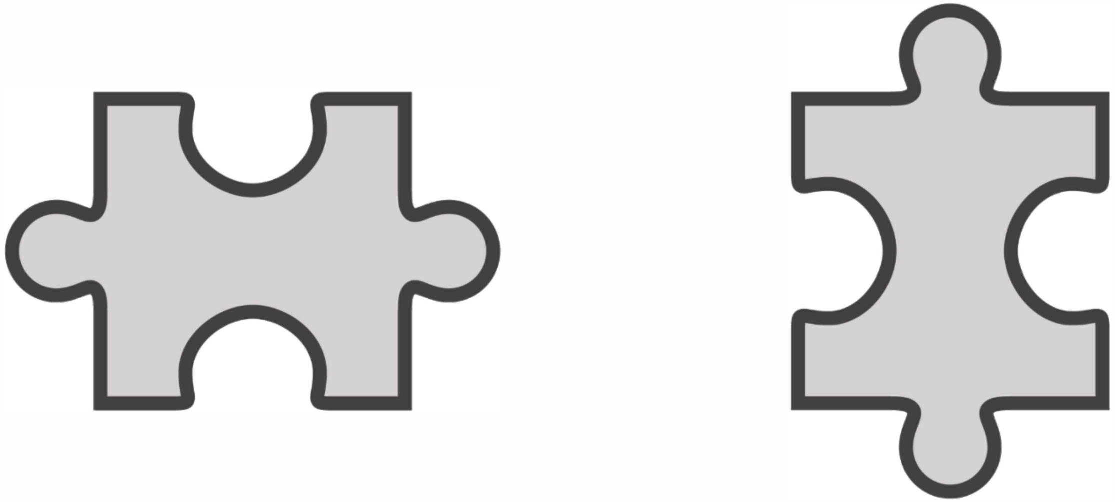
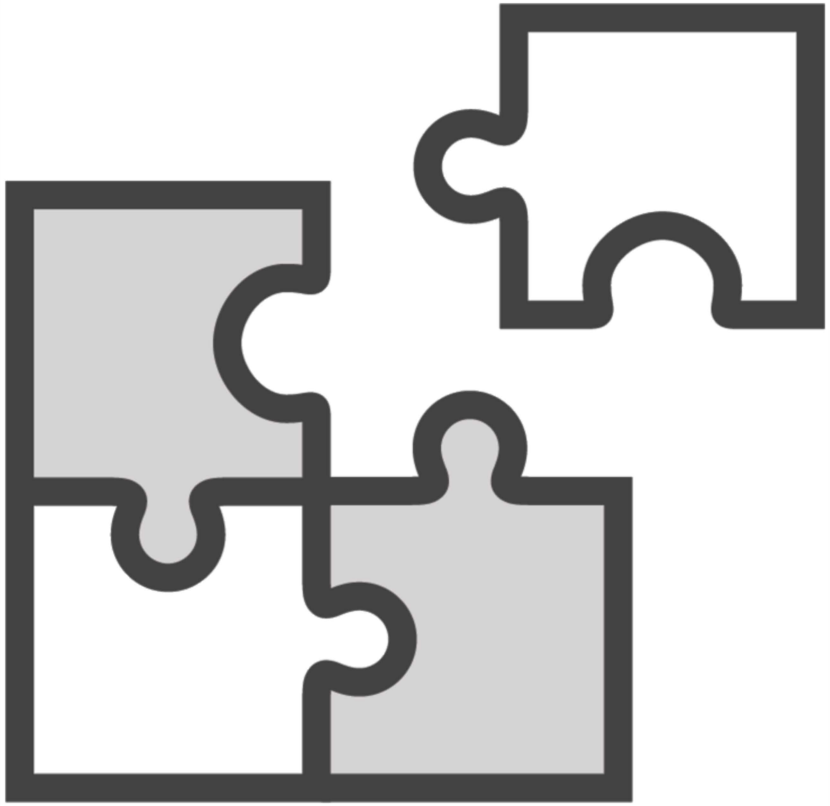
Discovering Test Levels

