



Software Development Lifecycles

Created By: Tarek Roshdy

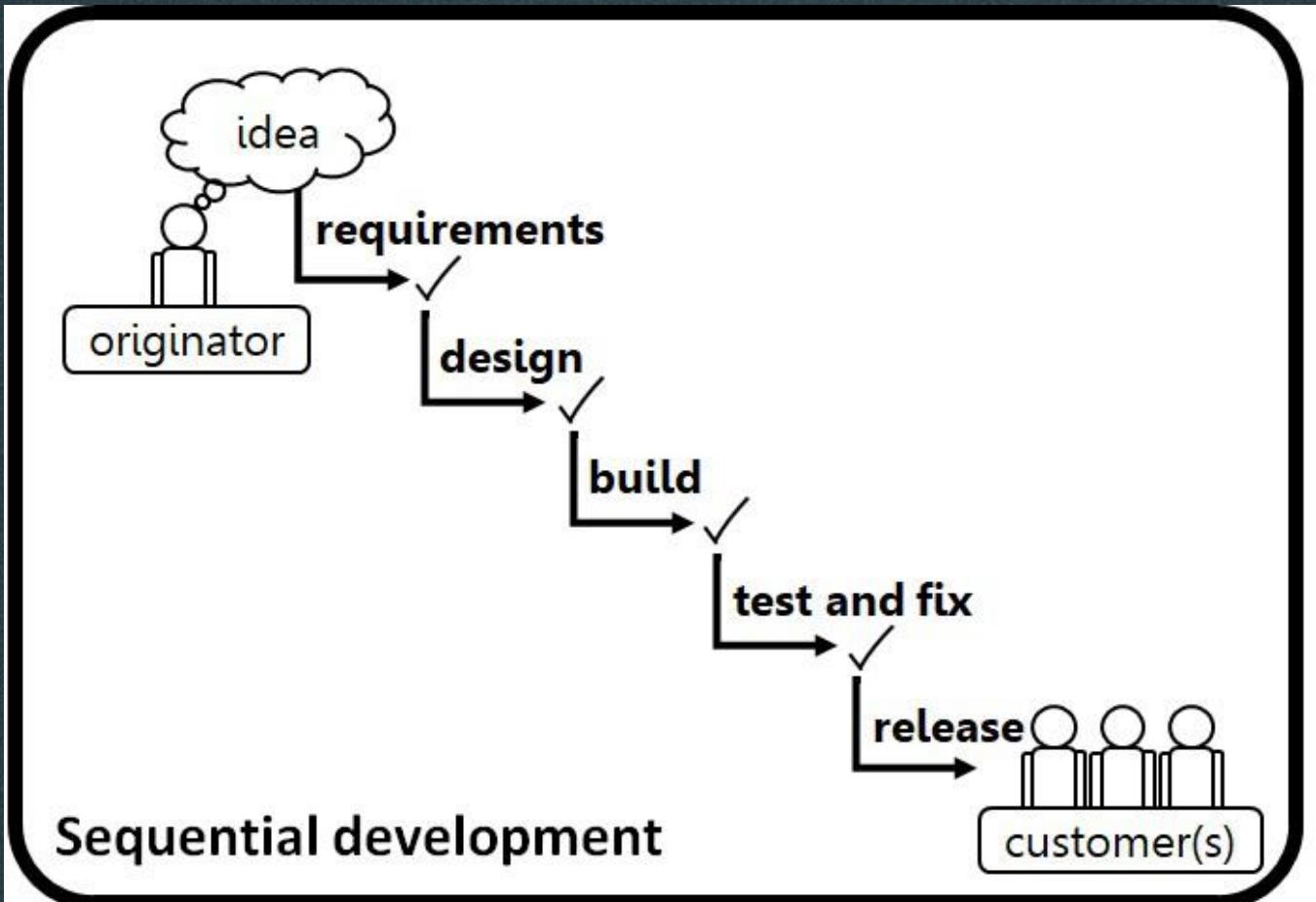


Software Development Lifecycle



A **Software Development Lifecycle Model** describes the types of activities performed at each stage in a software development project, and how the activities relate to one another logically and chronologically.

Software Development Lifecycle



```
graph TD; SDLC((SDLC)) --> Sequential((Sequential)); SDLC --> Iterative[Iterative & Incremental]
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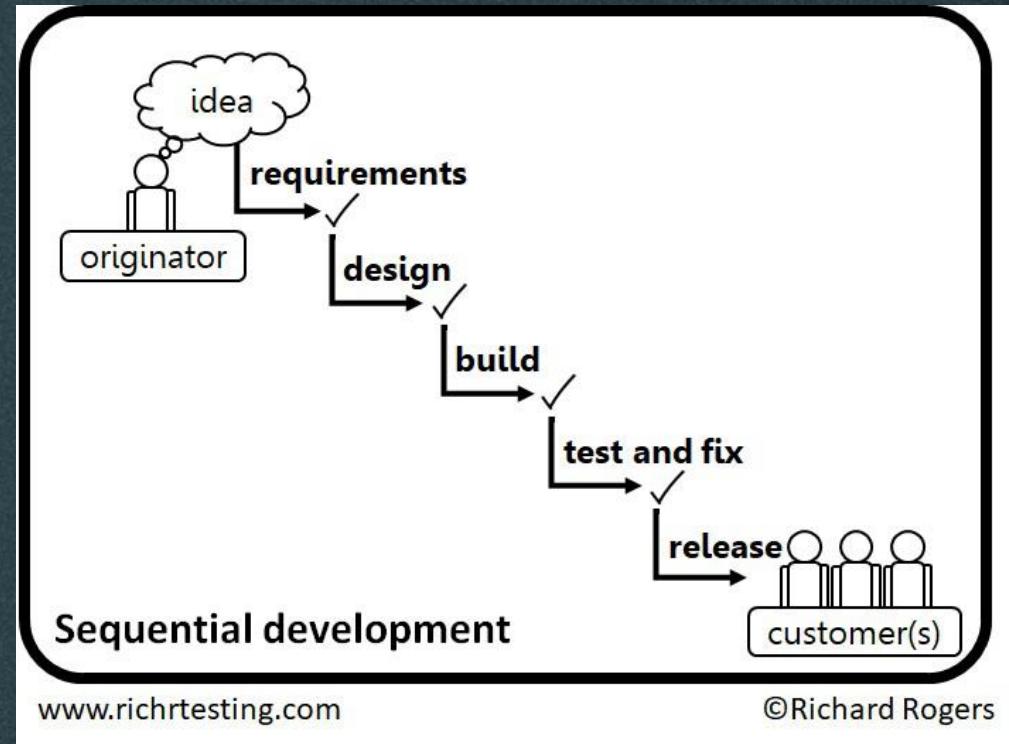
SDLC

Sequential

Iterative &
Incremental

Sequential Software Development

- A sequential development model describes the software development process as a linear, **sequential flow** of activities.
- This means that any phase in the development process should begin when the previous phase is complete.
- In theory, there is no overlap of phases, but in practice, it is beneficial to have early feedback from the following phase

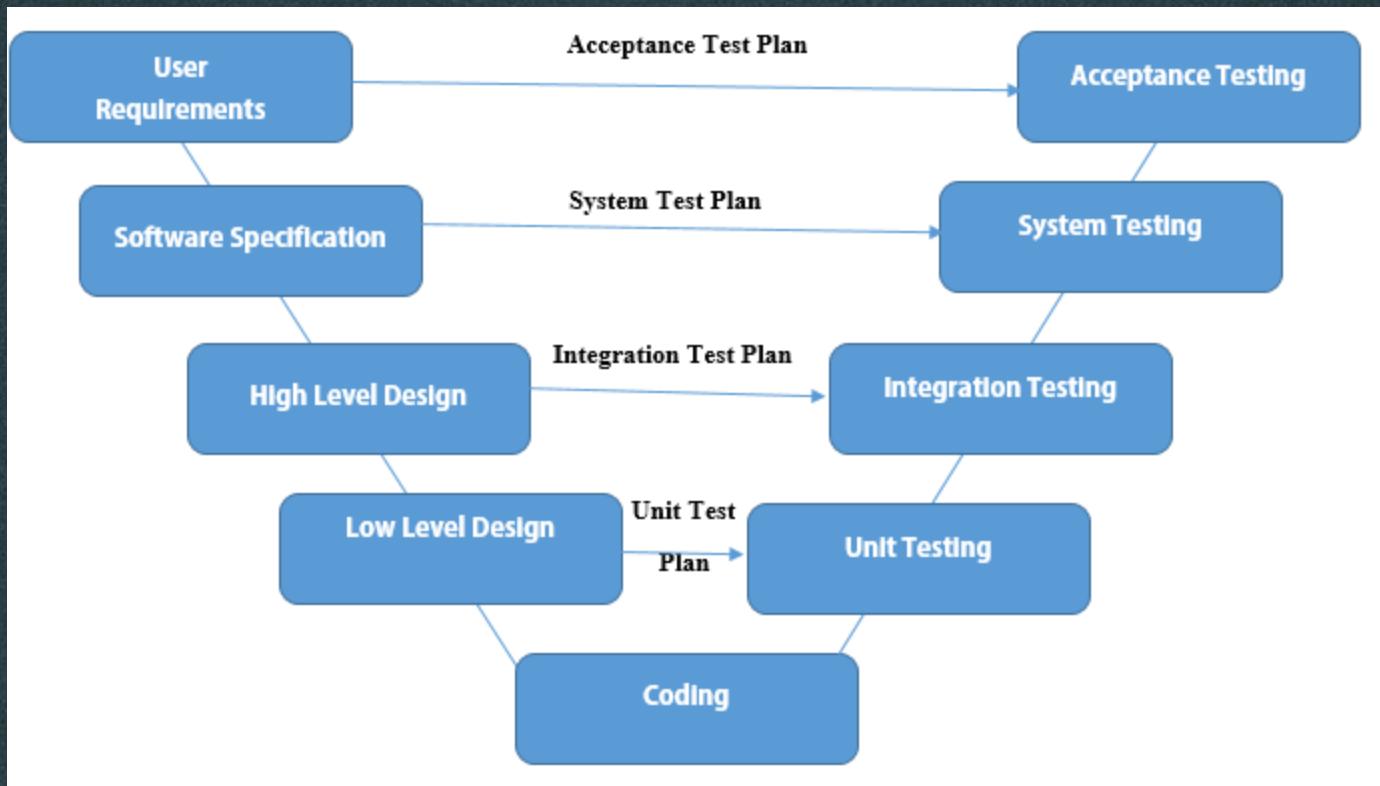


Waterfall Model

- In the Waterfall model, the development activities are completed one after another.
- In this model, test activities only occur after all other development activities have been completed



V-Model



Unlike the Waterfall model, the V-model integrates the test process throughout the development process, implementing the principle of early testing.

