

Requirements and Software Testing

Dr. Francisco Gomes de Oliveira Neto

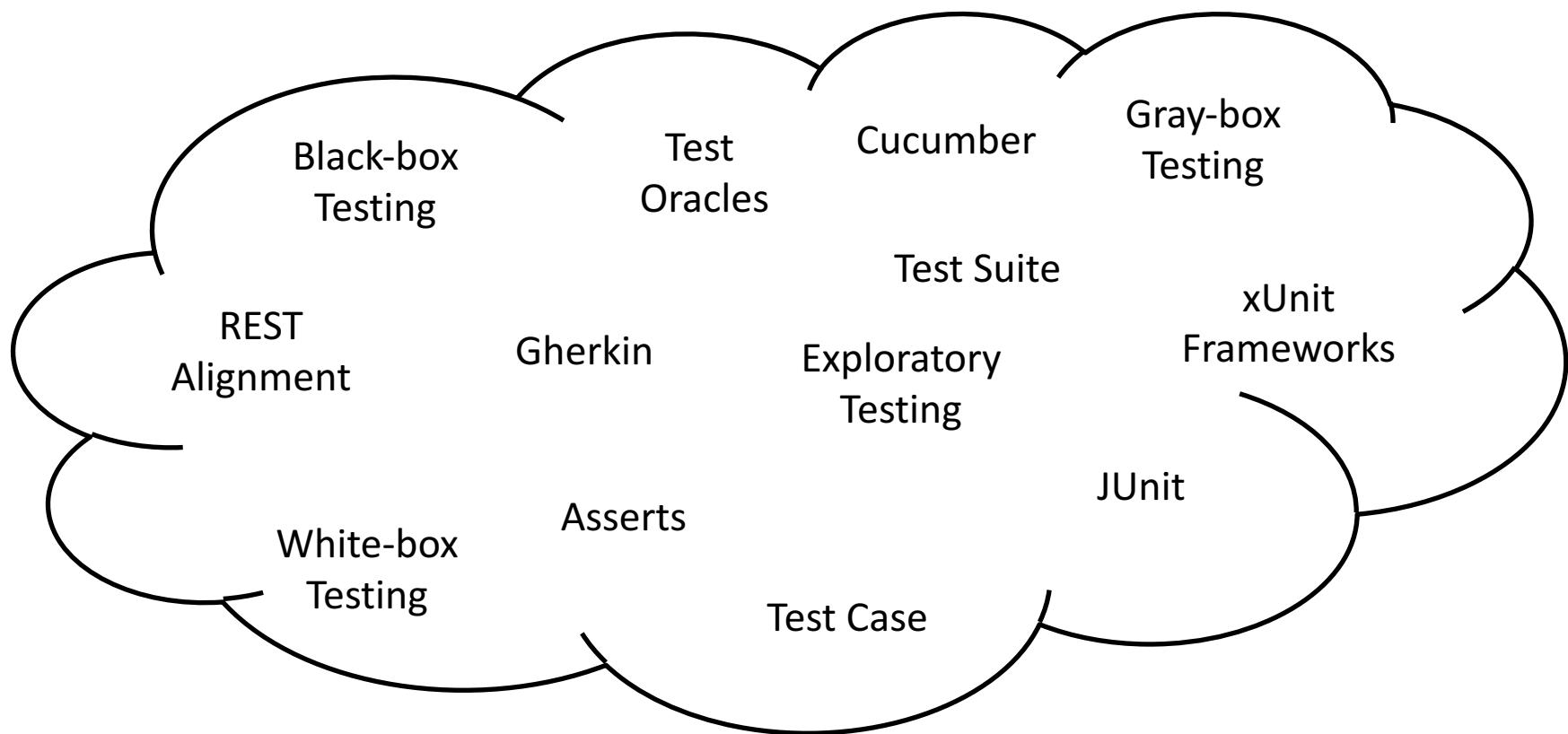
DIT045 – Requirements Engineering and User Experience