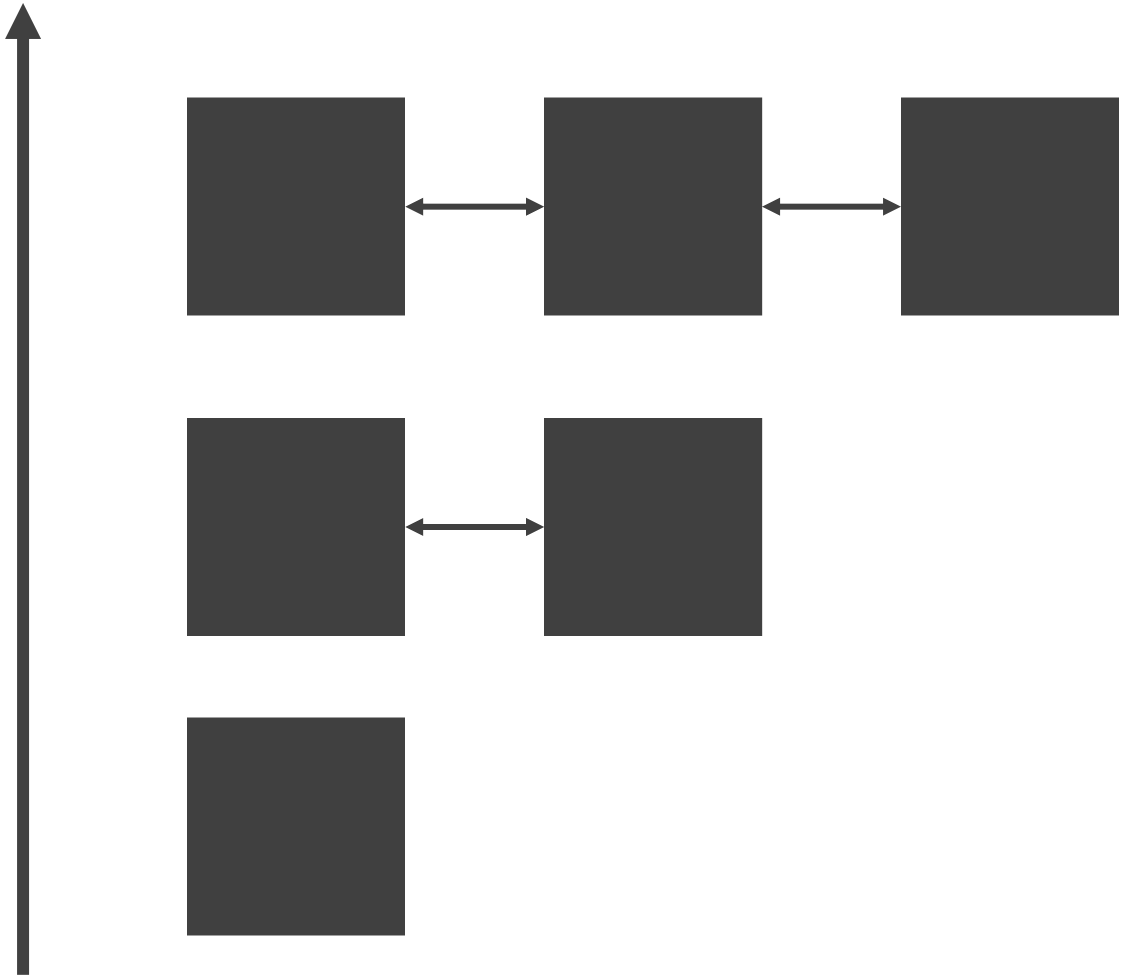
Yelena Gouralnik

TEST AUTOMATION
ENGINEER





Test Levels



Overview

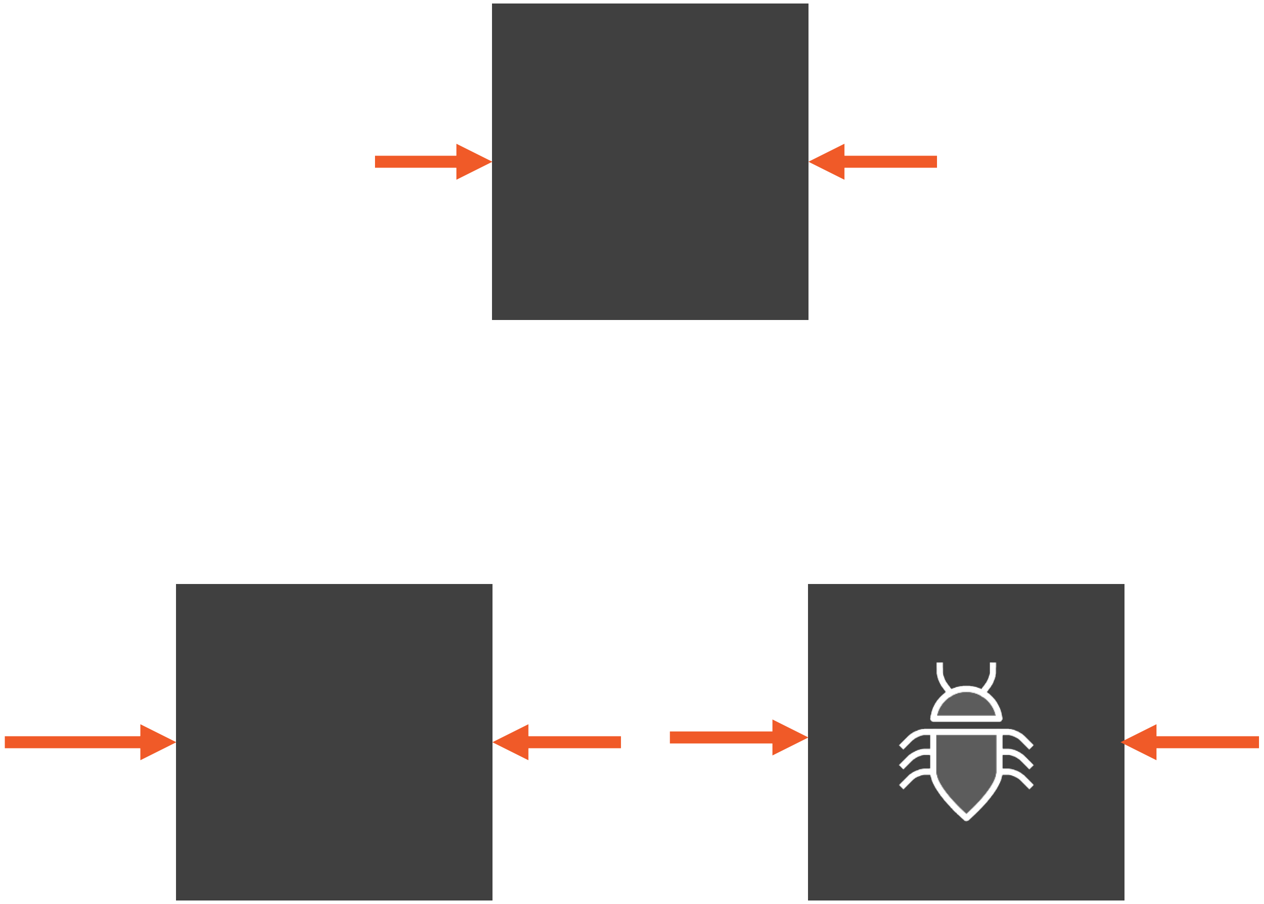
Four test levels:

- Component
- Integration
- System
- Acceptance

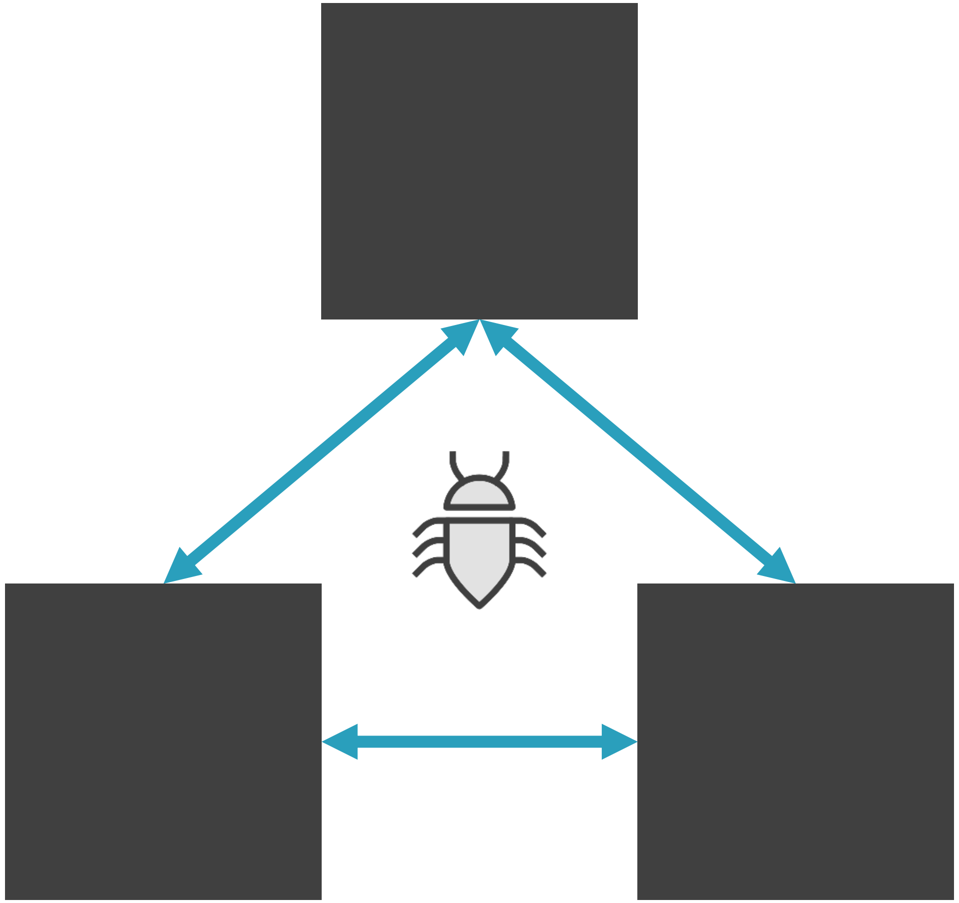
Official ISTQB and widely used alternative definitions

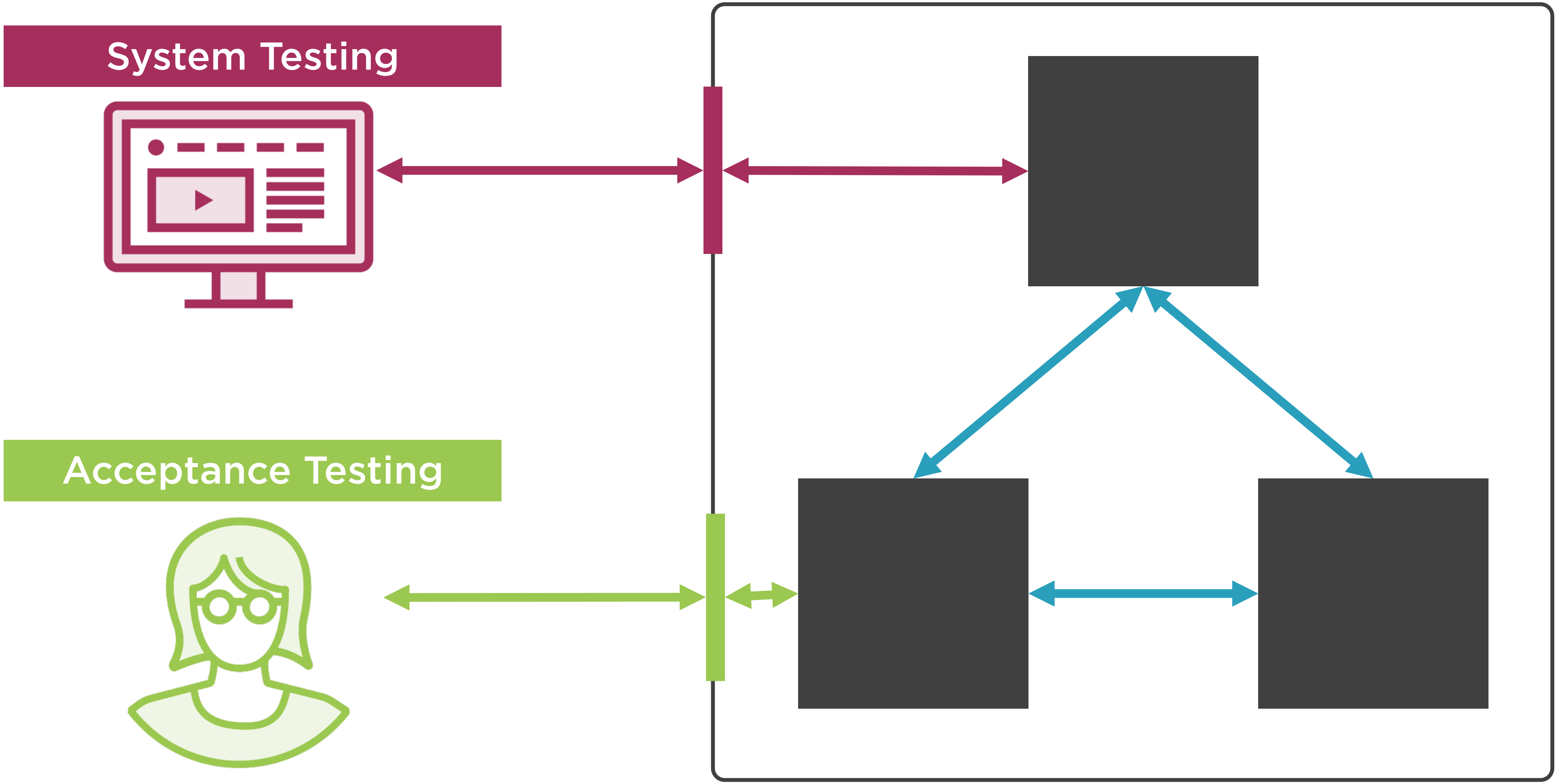
Test levels explanation in under 90 seconds.