Iterative & Incremental Models

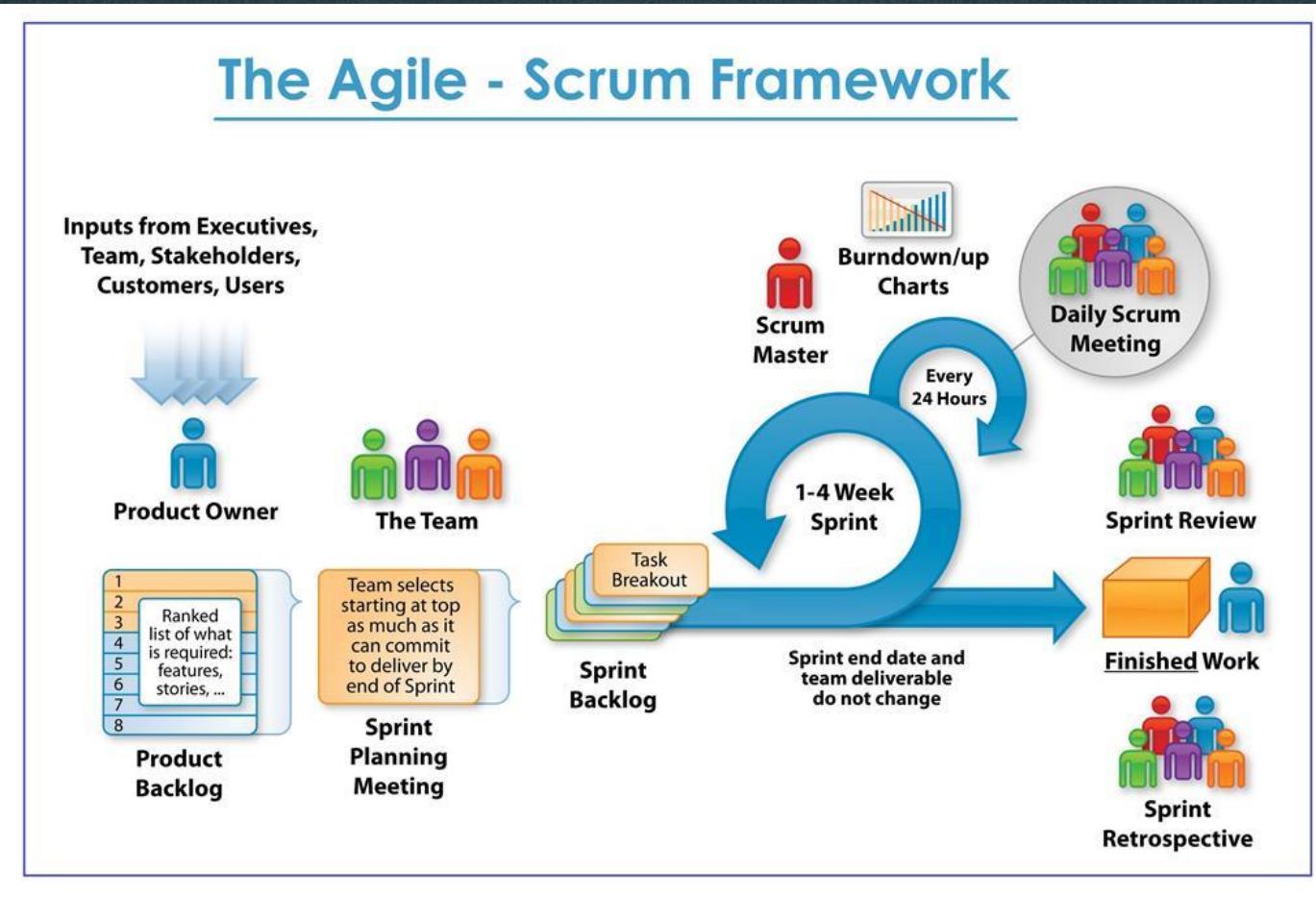
Iterative



Incremental



Scrum



Each iteration tends to be **relatively short** (e.g., hours, days, or a few weeks), and the feature increments are correspondingly small, such as a few enhancements and/or two or three new features



What is Software Testing?

Created By: Tarek Roshdy



What is Software Testing?

- Most people have had an experience with software that did not work as expected.
- Software that does not work correctly can lead to many problems, including:
 - **Loss of money, time, or business reputation**
 - **Injury or death**



What is Software Testing?

- **Software testing** is a way to:
 - ✓ assess the quality of the software
 - ✓ reduce the risk of software failure in operation



What is Software Testing?

- **Software Testing ≠ Test Execution**
- **software testing is a process which includes many different activities**
- **Execution is only one of these activities.**



Software
Testing

Dynamic
Testing

Static
Testing



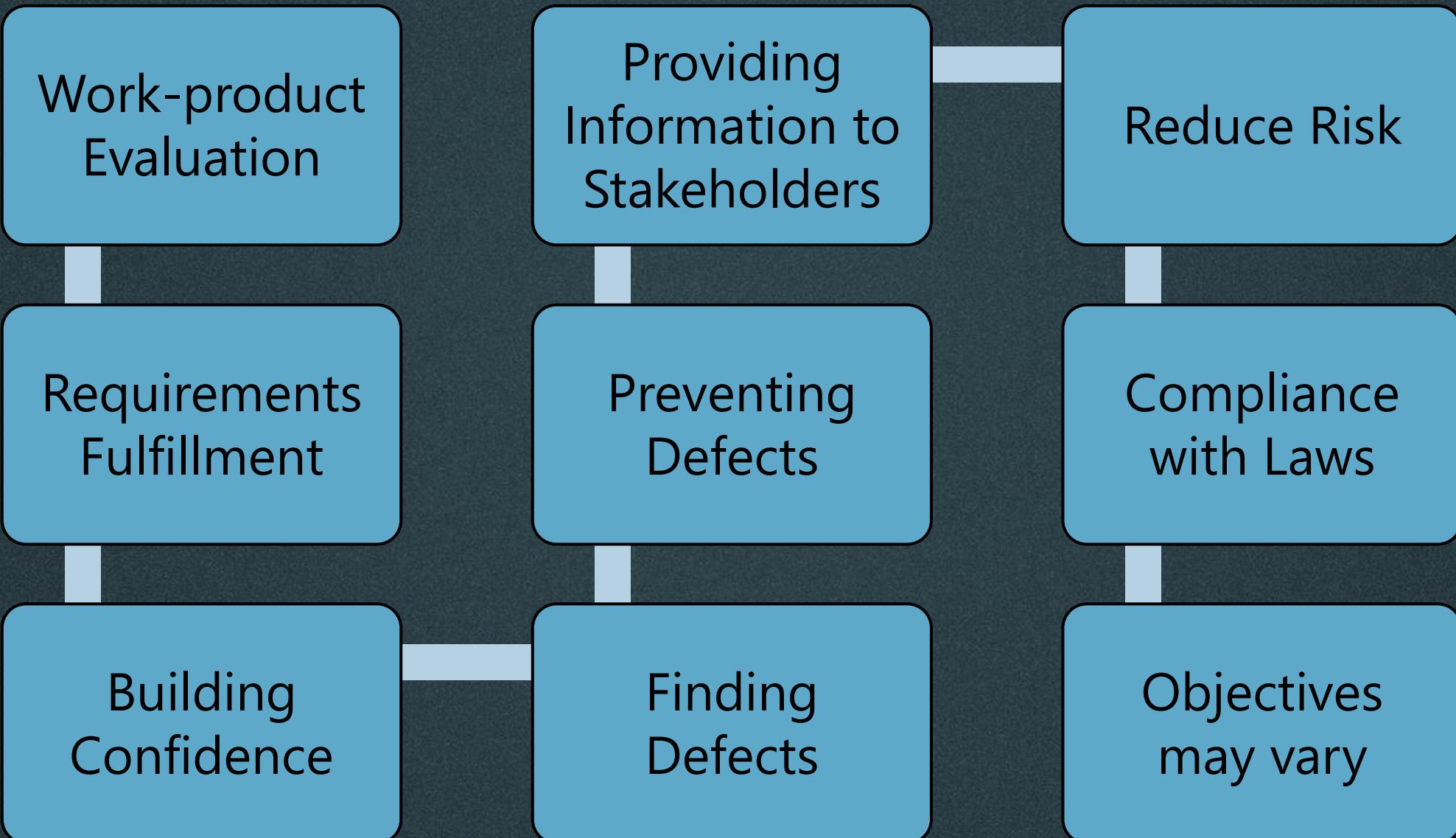
Software
Testing

Validation

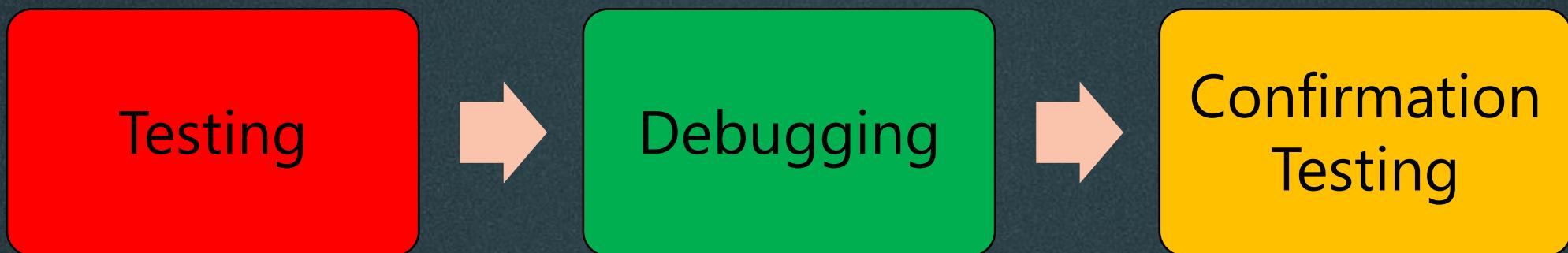
Verification



Objectives of Software Testing



Relationship between Testing & Debugging



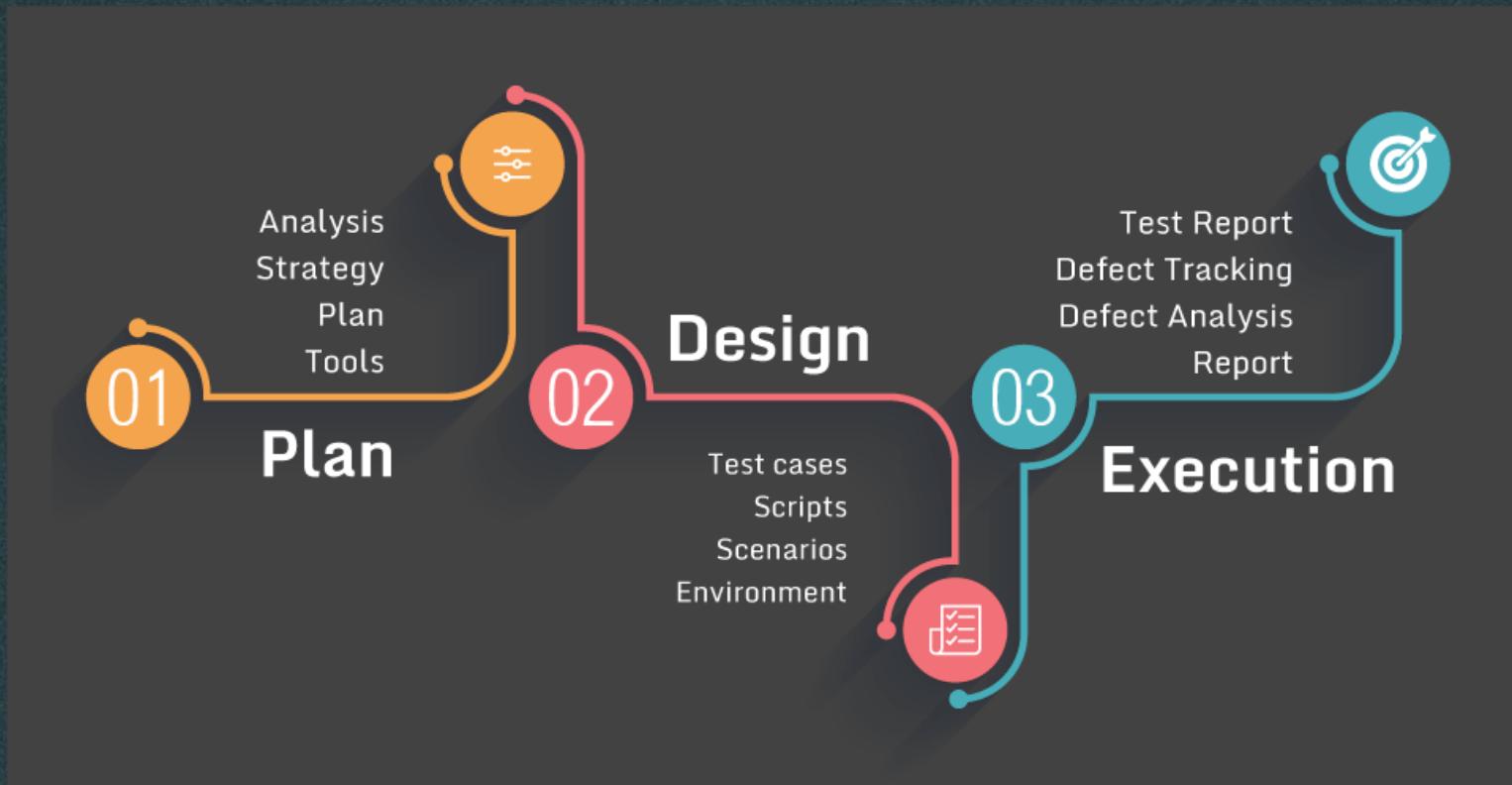


Test Process