Guest lecture

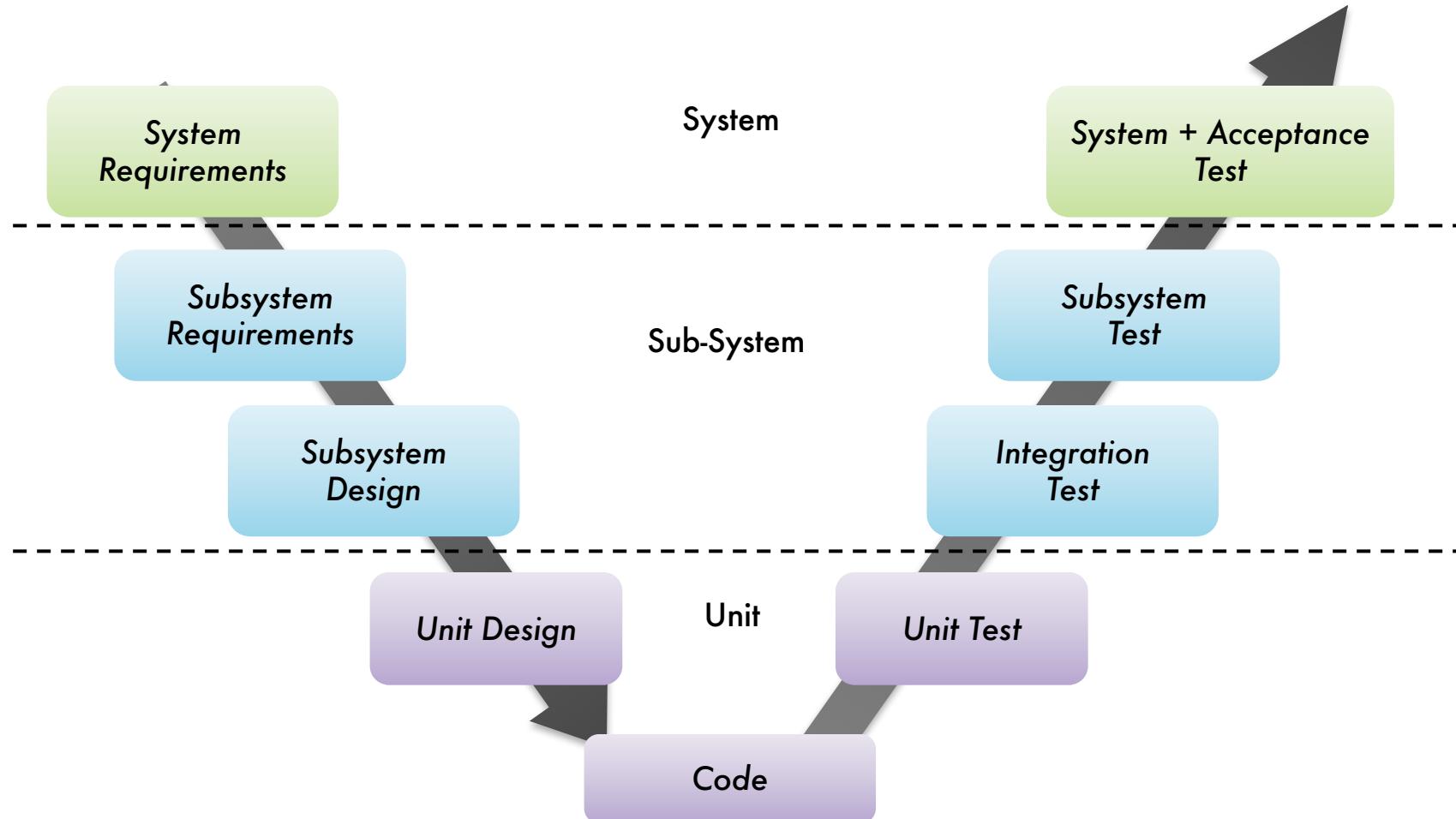
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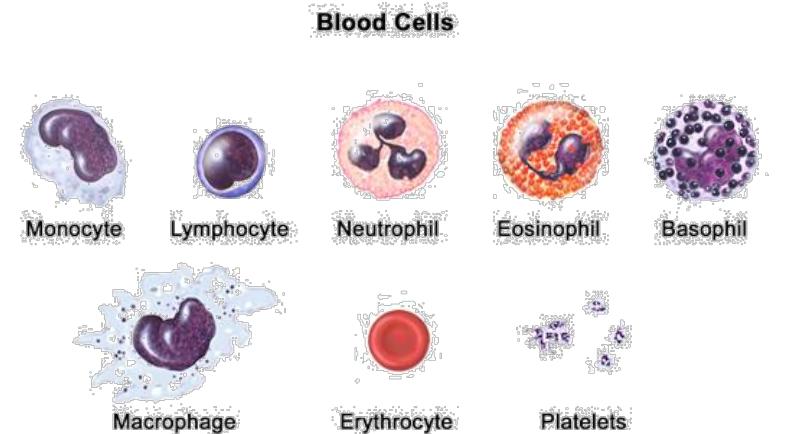
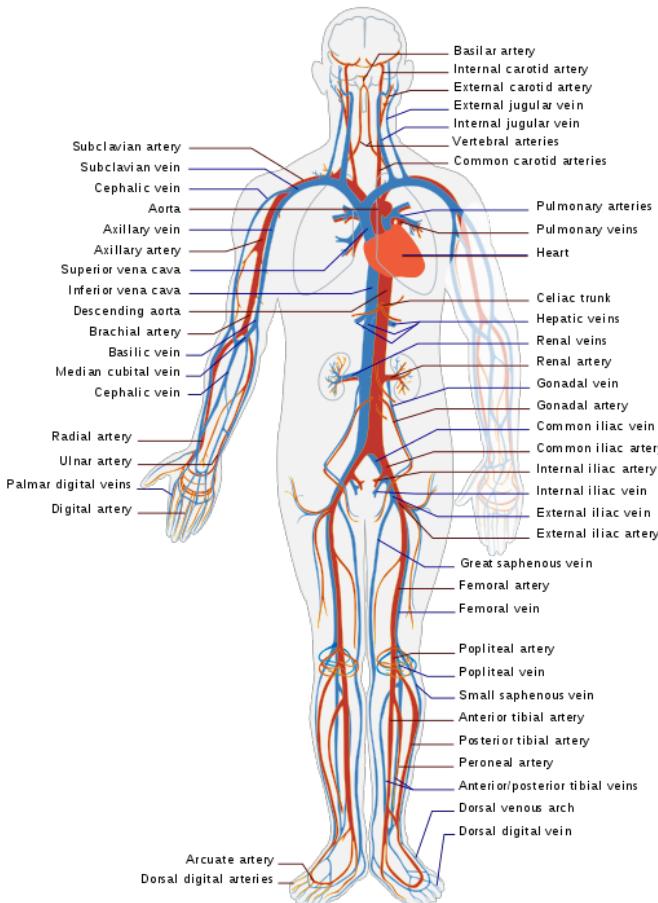
Take away