Component Testing



Integration Testing





System Testing

Acceptance Testing

Who? For what purpose?

Common Objectives

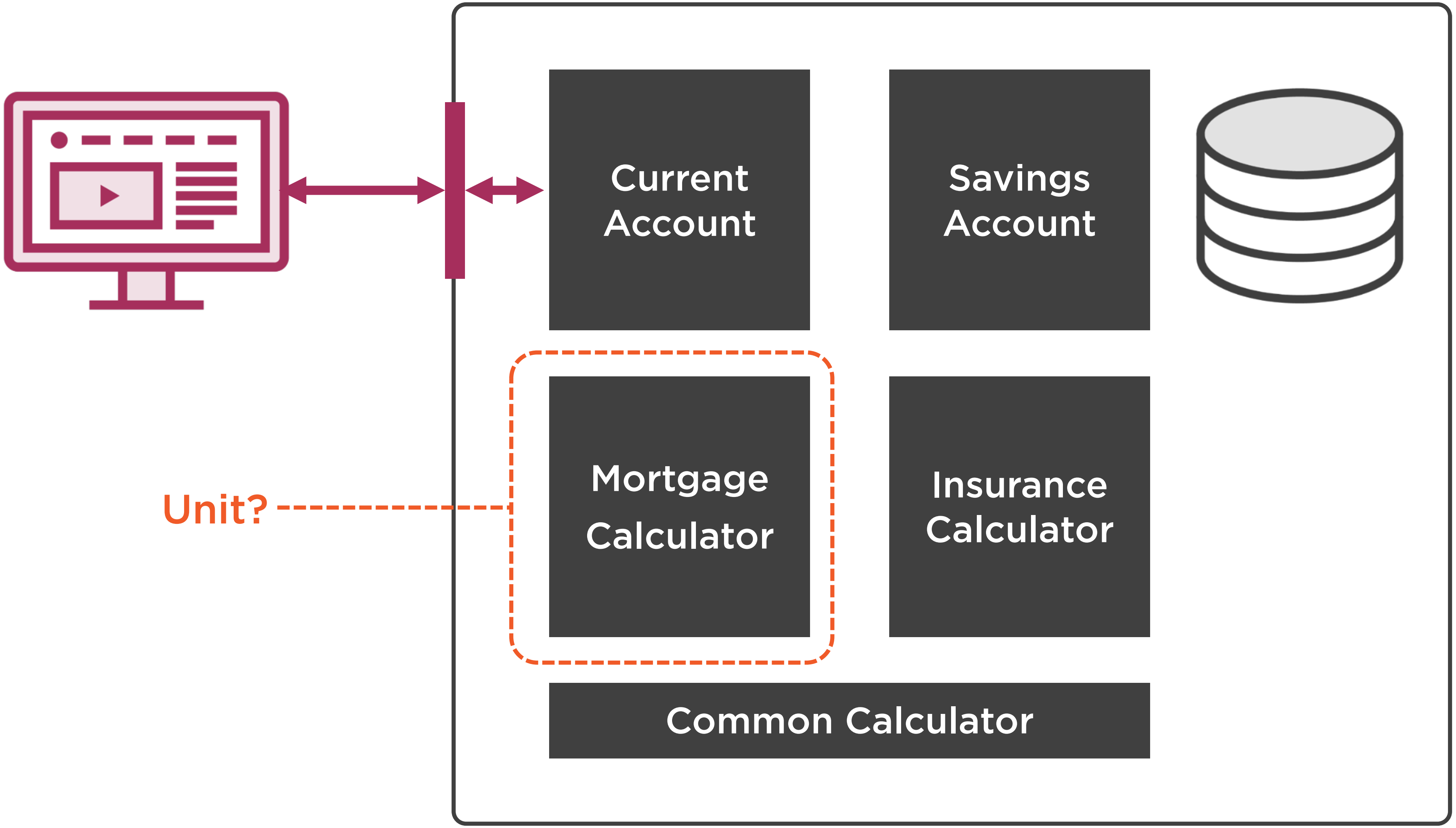
Reducing risk

Verifying functional and non-functional behaviors

Build confidence in the system

Find defects

Prevent defects from escaping to higher levels


Current Account
Savings Account
Unit?
Mortgage Calculator
Insurance Calculator
Common Calculator

Component Test Level

Component testing (also known as unit or module testing) focuses on components that are separately testable

Remember for the exam

What is a “unit” exactly?

How small?

Small. Can be tested independently.

Calculator

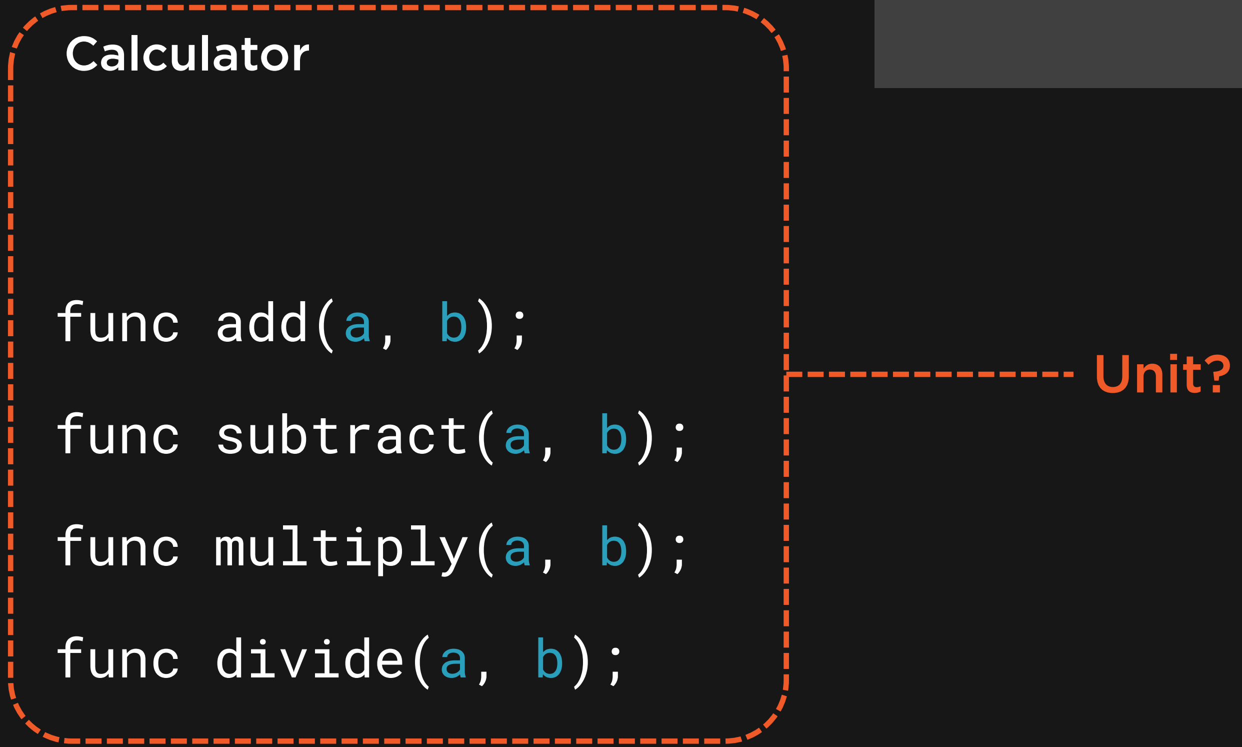
```
func add(a, b) {
  return a + b;
}
```

Unit?