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Test Process



There is no one universal software test process, but there are common sets of test activities without which testing will be less likely to achieve its established objectives

Test Process Activities

Test Planning

Test Monitoring & Control

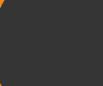
Test Analysis

Test Design

Test Implementation

Test Execution

Test Completion



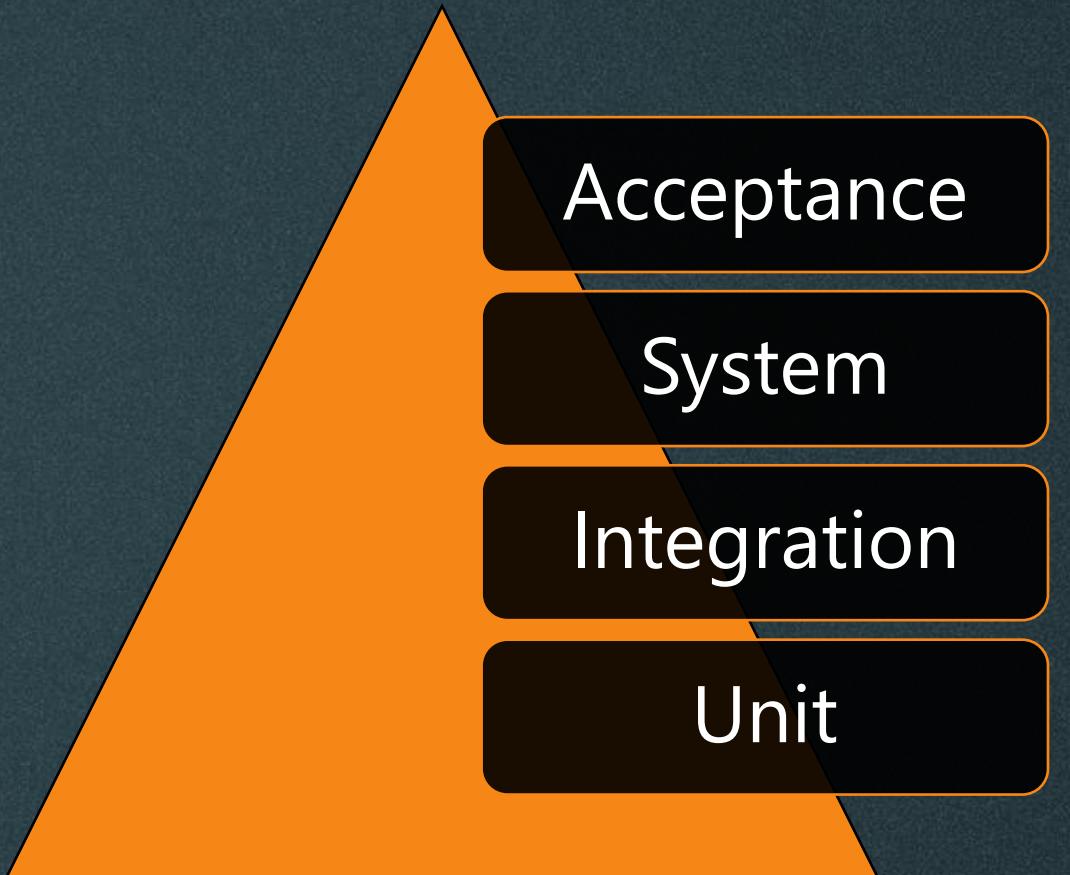
Test Levels

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Test Levels

- **Test levels are groups of test activities that are organized and managed together.**
- **Each test level is an instance of the test process**
- **Test levels are related to other activities within the software development lifecycle.**



Component (Unit) Testing

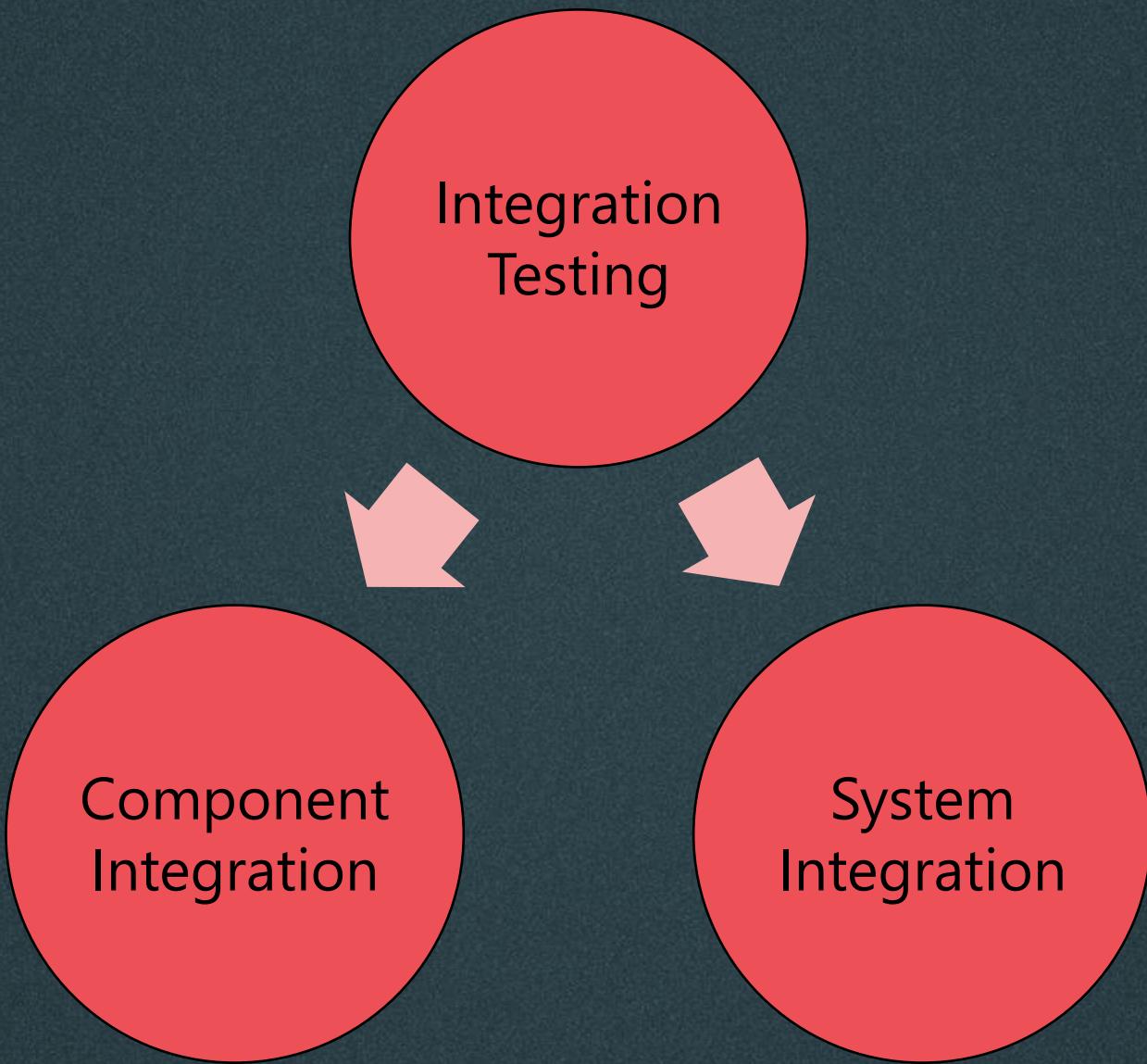


Component testing (also known as unit or module testing) focuses on components that are separately testable

Integration Testing



Integration testing focuses on interactions between components or systems

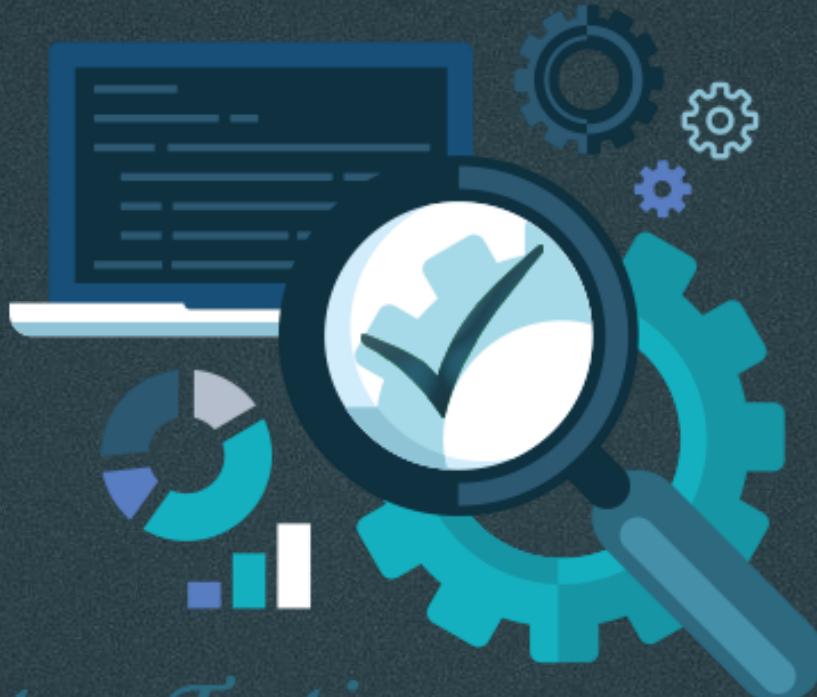


Integration Testing

- Component integration testing is often the responsibility of **developers**.
- System integration testing is generally the responsibility of **testers**.