V-Model



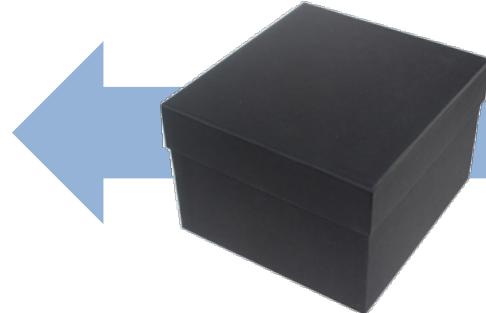
Levels of Abstraction



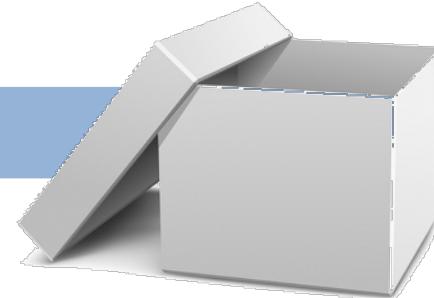
Levels of Abstraction



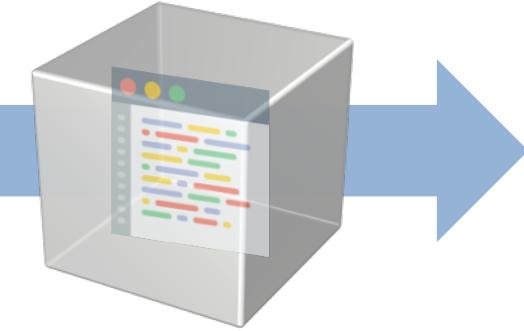
Black-box
Testing



Gray-box
Testing



White-box
Testing



What is a test case?

- A software tester

walks into a bar and then...

Runs into the bar ...

Strolls into the bar ...

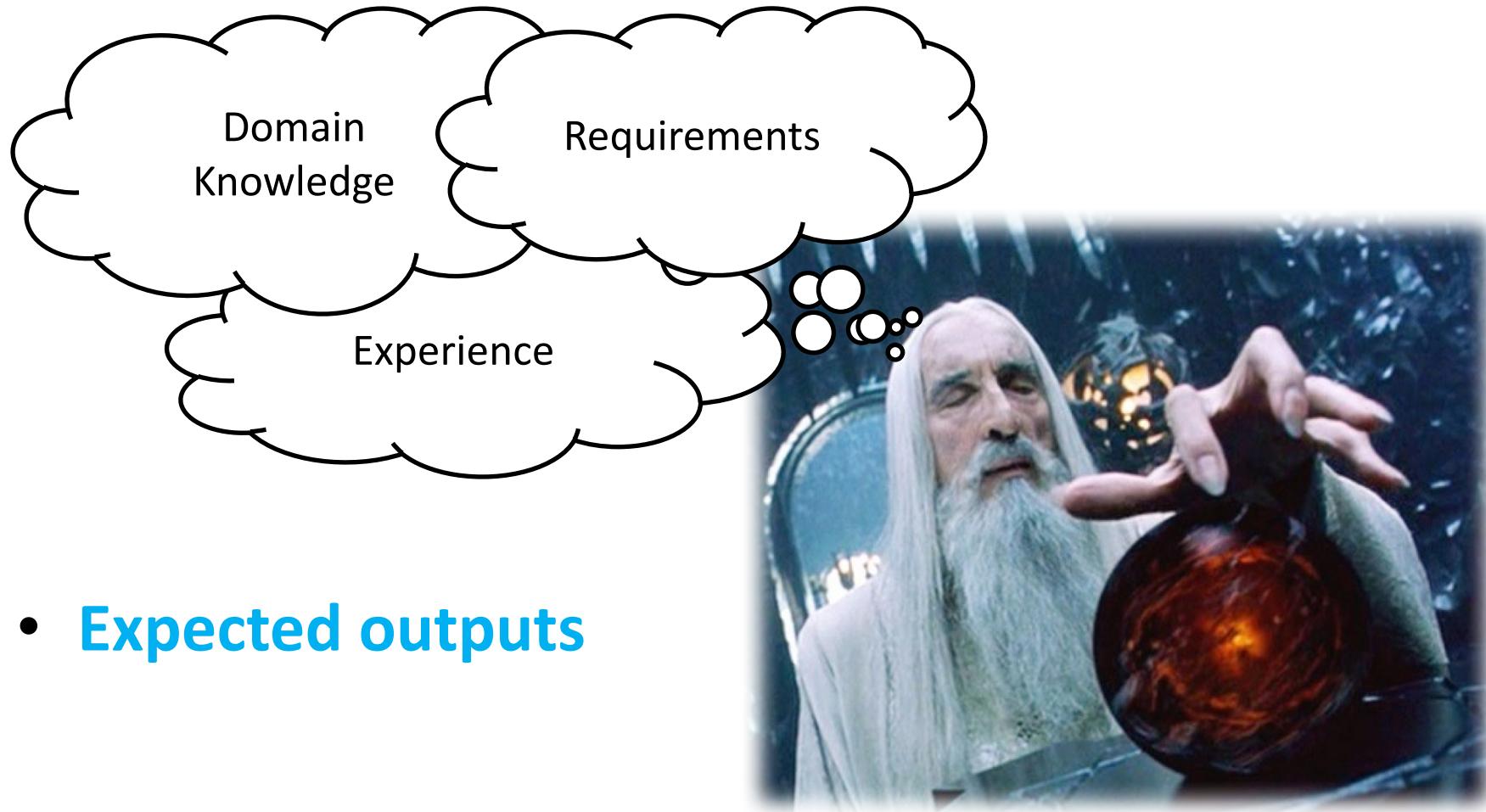
Gallops into the bar ...