Tests

```
assertTrue(add(1, 2) == 3);

assertTrue(add(5, 5) == 10);
```



Calculator

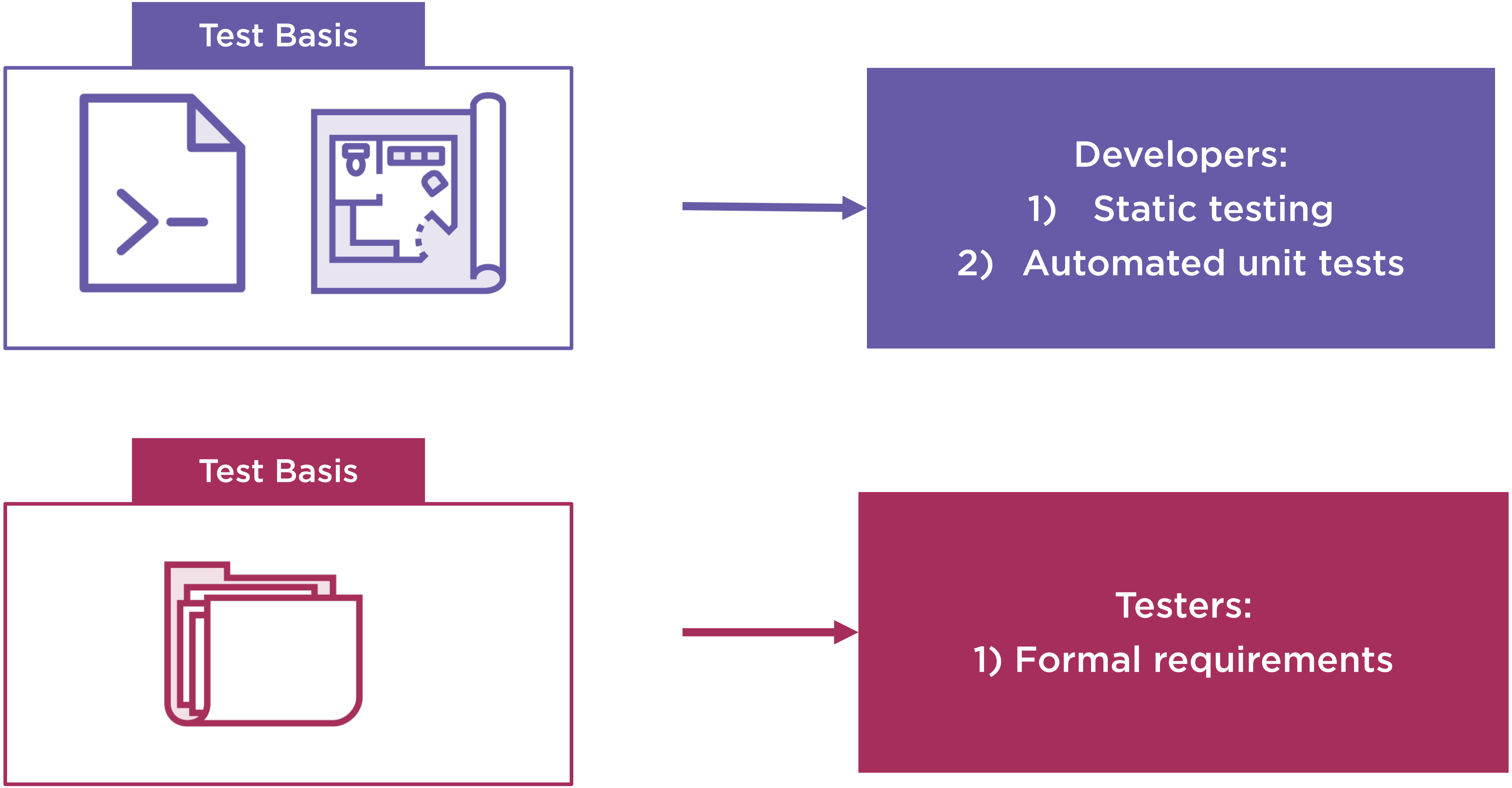
```
func add(a, b);

func subtract(a, b);

func multiply(a, b);

func divide(a, b);
```

Unit?



Test Basis

Developers:

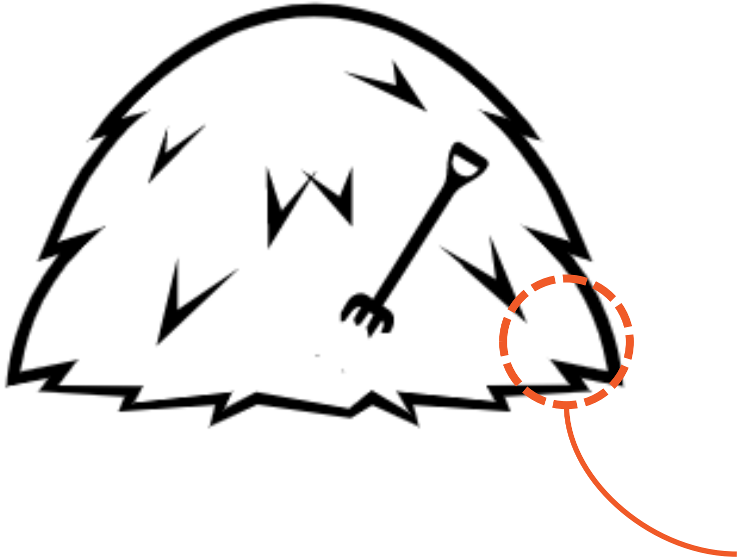
1) Static testing

2) Automated unit tests

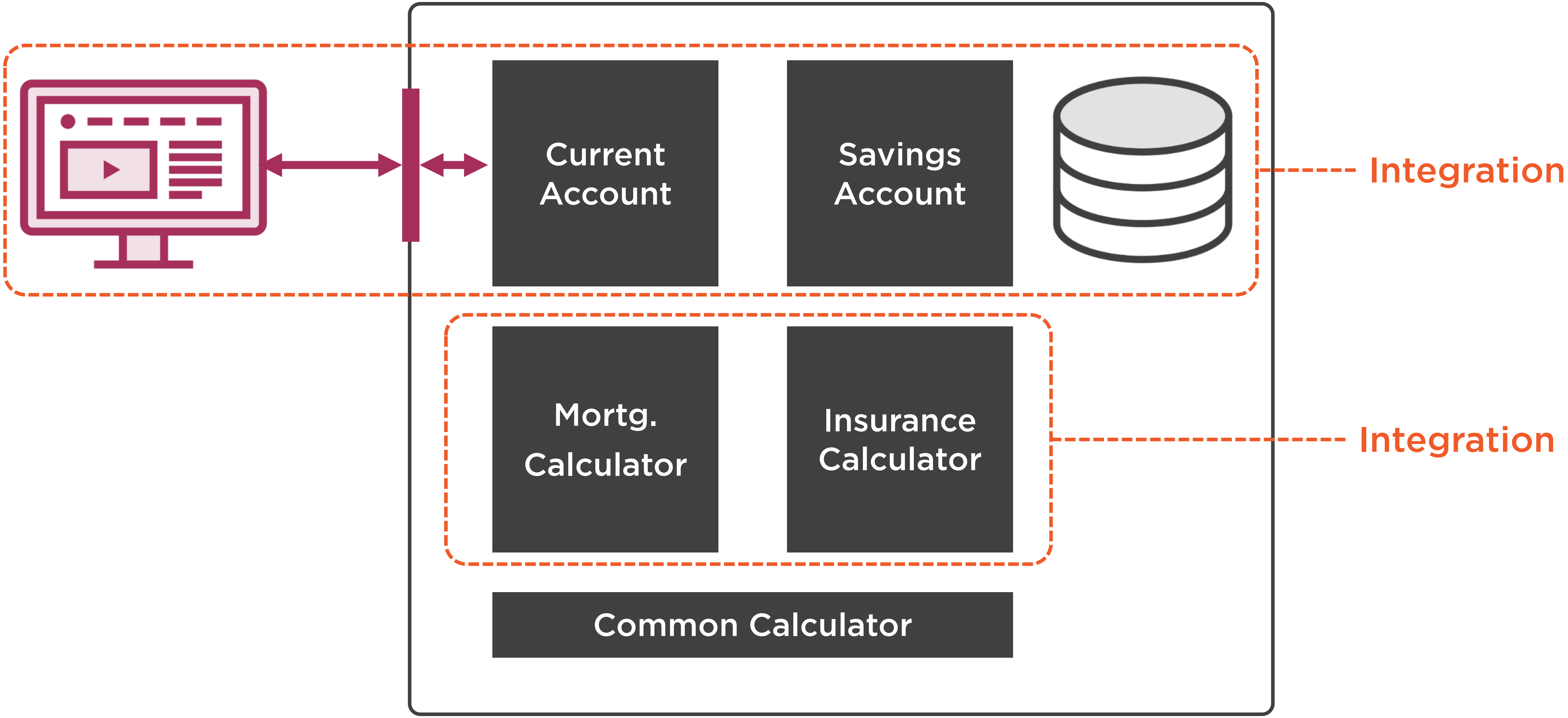
Test Basis

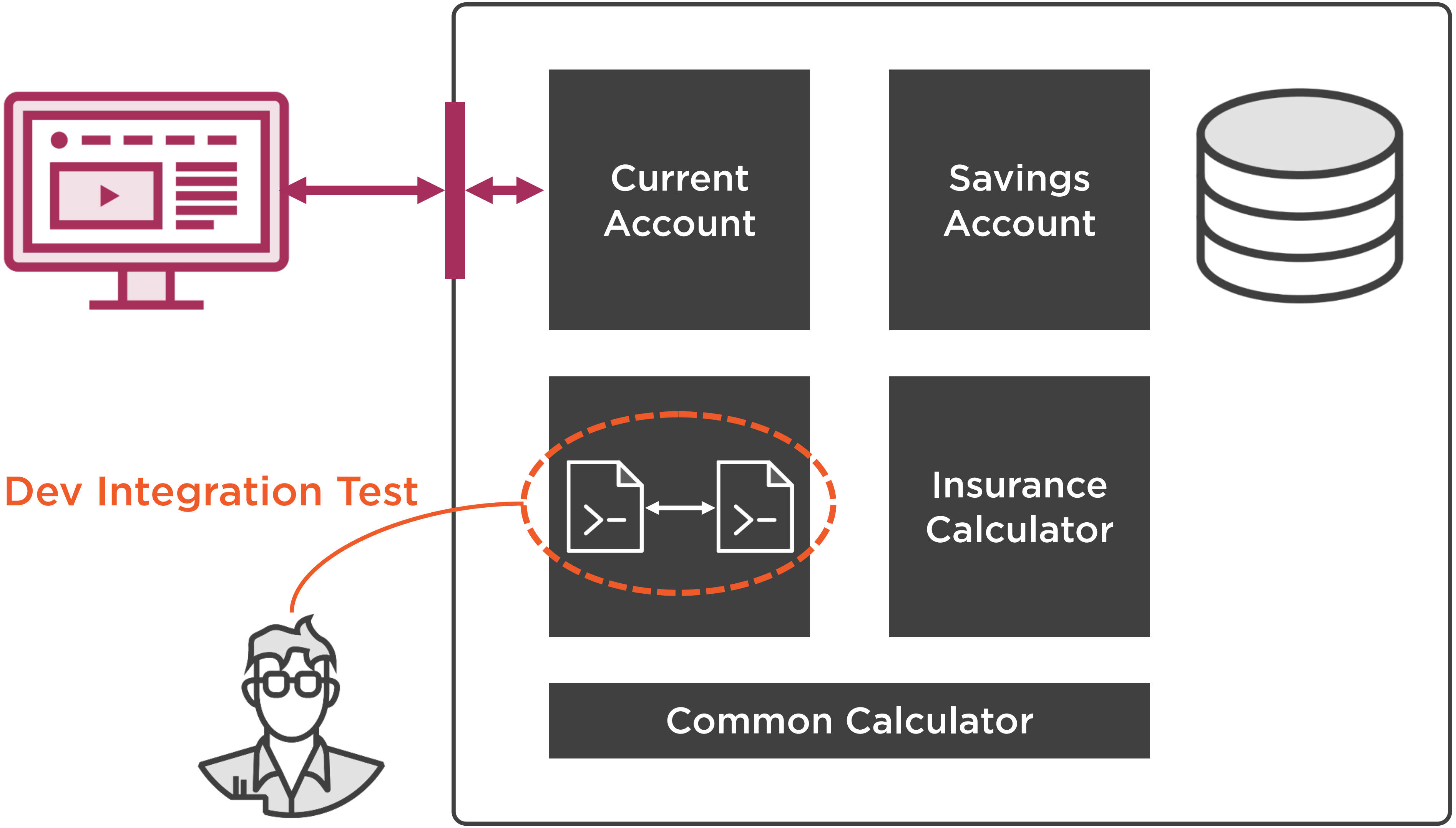
Testers:

1) Formal requirements

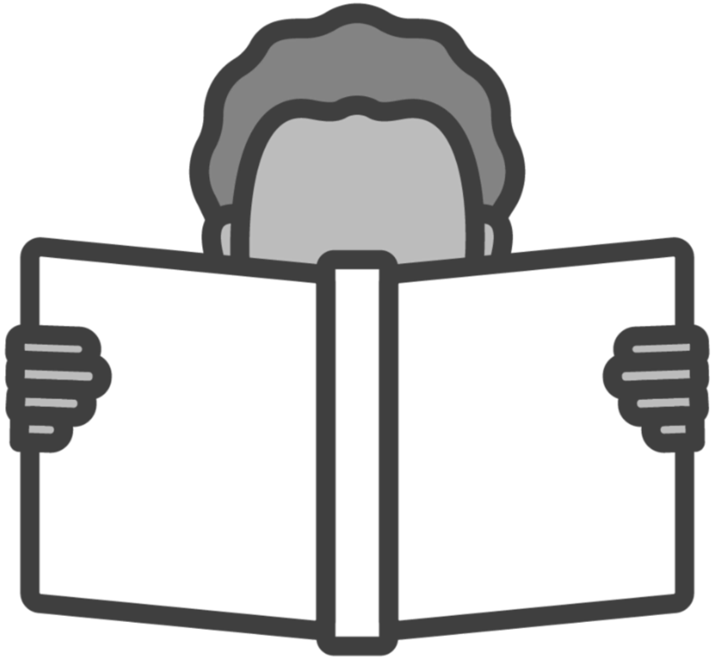


Here!


Current Account
Savings Account
Integration
Mortg. Calculator
Insurance Calculator
Integration
Common Calculator


Current Account
Savings Account
Dev Integration Test
Insurance Calculator
Common Calculator