System Testing

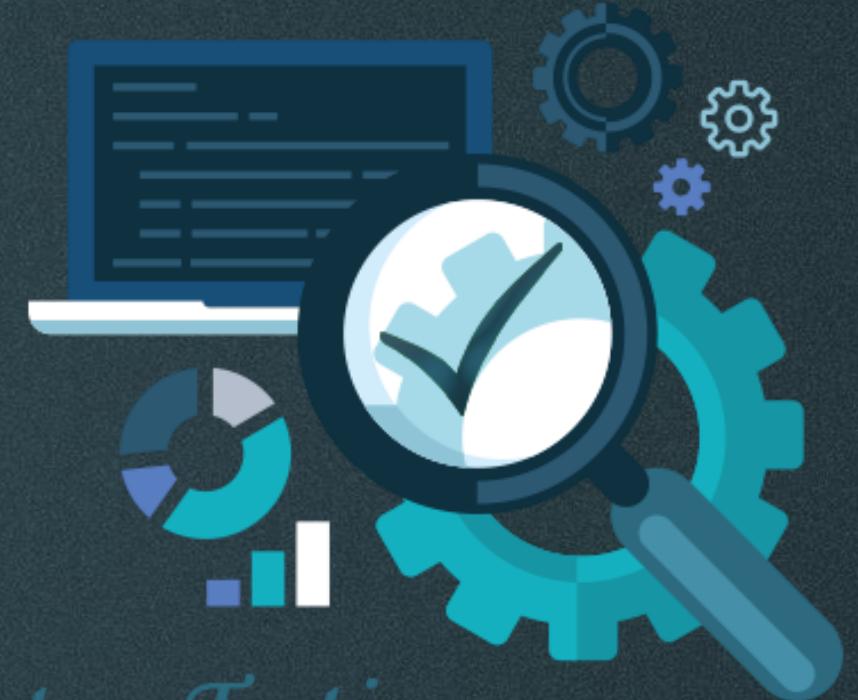


System Testing

System testing focuses on the behavior and capabilities of a whole system or product

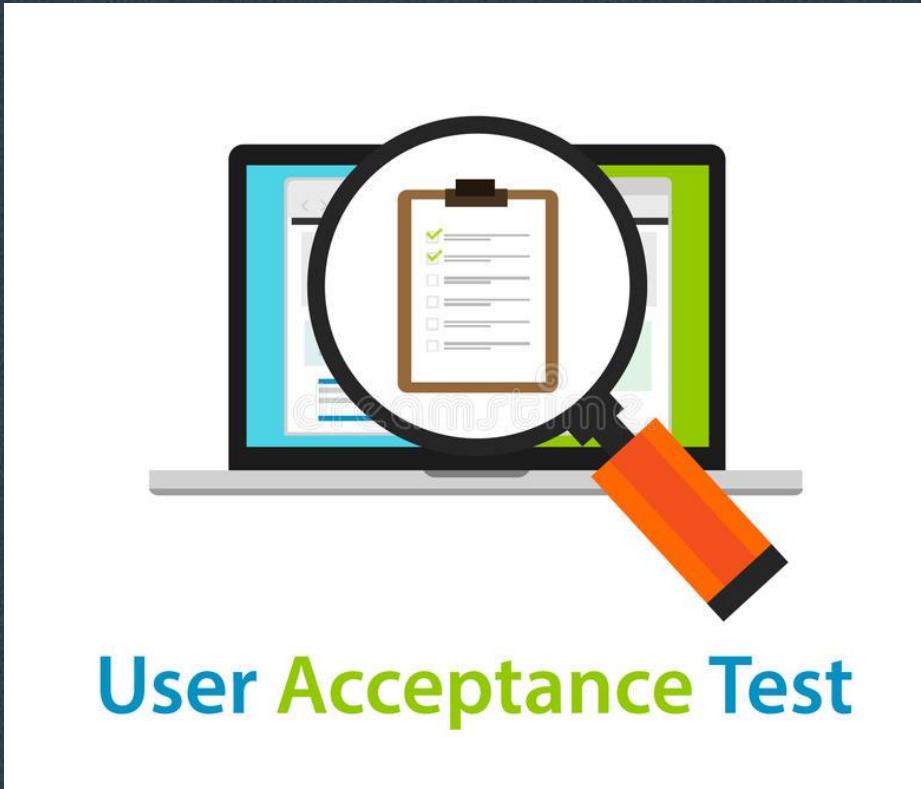
System Testing

- System testing often produces information that is used by stakeholders to make release decisions
- The test environment should ideally correspond to the final target or production environment
- System testing should focus on the overall, end-to-end behavior of the system as a whole
- Independent testers typically carry out system testing.



System Testing

Acceptance Testing



User Acceptance Test

Acceptance testing, like system testing, typically focuses on the behavior and capabilities of a whole system or product

Alpha & Beta Testing

- **Alpha Testing** is done inside the organization
- **Beta Testing** is done by users at their location



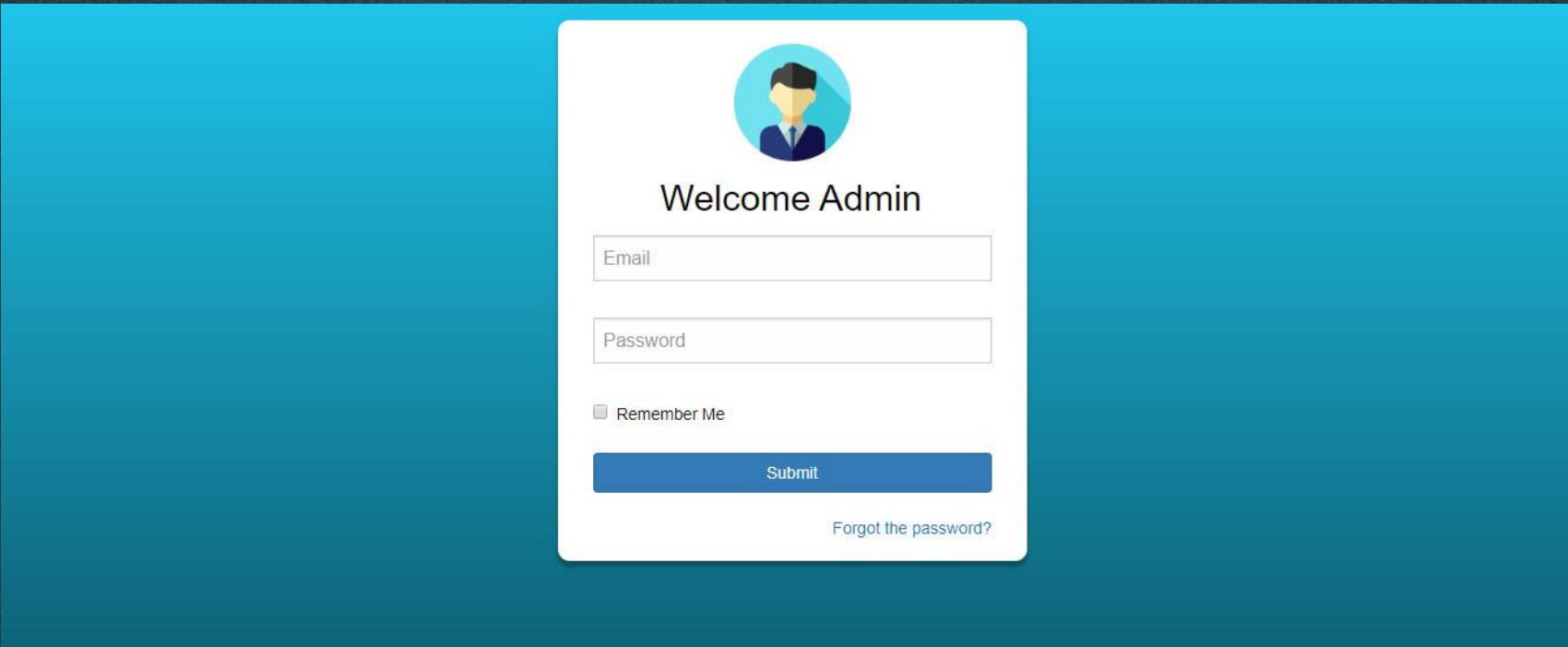


Testing Types

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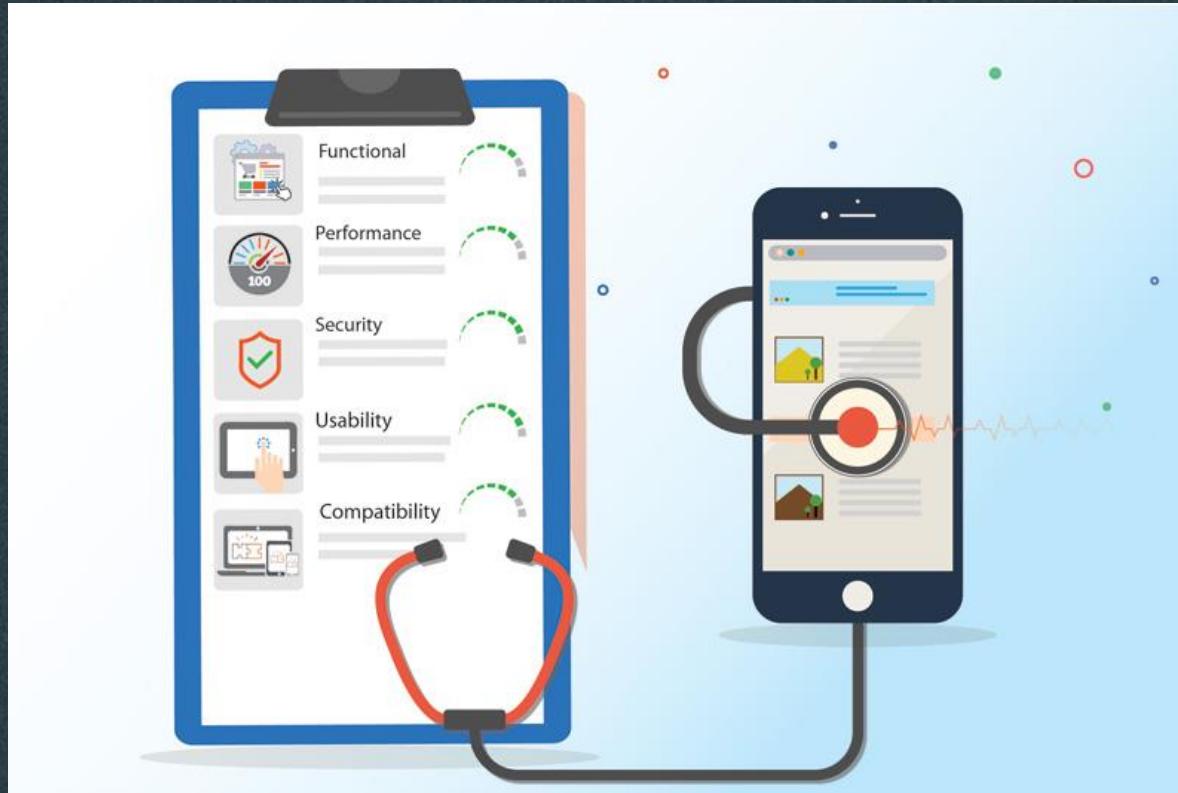


1-Functional Testing:



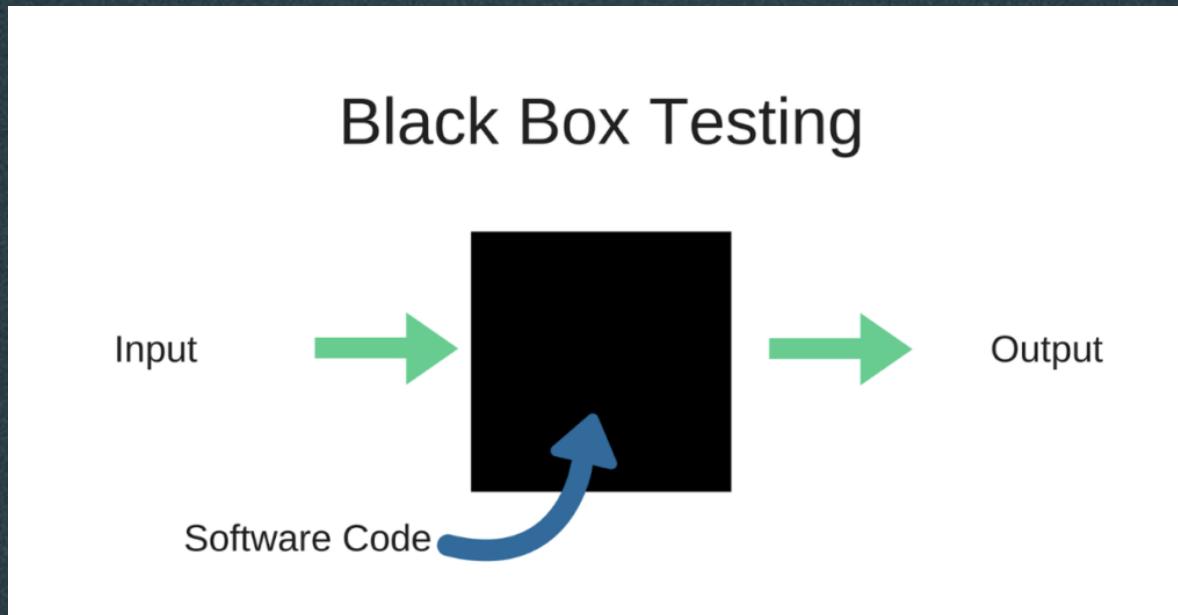
**-Testing what the system does
-Usually answered with (Yes/No)**