Saunters into the bar ...

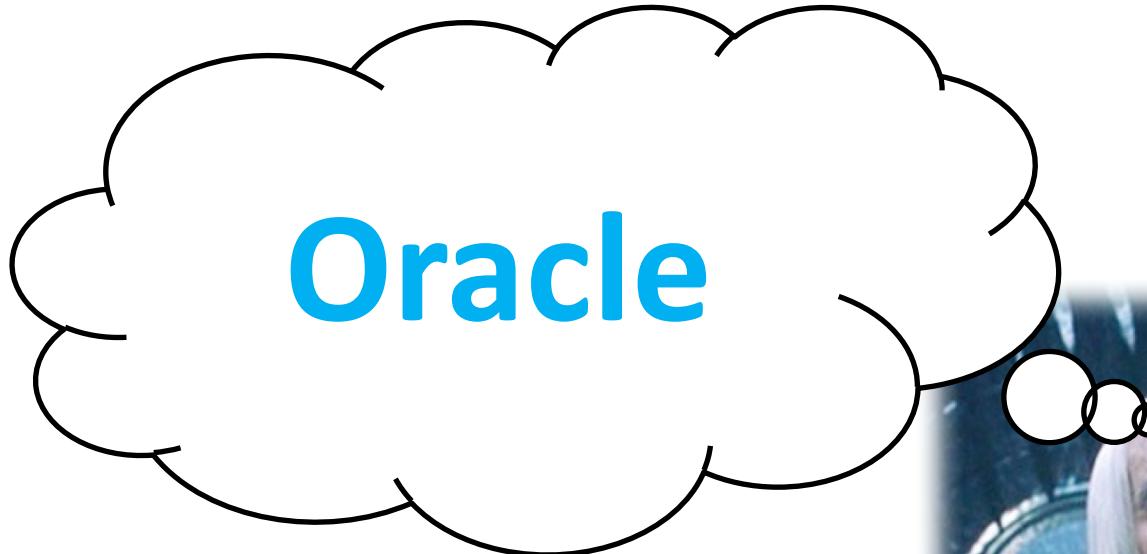
What is a test case?

- **Set of conditions** checking whether the system/application **works as expected**.
- Pre-conditions
- User actions
- Expected outputs
- Extra information

What is a test case?



What is a test case?