Dev Testing



Book: Unit Testing Principles, Practices, and Patterns

- If you have programming skills
- Definitions different from ISTQB

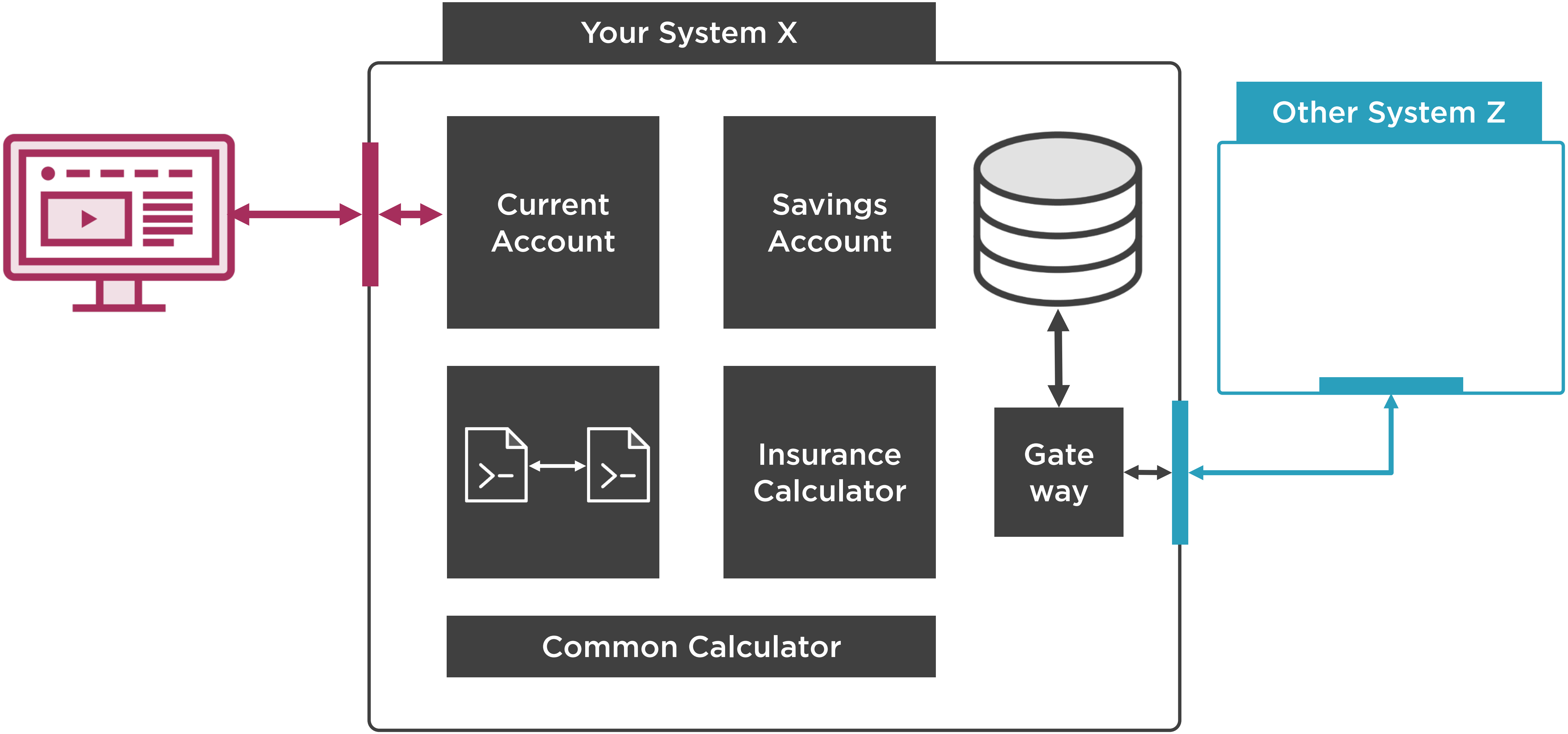
Not necessary for ISTQB exam

Integration testing: two or more “units”

Integration Testing Categories

Component Integration

System Integration


Your System X
Current Account
Savings Account
Insurance Calculator
Gate way
Common Calculator
Other System Z

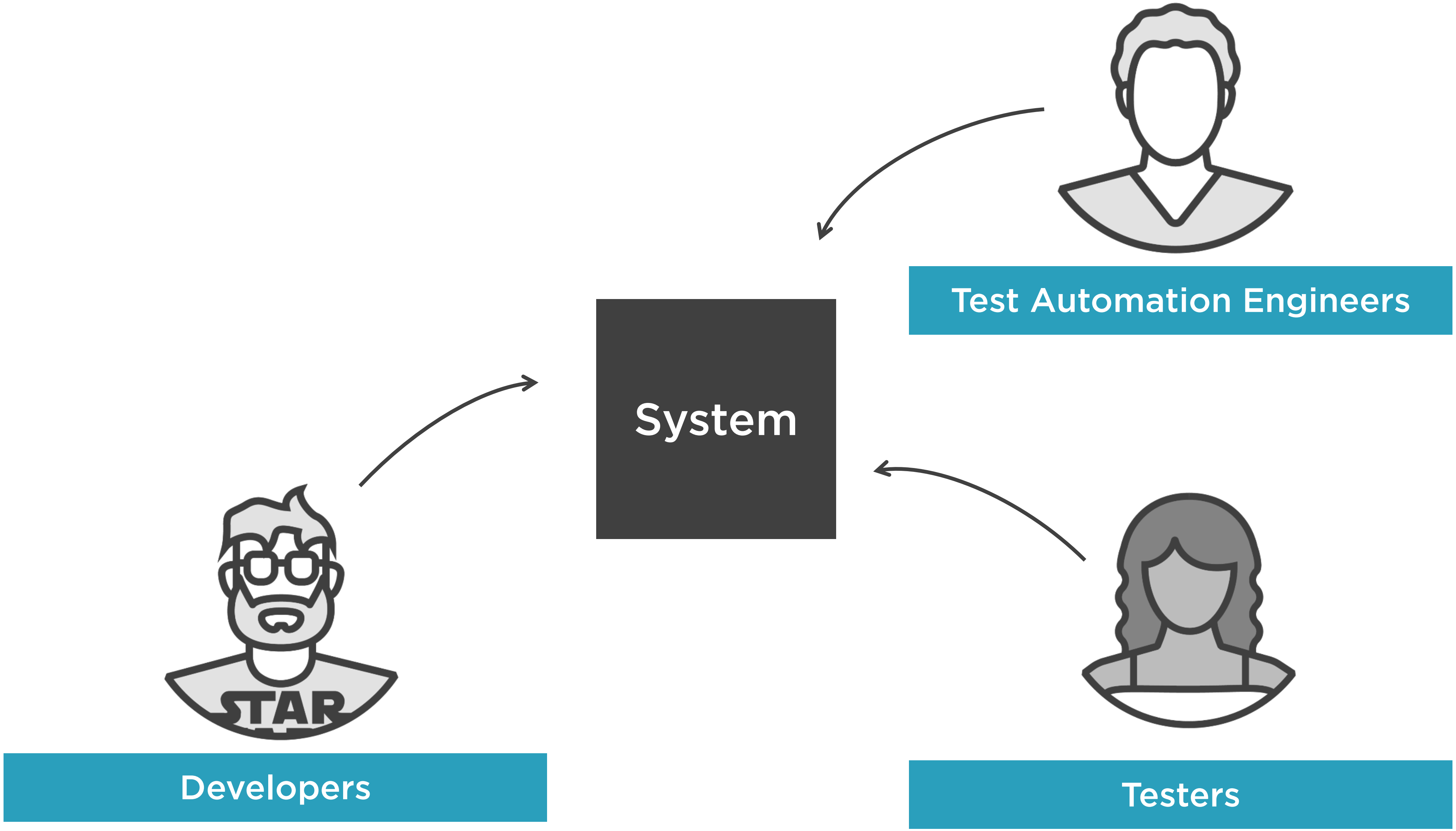
Integration Testing

Test objects:

- Subsystems
- Databases
- Infrastructure components
- Microservices

Test basis:

- Technical spec
- Design documents
- Sequence diagrams
- Public interface definitions