2-Non-functional Testing:



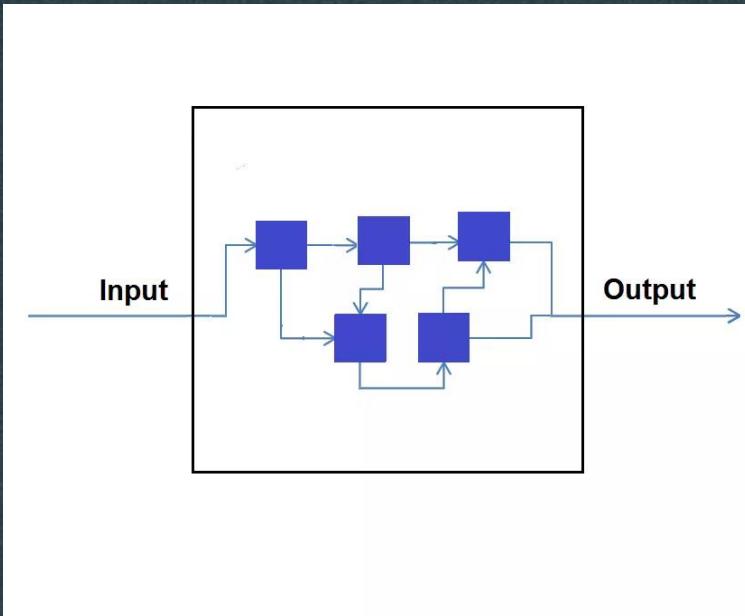
- Testing how the system performs
- Hard to answer with Yes/No
- Usually measured as a range

3-Black-Box Testing:



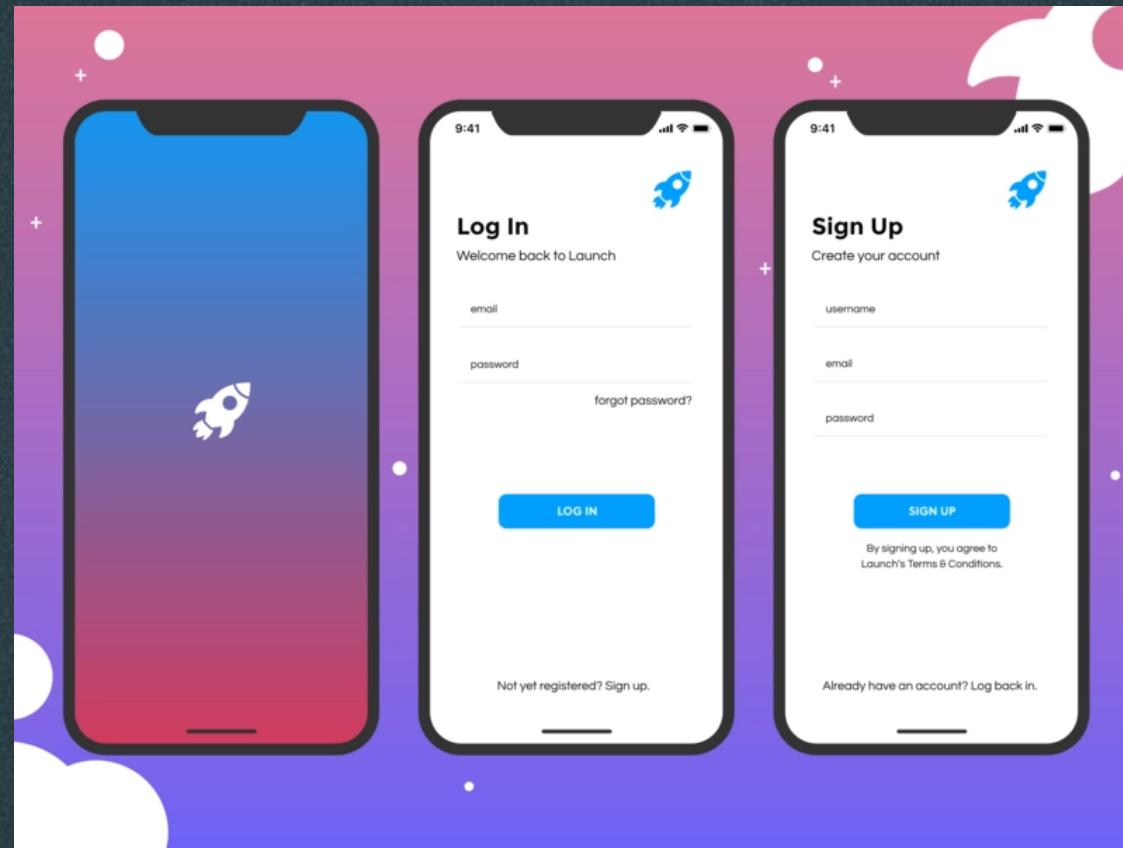
-Testing without knowing the internal structure of the system

4-White-Box Testing:



-Testing while monitoring the internal structure of the system

5-Dynamic Testing



-Testing that includes executing the software

6-Static Testing

- Testing that doesn't includes executing the software



"Please refrain from asking questions until the end because we have a lot of requirements to review today."

7-Retesting (Confirmation Testing)



Testing after debugging to ensure defects are fixed

8-Regression Testing



Testing unchanged areas to ensure they are not affected by changes

9-Smoke Testing



Testing main functionalities to ensure that the build is stable enough to continue testing

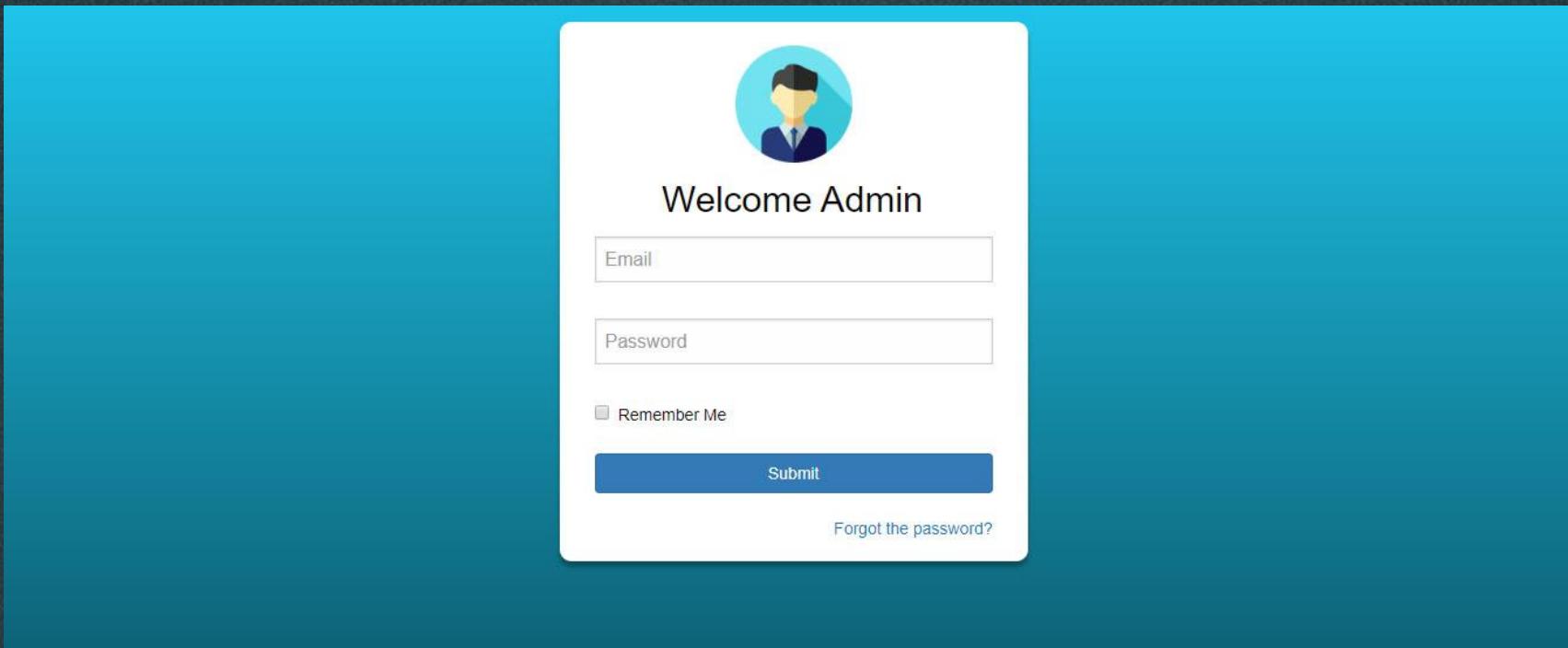


Test Case Writing

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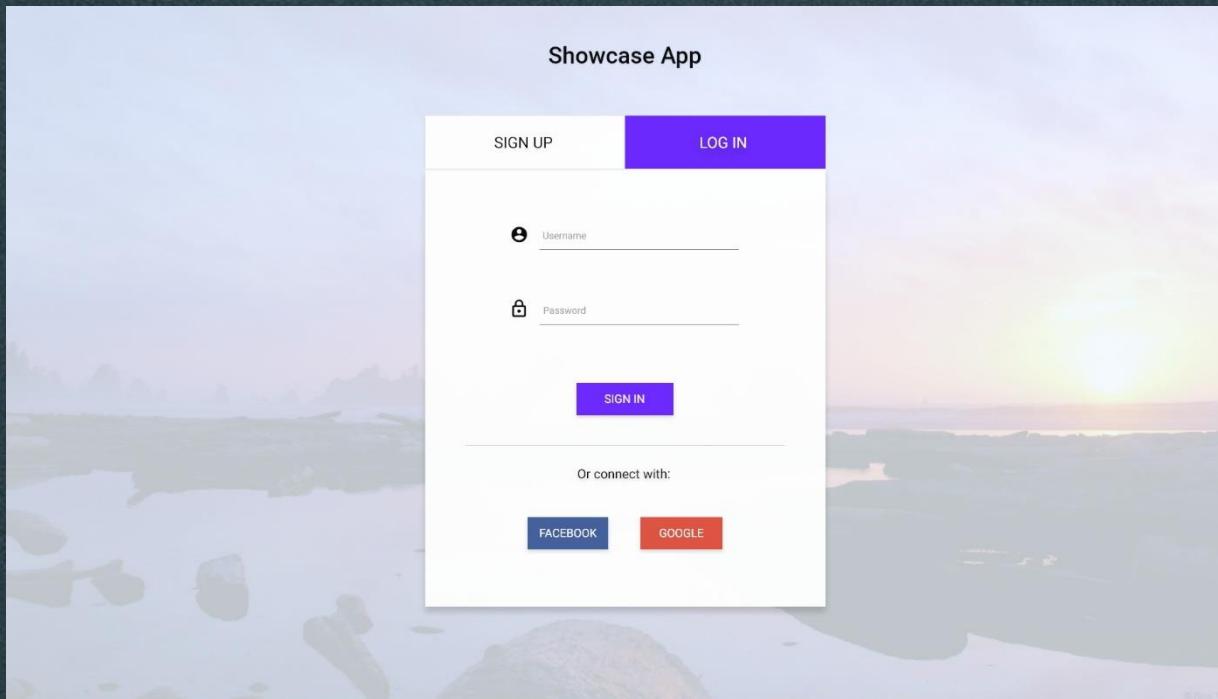
What is a test case?