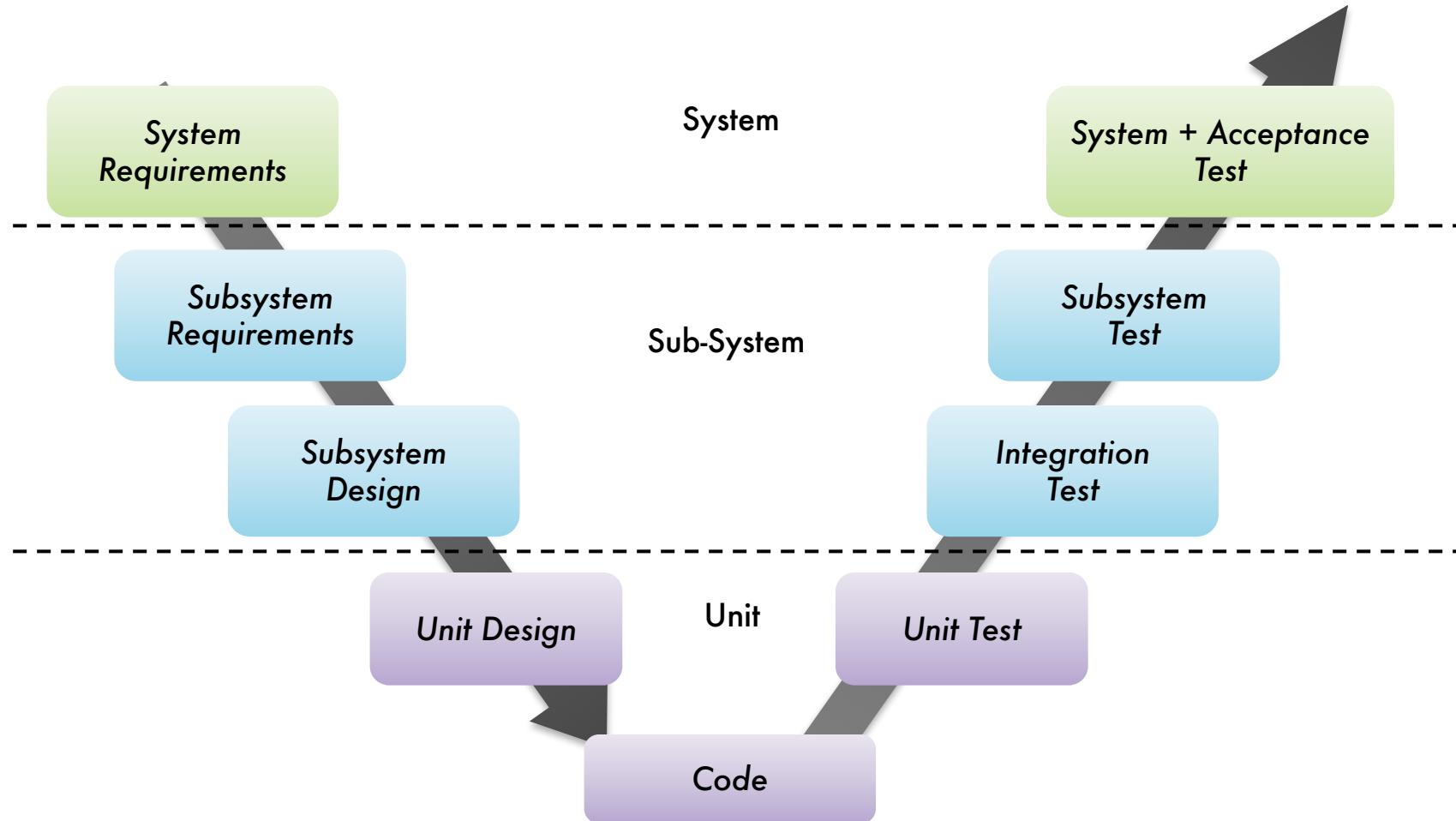


Oracle

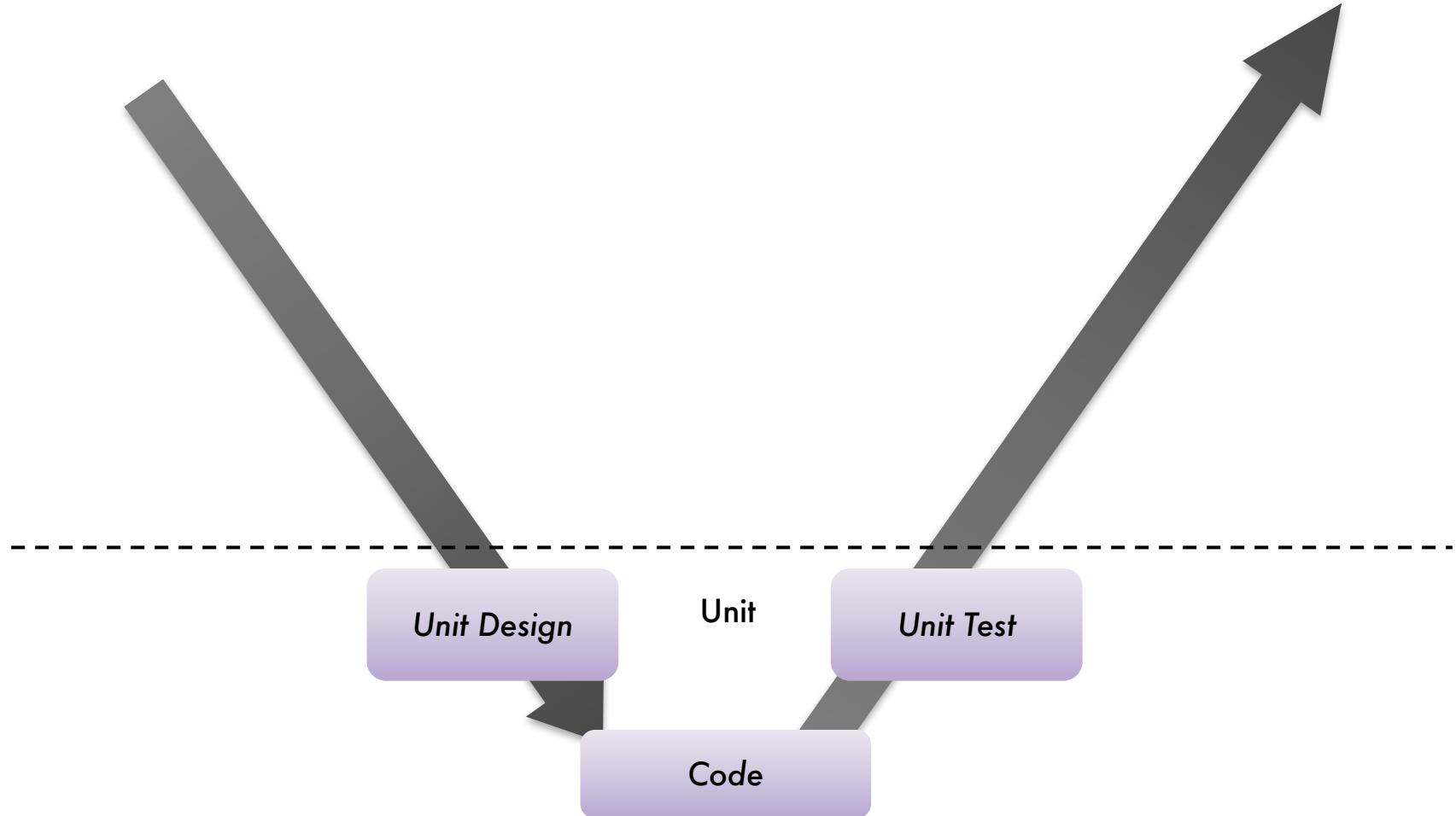


- Expected outputs

Types of Testing



Unit Testing



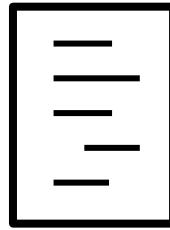
Unit Testing

Unit Tests

*Piece of code that **invokes** a unit of work to check one end result*

Unit of Work

#1



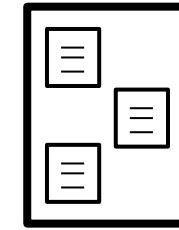
Unit of Work

#2



Unit of Work

#3



xUnit Frameworks



- **Code libraries** and modules that help developers write unit test for their code.
- They enable **automation** to specify, execute and maintain your unit tests





