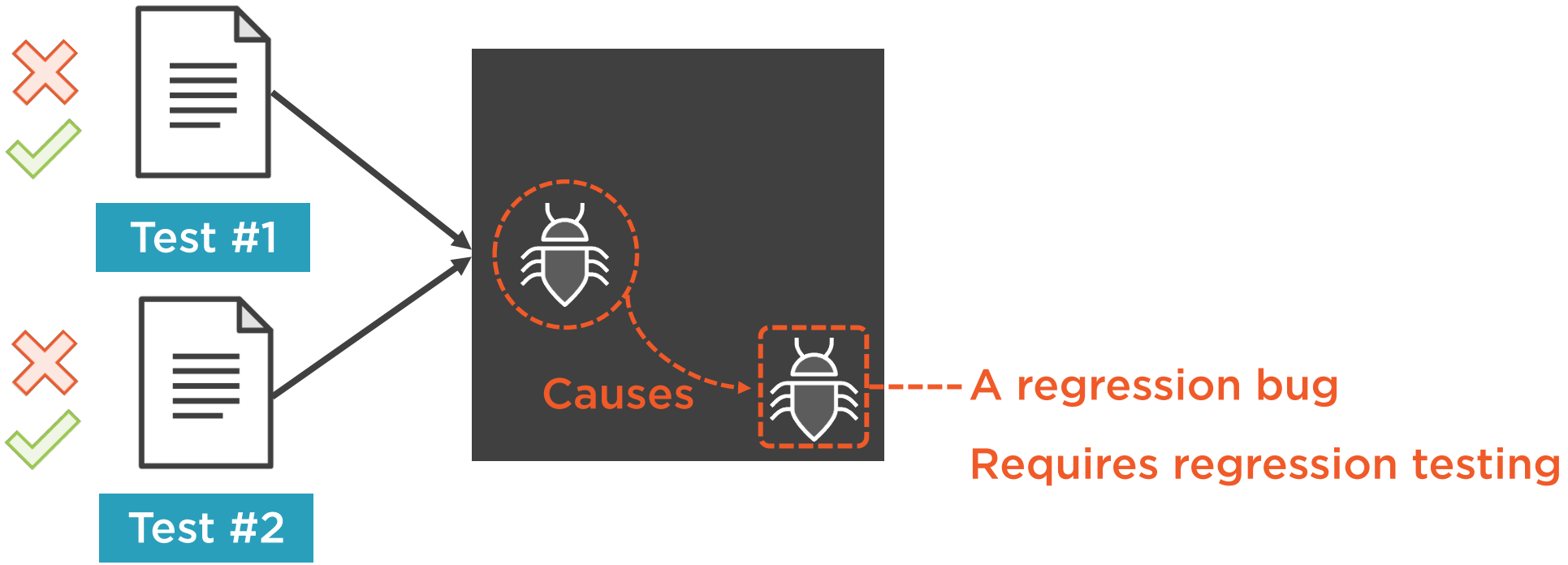
Change-related Testing

Confirmation Testing

Was the bug really fixed?

Regression Testing

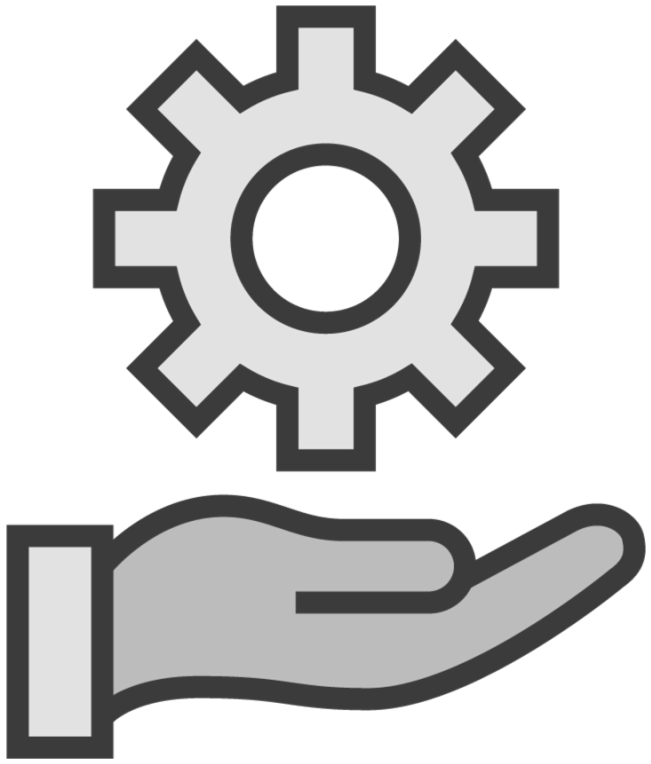
Did the fix (or a change) break anything else?