A set of preconditions, inputs, actions (where applicable), expected results and postconditions, developed based on test conditions.

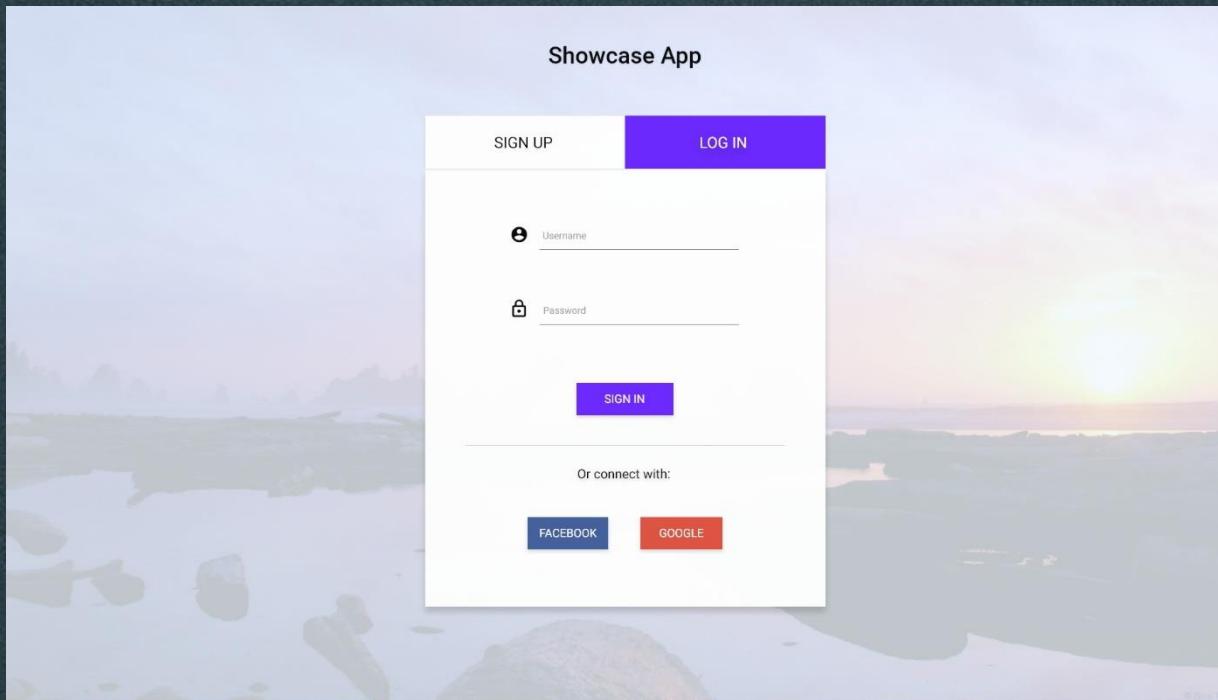
1-Test Case Title:

- Verify login with a valid username & password



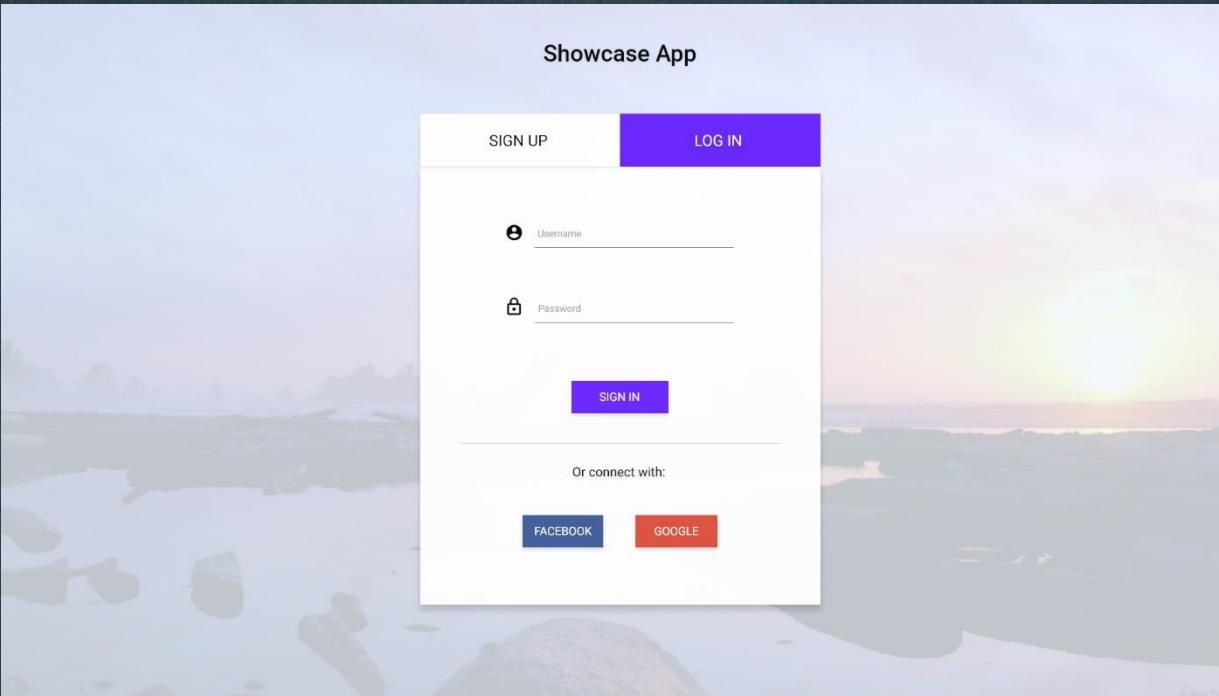
2-Precondition:

- User is already registered using valid credentials



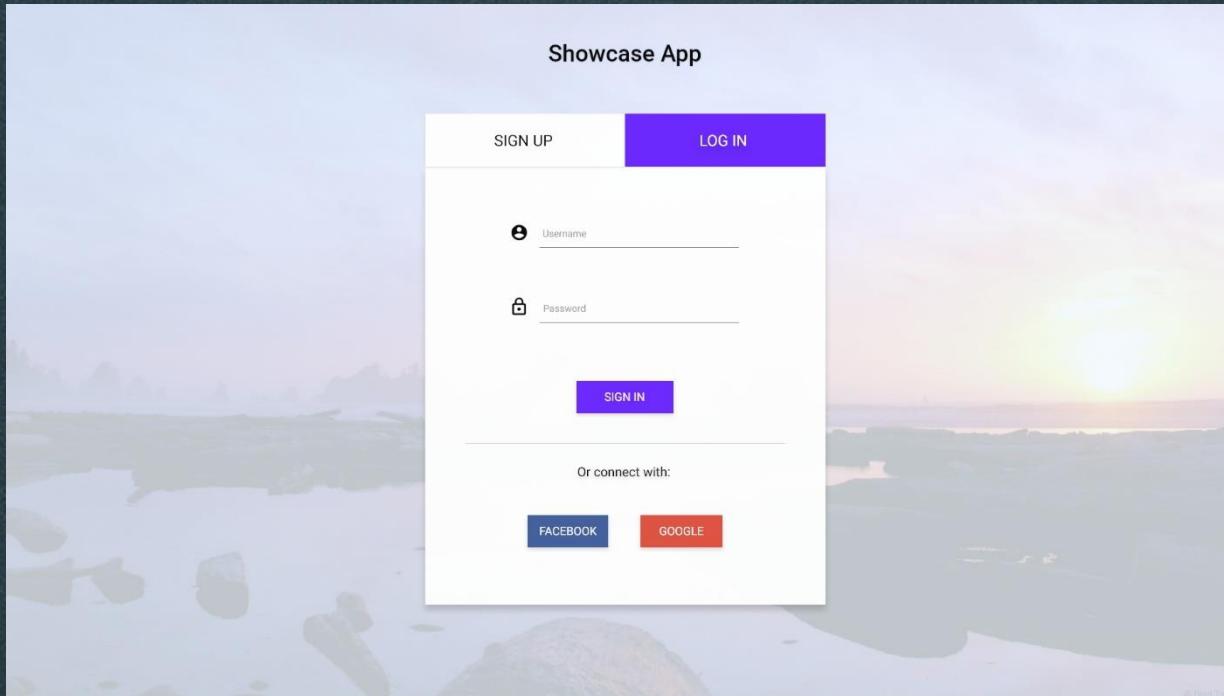
3-Test Steps

1. Enter a valid username
2. Enter a valid password
3. Click on sign in



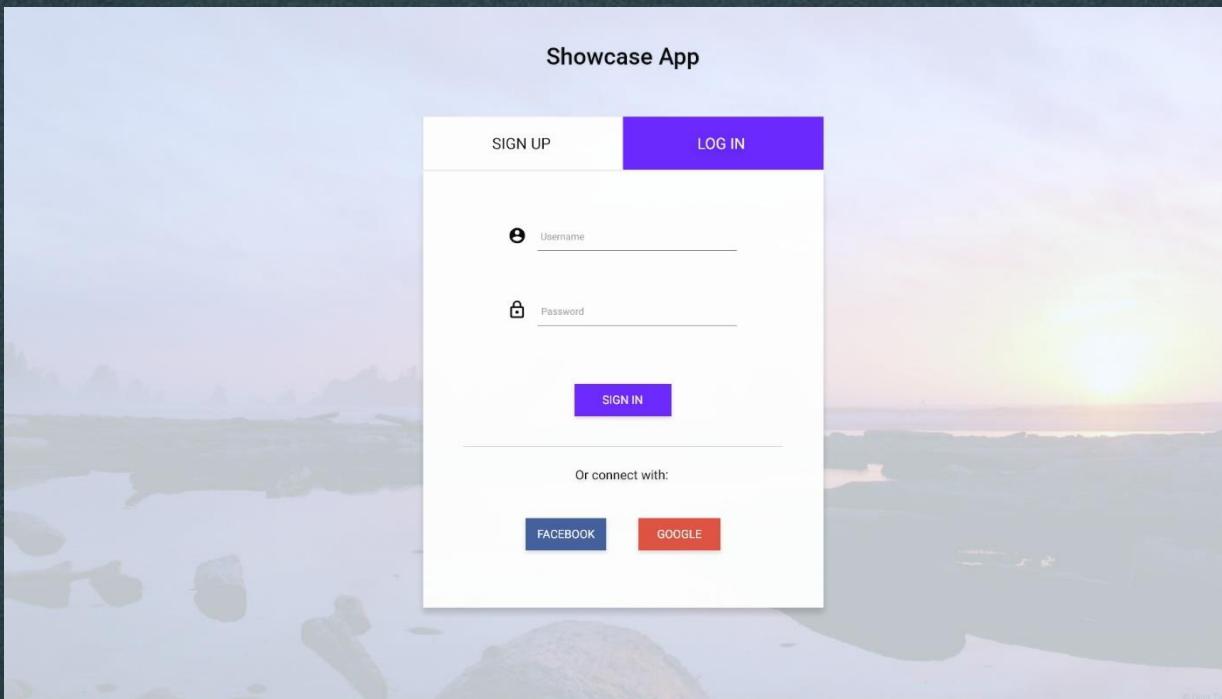
4-Expected result:

- User is logged in successfully and redirected to (XYZ) page



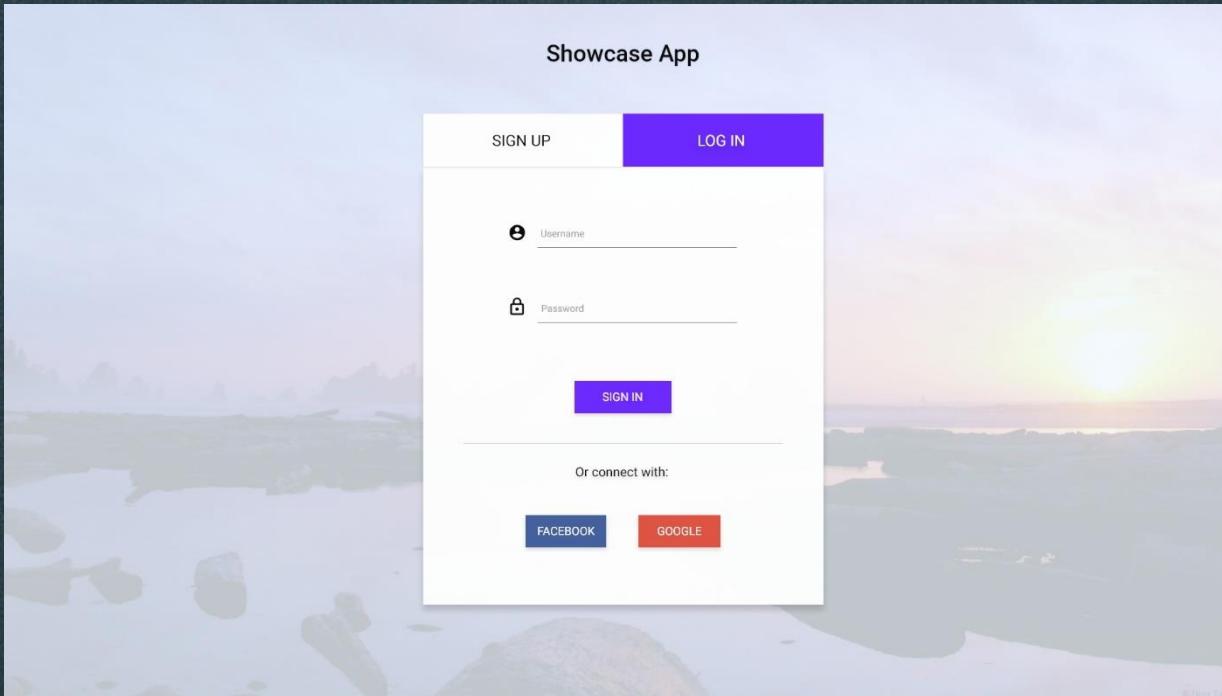
5-Test Scenario (Test Suite)

- Login



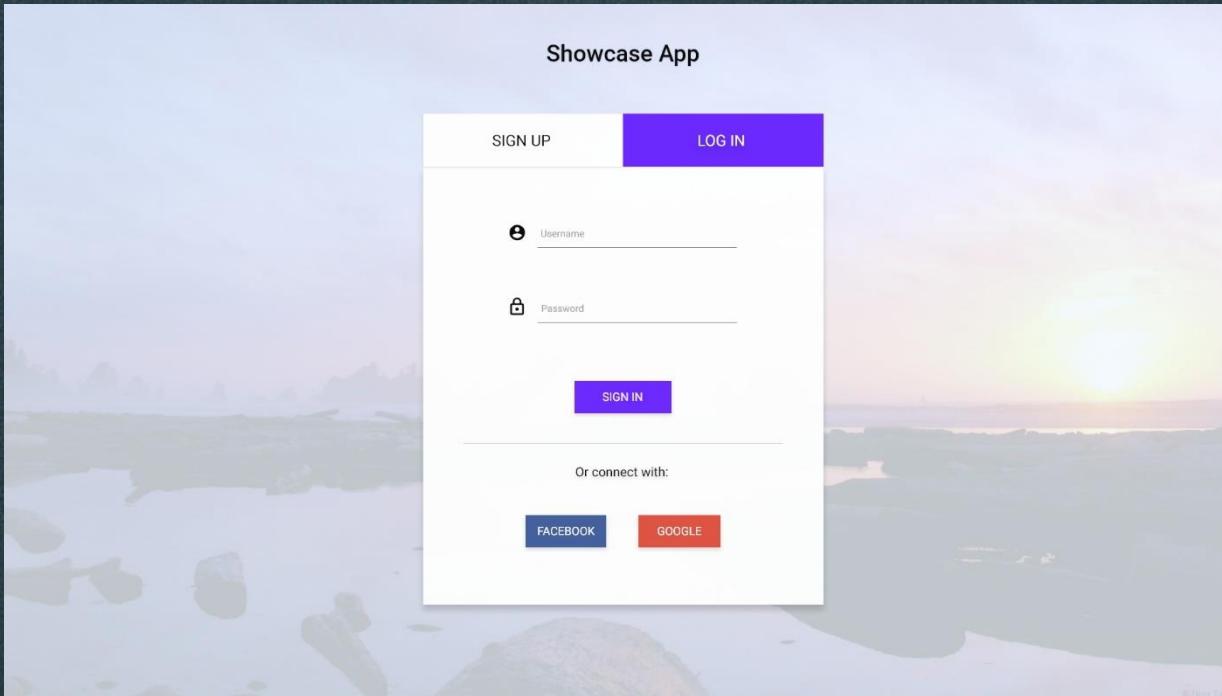
6-Test Environment

- Windows 10 - Chrome - Wi-Fi
- Samsung Galaxy Note 10 - Android 10 - 4G Network
- iPhone 11 - iOS 13.3.1 - 5G Network



7-Actual Result:

- Very important note: Never fill the actual result field until you execute the test case

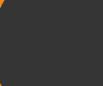


8-Status

New (Ready to test)	The test case is not executed
Pass	The test case is executed and the actual result is the same as the expected result
Fail	The test case is executed and the actual result is different from the expected result
Blocked/Skipped	The test case can't be executed

Example Test Case

Title	Login with a valid username & password
Precondition	User is already registered using valid credentials
Test Steps	<ol style="list-style-type: none">1. Enter a valid username2. Enter a valid password3. Click on sign in