System

Test Automation Engineers

Developers

Testers

System Test Level

Full integration testing of all modules

System Testing

Your starting point is typically not within the system, but rather outside

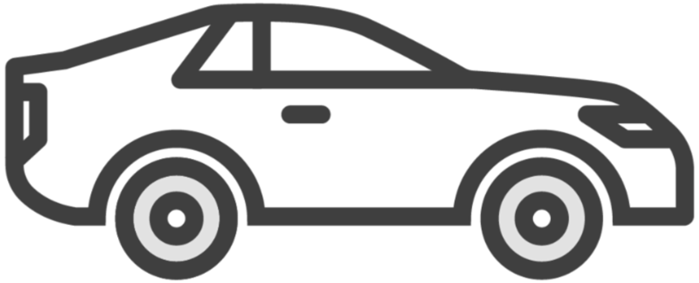
Considers system paths and flows

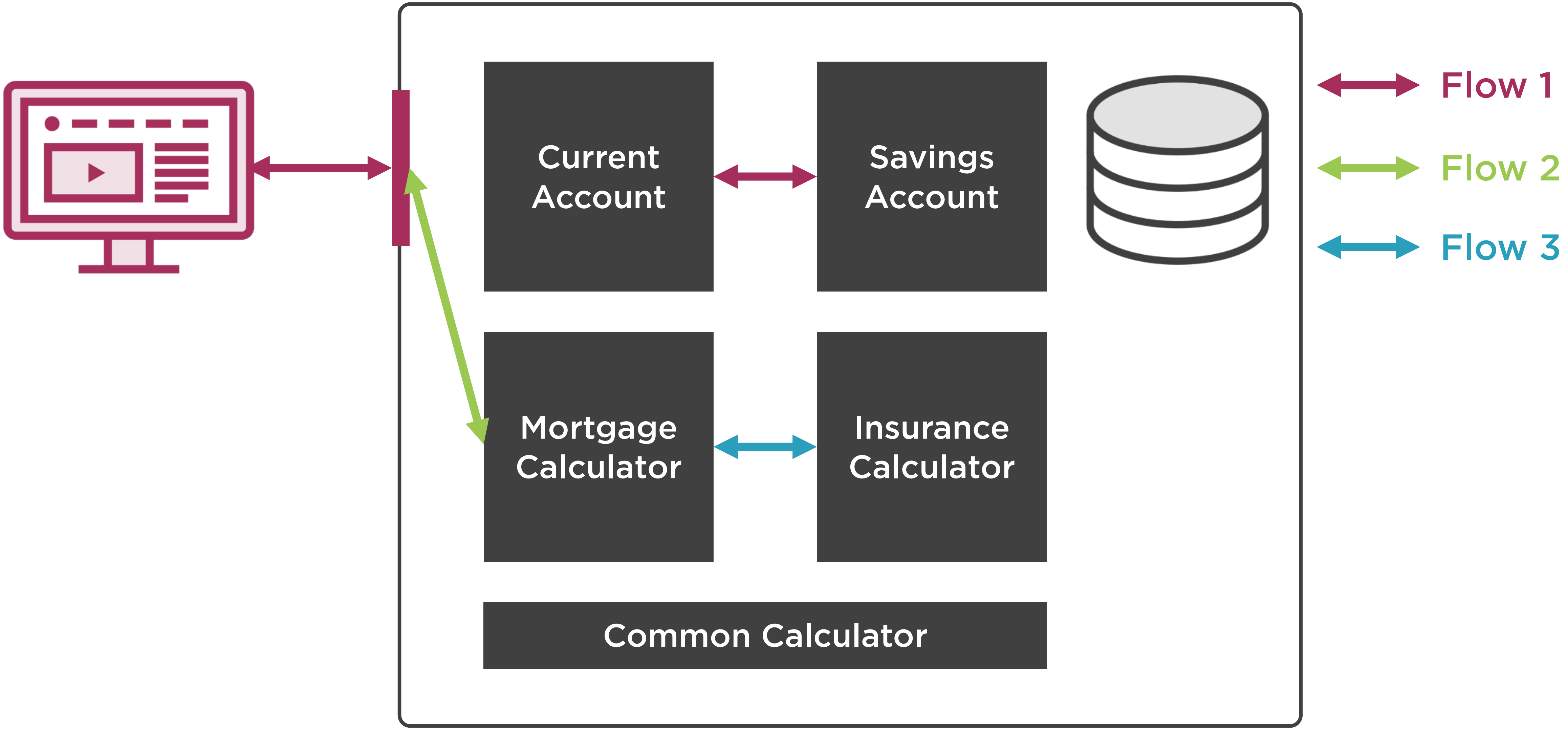
- End-to-end (e2e)
- Front-to-back (f2b)

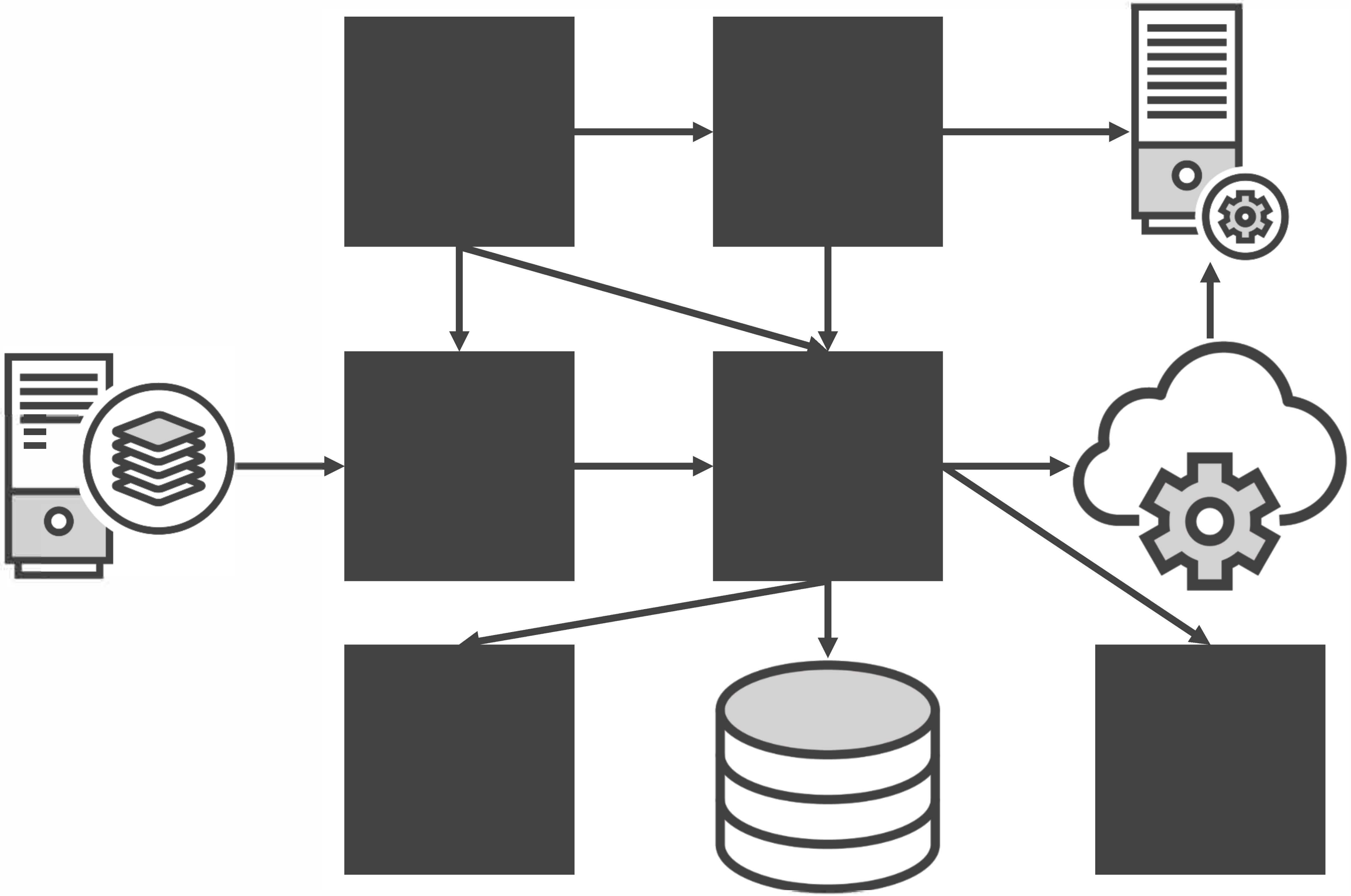
External behavior vs. inner structure

Car Integration Testing

Car System Testing



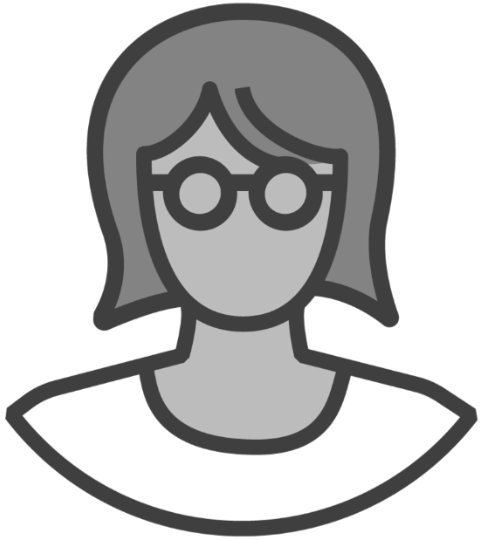

Current Account
Savings Account
Mortgage Calculator
Insurance Calculator
Common Calculator
Flow 1
Flow 2
Flow 3