Image: <https://goo.gl/noiKtd>

Benefits and Drawbacks

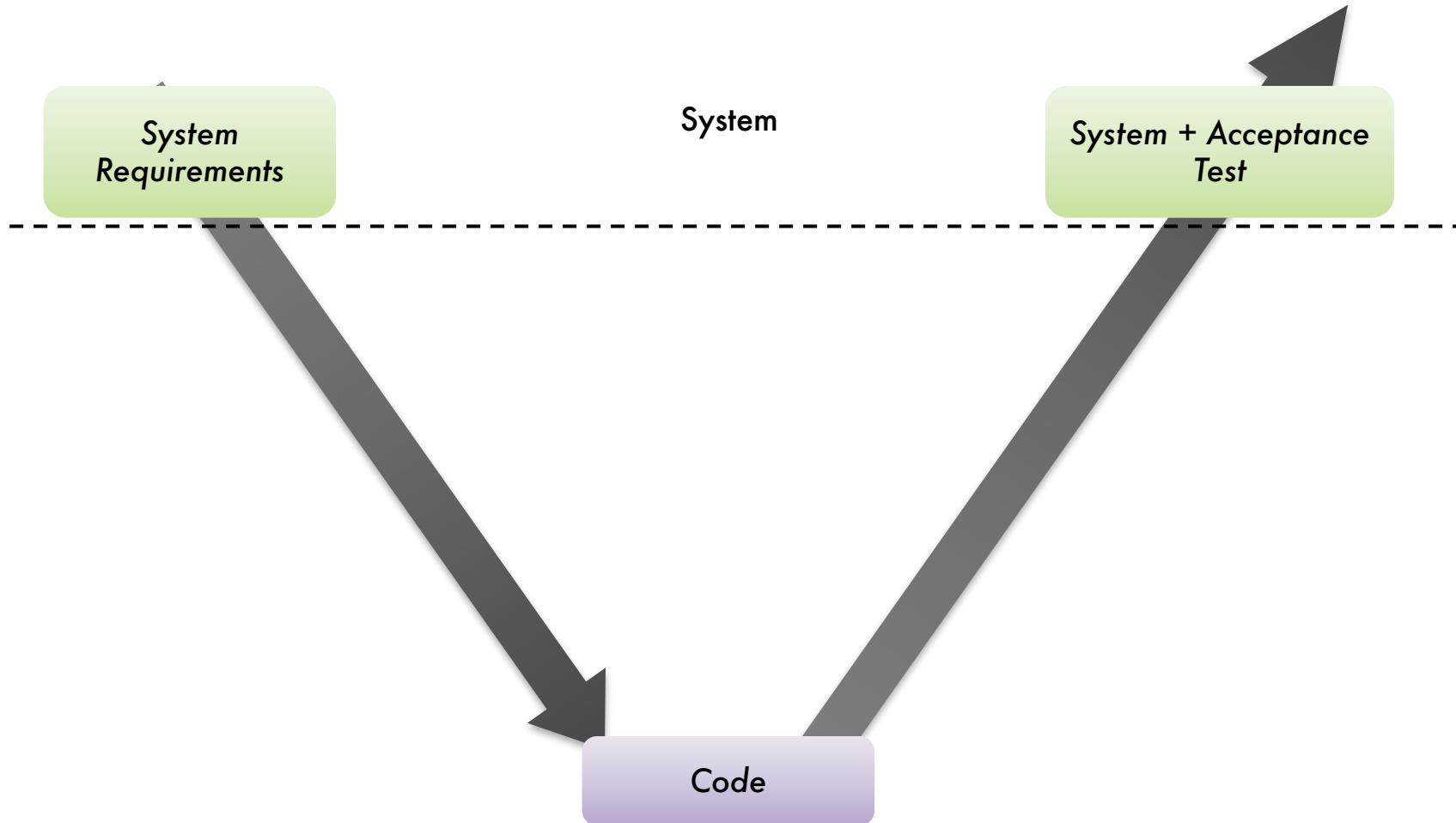
Pros:

- Automated, **trustworthy**, maintainable;
- **Easy** and **quick** to execute;
- Closer to the **defect level**;