Expected Result	<ul style="list-style-type: none">-User is logged in successfully-User is redirected to Home page
Test Suite	Login
Test Environment	Samsung Galaxy Note 10 - Android 10 - 4G Network
Actual Result	Same as expected
Status	Pass



Bug Report Writing

Created By: Tarek Roshdy



What is a defect report?



Documentation of the occurrence, nature, and status of a **defect**.

What is a defect?



An imperfection or deficiency in a work product where it does not meet its requirements or specifications. [Synonyms: bug, fault]

1-Bug Report Title:

- Section -> Description
- Register -> No error message appears when user leaves password field empty



2-Steps to reproduce:

- Must be very specific
- Ex:
 1. Open www.facebook.com
 2. Click on the hamburger icon in the upper left corner
 3. Scroll down to the bottom of the screen
 4. Click on Settings
 5. Click on data usage
 6. Change data usage to “minimum limit”

3-Expected Result:

- The same expected result like in the test case



4-Actual Result:

- What really happened when the steps are executed

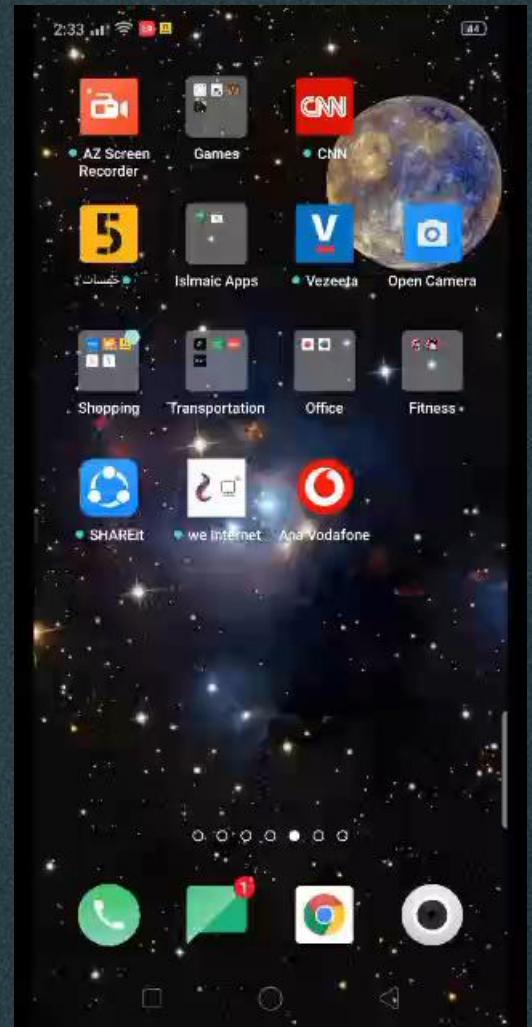
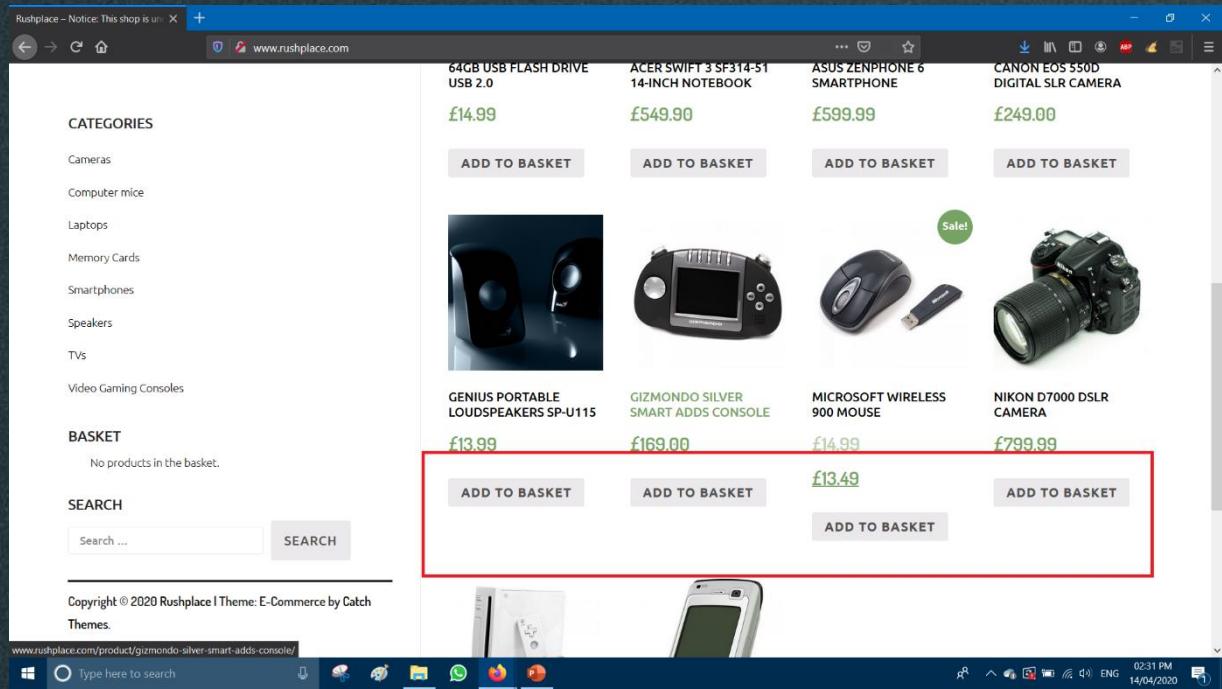


5-Test Environment

- Specify the environment(s) in which the defect occurred
 - Windows 10 - Chrome - Wi-Fi
 - Samsung Galaxy Note 10 - Android 10 - 4G Network
 - iPhone 11 - iOS 13.3.1 - 5G Network

6-Screenshot or video:

- The screenshot must show the whole screen
- A red rectangle should be around the defect area
- The video should show the clicks on the keyboard



7-Bug priority:

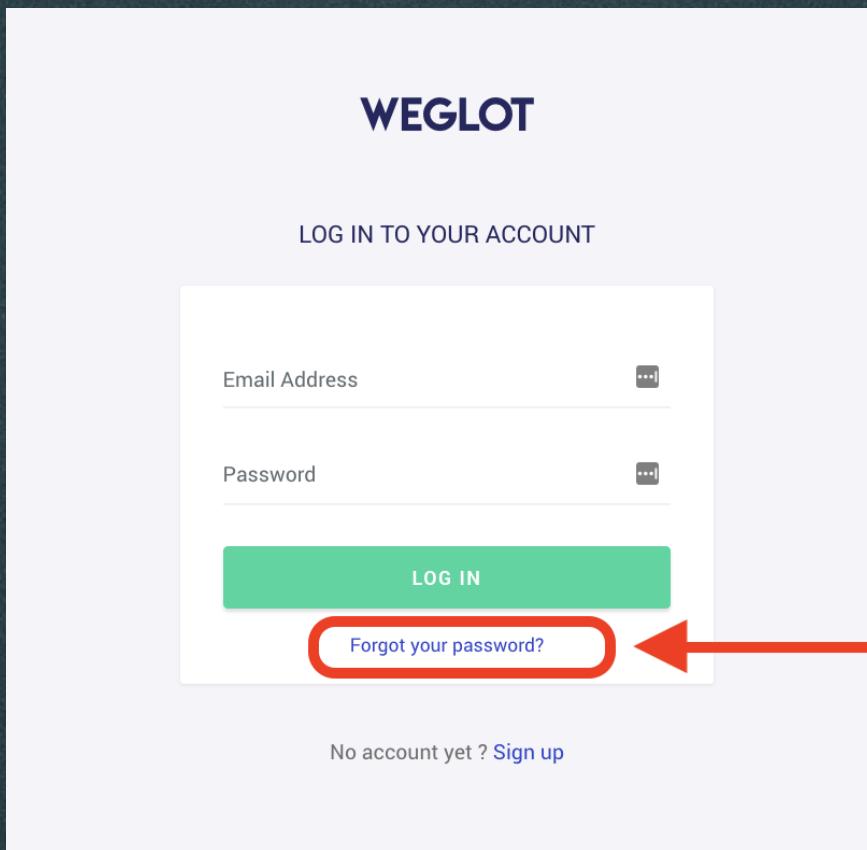
- **Critical:** Login isn't working-Application crashes in Home page - Wrong cart value