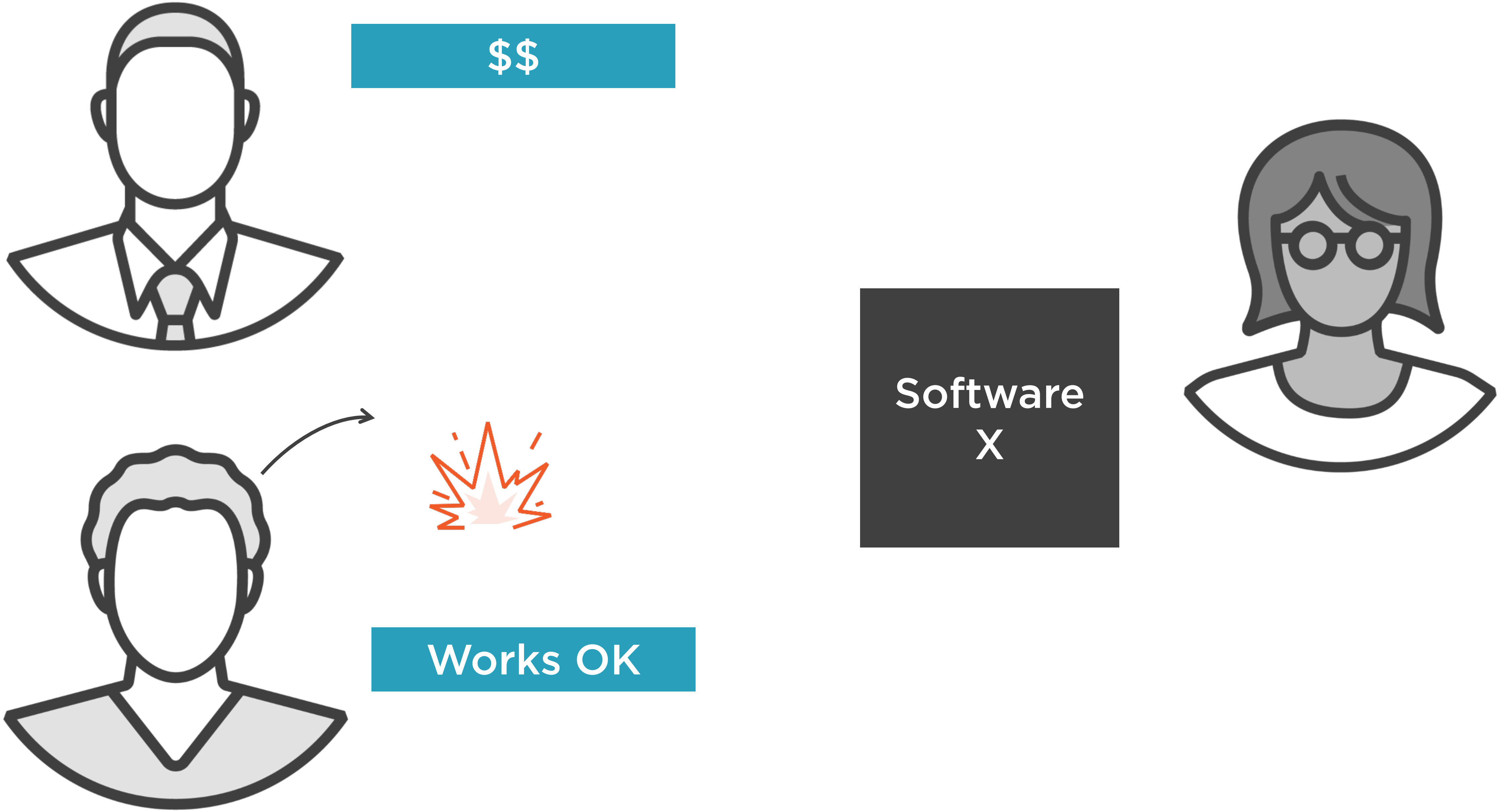
Does the car work OK?

Yes, but I ordered a minivan, not a sportscar.

It is not what I wanted, I don’t accept!



Clear and complete requirements



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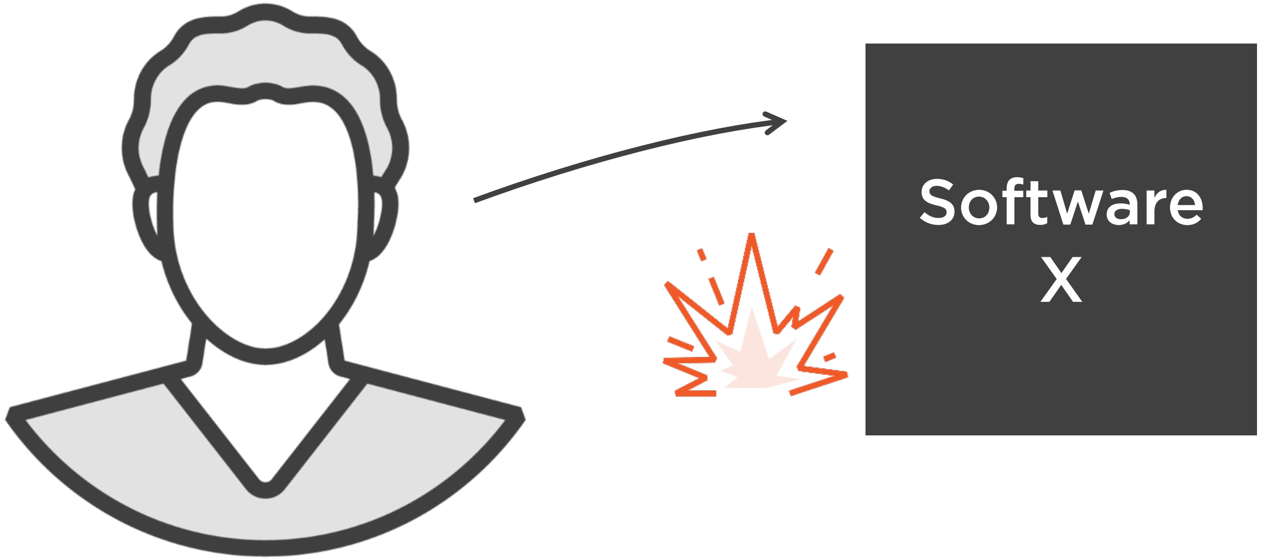
Works OK

Software X

Fix it!

You signed off.
It will cost you extra.

Fix it before we sign off!



Software
X

Acceptance Testing

UAT: User Acceptance Testing

OAT: Operational Acceptance Testing

- Backup and restore
- Installing, uninstalling, upgrading
- Disaster recovery
- Data load and migration
- Performance and load testing

Acceptance Testing

Categories: Alpha and Beta testing

Beta testing: for Commercial Off-the-shelf (COTS) software

Both carried out by independent testers or potential customers

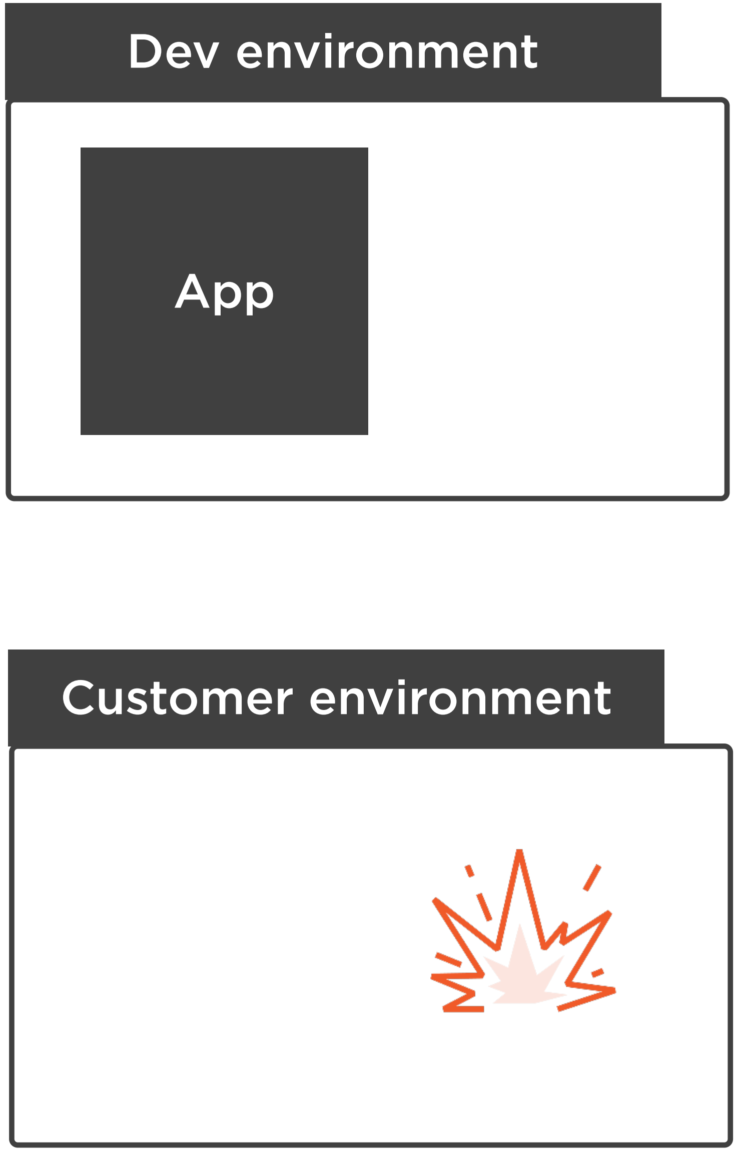
Acceptance Testing

Alpha testing happens at the developer’s site

Beta testing happens at the site of the customer

The point of Beta testing is to use the infrastructure, both hardware and software, of the end users.

It works on my machine!



Dev environment

App

Customer environment

Summary

Test levels: faster and easier to fix at lower levels

Component: test units in isolation

Integration: test 2+ units or components together

System: test all or most pieces integrated together

Acceptance: similar to system testing, done by end users or customers

Comparing Test Types