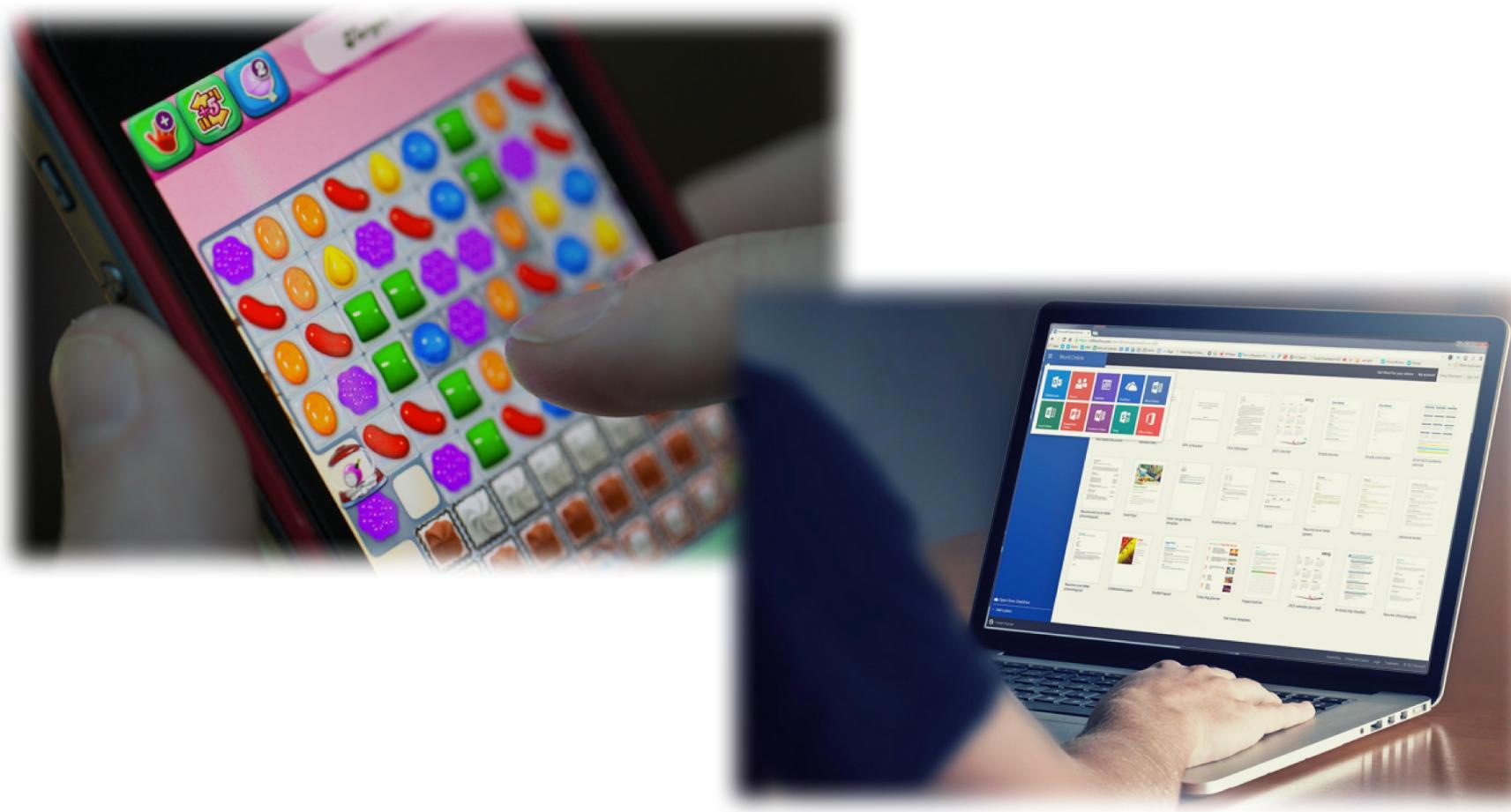
Cons:

- Requires **skills** to write good unit tests;
- Dependent on **language** and frameworks;

System Testing



System level



System level testing

What is it?

Activity to **evaluate system compliance** with
requirements

System level testing

What is it?

Activity to **evaluate system compliance** with
requirements

What to do?

Execute **the system** to **expose failures**

System level testing



What to do?

expose failures

How to System Test?

- **Manual**
- **Automated**
 - Capture-replay (Selenium)
 - With Behaviour Drive-Development (Cucumber)
 - Visual GUI Testing (EyeAutomate)

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www.cucumber.io

cucumber 



Image: <https://goo.gl/noiKtd>

System level testing

- **Exploratory** testing



Understand
the System



Design
Test Cases



Run
Test Cases

Benefits and Drawbacks

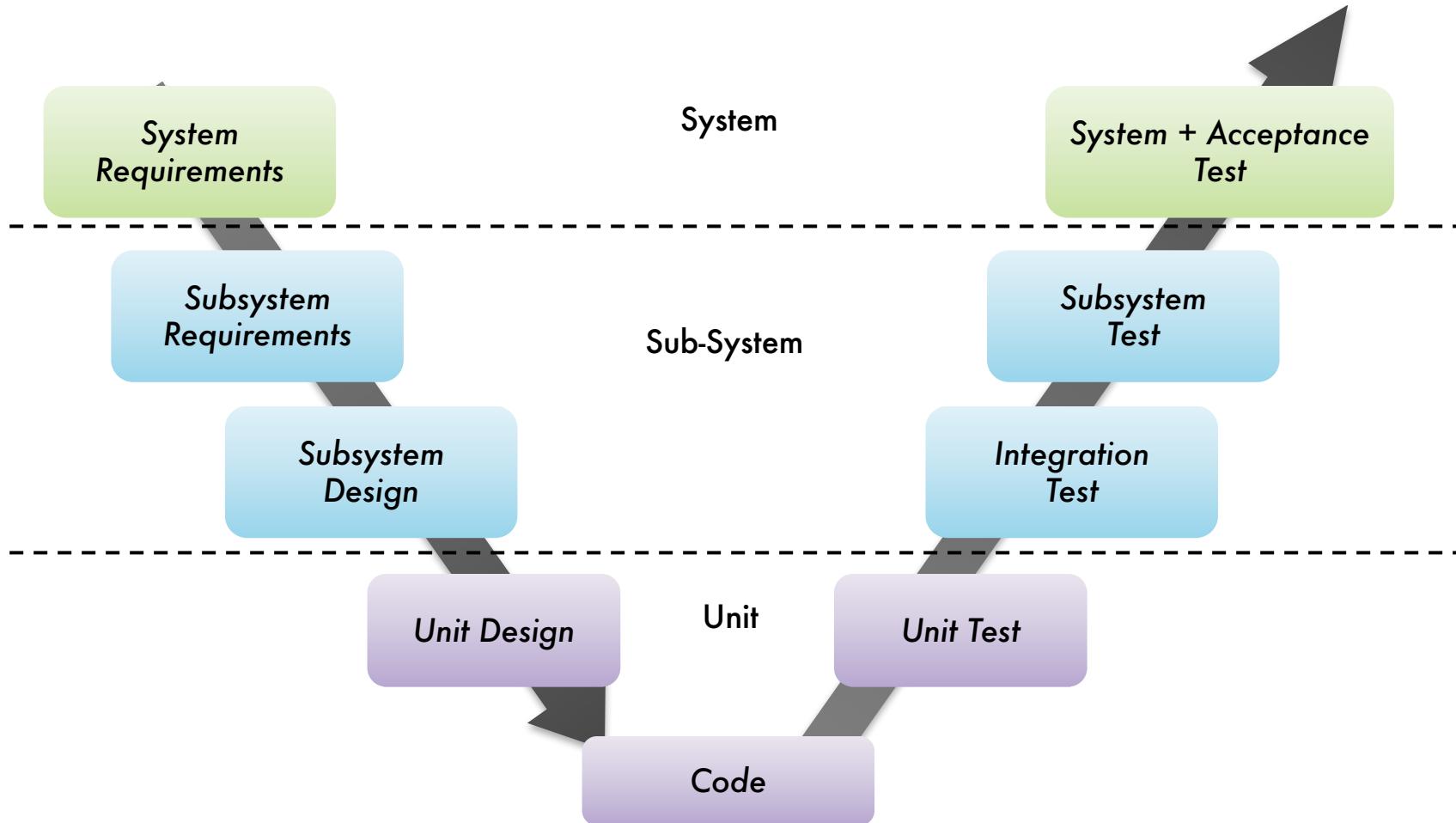
Pros:

- Closer to **requirements**
- Can be used during **demo sessions** with customers

Cons:

- Hard to automate
- Finding failures is not the same as **finding defects**;

RE and ST Alignment

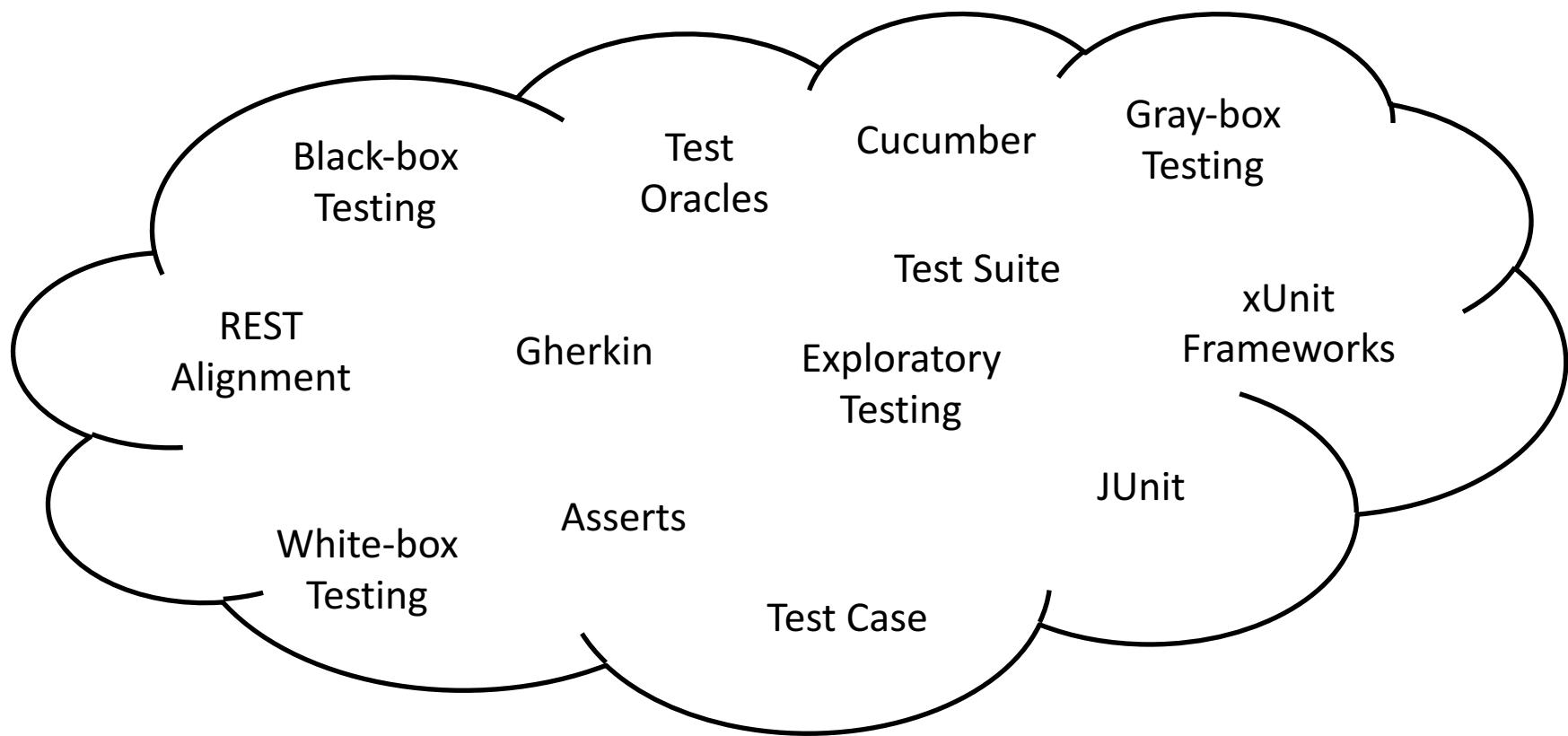


RE and ST Alignment

- Requirements are **input for testing**
 - Poor requirements = Poor testing
 - Use tests as requirements (careful)
- **Maintenance** of requirements and tests
- **Traceability** to enable automation



Take away



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