- **High:** Login page responds slowly - User is not able to add profile image
- **Medium:** Some pages have poor performance- Portrait mode isn't working correctly
- **Low:** Spelling mistakes - Image misalignment



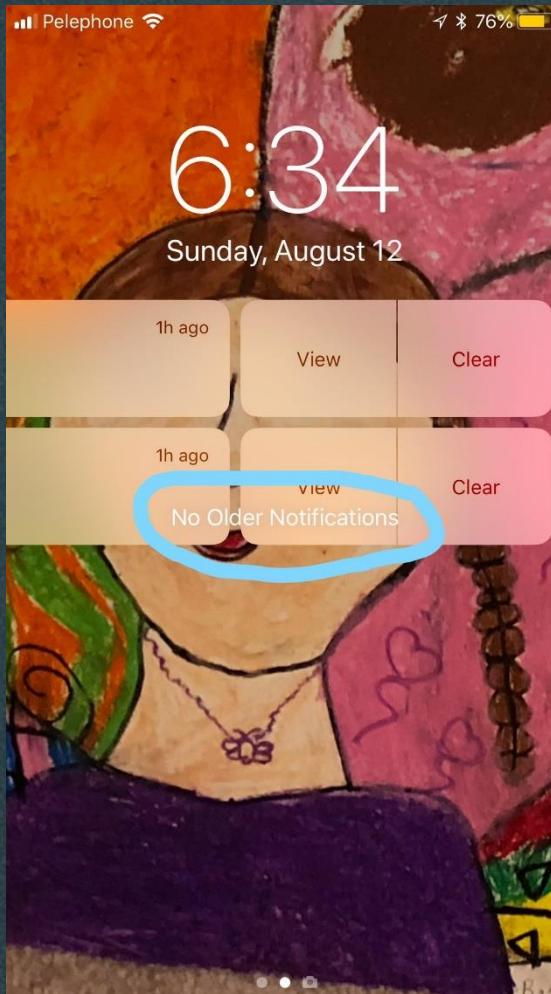
Defects' Types

1-Functional:

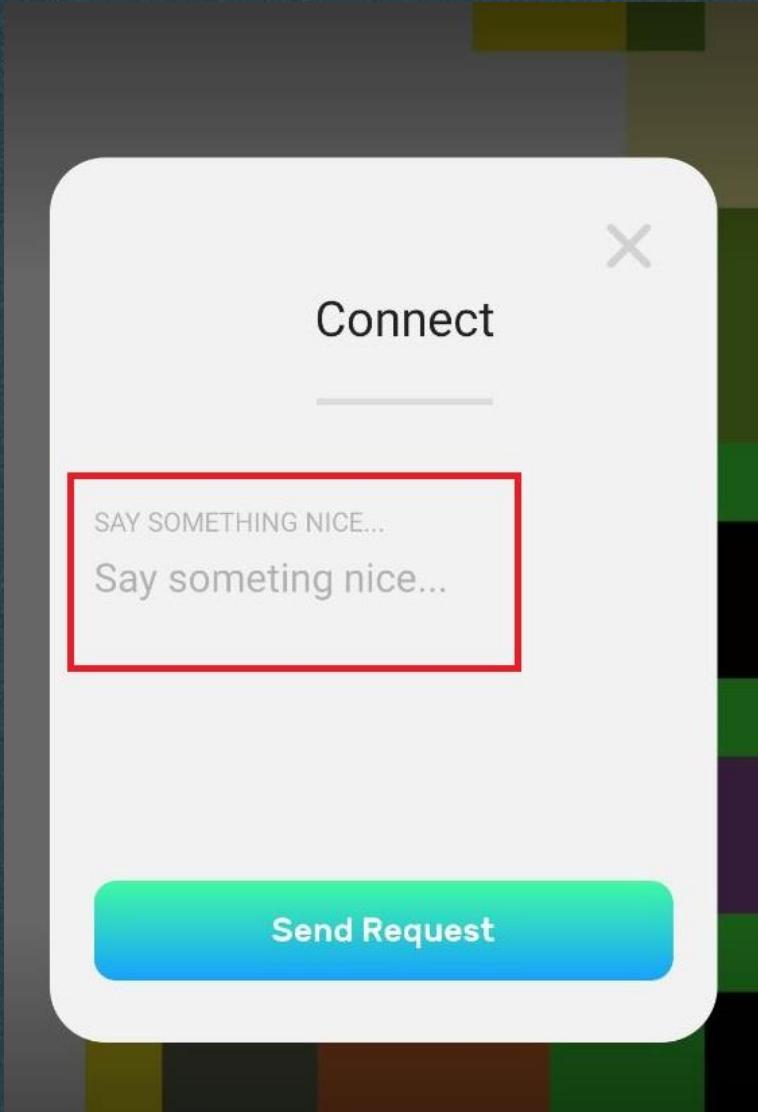
- Forgot password functionality isn't working



2-Visual (UI):

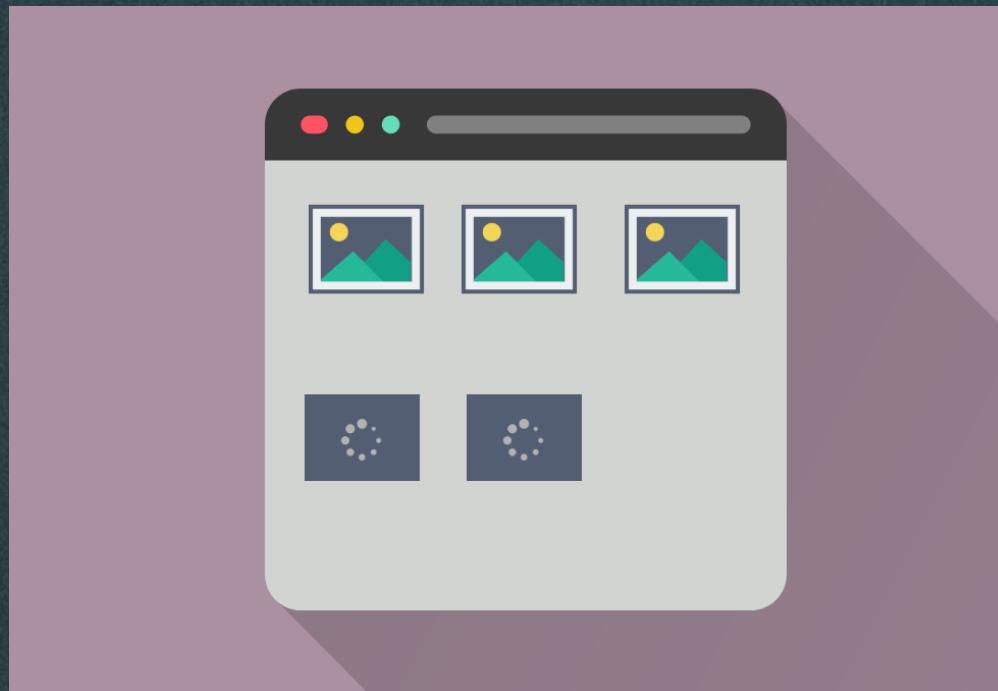


3-Content:



4-Performance:

- Videos take too much time to play



5-Suggestion:

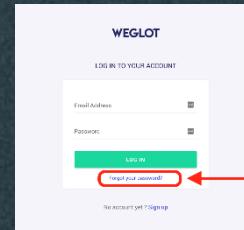
- The font of the placeholder should be bigger



8-Status

New (Ready to test)	The test case is not executed
Pass	The test case is executed and the actual result is the same as the expected result
Fail	The test case is executed and the actual result is different from the expected result
Blocked/Skipped	The test case can't be executed

Example Defect Report

Title	Login -> Forgot password button isn't working
Steps to reproduce	<ol style="list-style-type: none">1. Click on Login2. Click on Forgot password
Expected Result	The button can be clicked and user should be redirected to a page to enter his email
Actual result	Clicking on the button doesn't have any impact
Test Environment	Samsung Galaxy Note 10 - Android 10 - 4G Network
Priority	High
Type	Functional
Screenshot	 A screenshot of a login form titled "LOG IN TO YOUR ACCOUNT". It has fields for "Email Address" and "Password", and a "LOG IN" button. Below the buttons is a link "Forgot your password?". A red arrow points to this link.