Test #1
Test #2
Causes
A regression bug
Requires regression testing

Regression

Any unintended side-effect caused by a change

Change Types



- Bug fix
- New features
- Change to existing features
- Configuration and environmental changes

I must retest everything again?!

Test #1

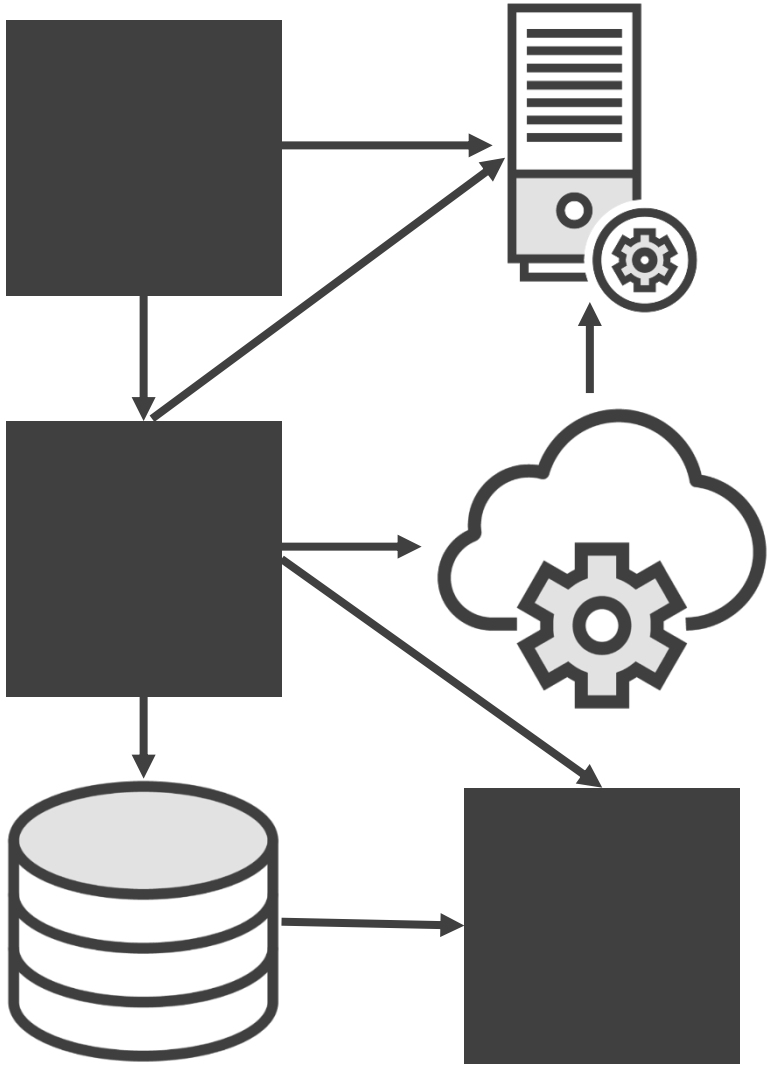
Test #2

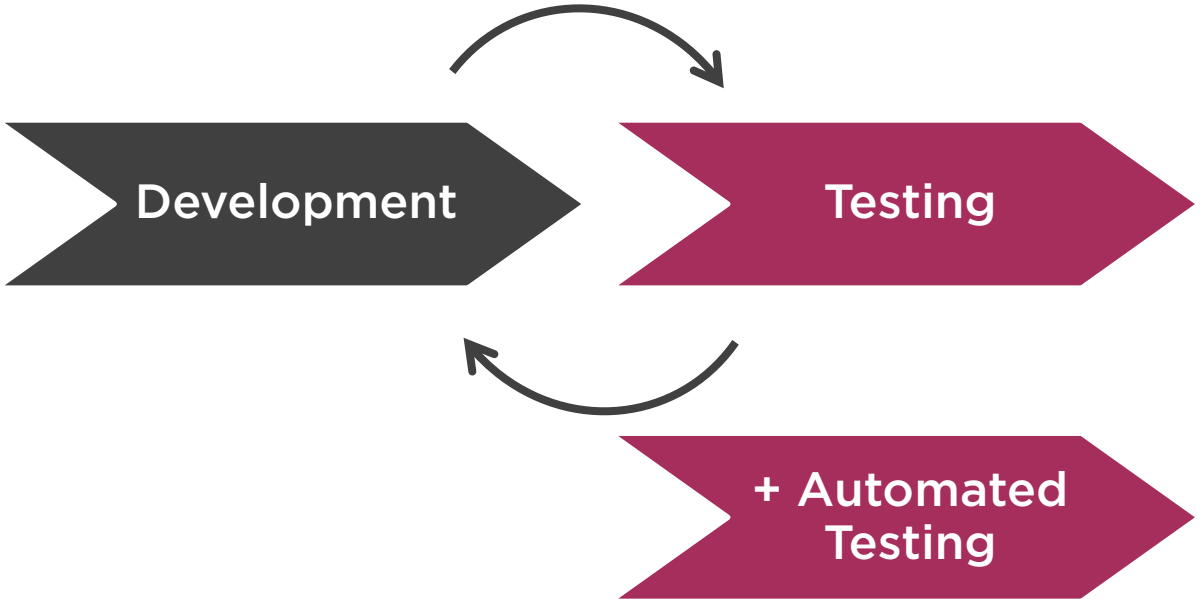
Test #3

Test #4

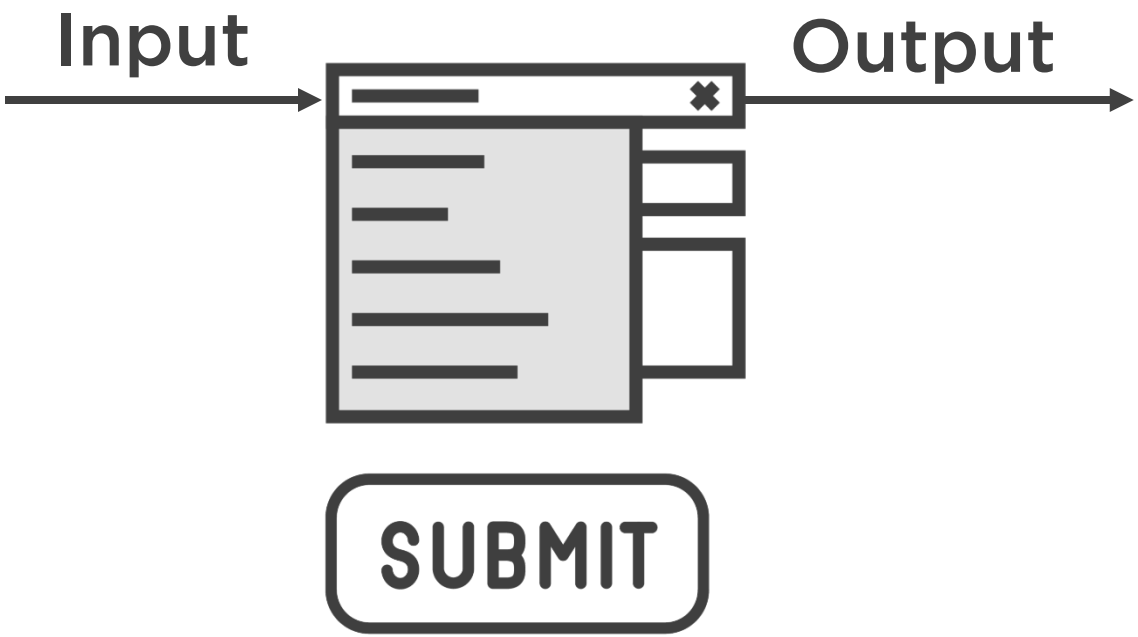
Test #5

Test #6





- Runs x100+ faster
- Prevents testing from becoming a bottleneck



Functional Testing?

Black-box Testing?

Confirmation Testing?

This OR that

Can be a mix

Functional Testing?

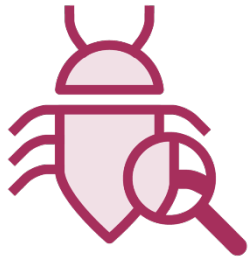
vs.

Black-box Testing?

vs.

Confirmation Testing?

Correct behavior?



Black-box

functional

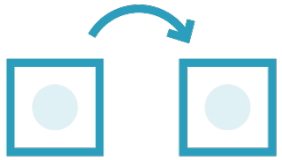
regression

testing

What are you doing?

What are you focusing on?

Confirmation testing



Integration testing

ISTQB:
You can do any test type at
any test level.

	Functional	Non-Functional		
		Performance	Security	Usability
Acceptance	Yes	Yes	Yes	Yes
System	Yes	Yes	Yes	Yes
Integration	Yes	Yes	Yes	Yes
Unit	Yes	Yes	Yes	Yes

	Functional	Non-Functional		
		Performance	Security	Usability
Acceptance	Yes	Yes	Yes	Yes
System	Yes	Yes	Yes	Yes
Integration	Yes	Yes	Yes	Yes
Unit	Yes	Yes (but rare)	Yes	Not really

		Functional	Non-Functional		
			Performance	Security	Usability
Black-box	**Acceptance**	Yes	Yes	Yes	Yes
	System	Yes	Yes	Yes	Yes
Both	**Integration**	Yes	Yes	Yes	Yes
White-box	**Unit**	Yes	Yes (but rare)	Yes	Not really

Summary

Test levels

ISTQB: Unit testing = module testing

Integration testing

System testing

- E2E
- F2B

Acceptance testing

Summary

- Functional vs. non-functional testing
- Other groupings exist
- White-box vs. black-box
- Regression and confirmation testing
- Test levels and test types are not mutually exclusive

Exploring Maintenance Testing