TU856/3
SOFTWARE TESTING

LAB 1

10/02/2025

PAULINA CZARNOTA C21365726

2. REVISION: ERRORS, DEFECTS, FAILURES

2.a) The Mariner 1 Disaster

Error(s):

- A scientist incorrectly wrote the equation by omitting the bar over an "R," which altered the calculation.
- The coder copied the equation exactly as it was written, without verifying its correctness.

Defect(s):

- The incorrect equation was implemented in the flight-control code.

Failure(s):

- The spacecraft veered off-course because it used the incorrect value for the radius.
- The mission was terminated as ground control had to self-destruct the spacecraft.

2.b) The Image Upload Disaster

Error(s):

- The developer did not restrict file uploads to images only.
- Files were stored in a public directory instead of a private location.
- The database connection used a super-user (dba) account instead of a limited-access user.
- Password policies for database users were weak, using short and common passwords.

Defect(s):

- The website allowed any file type to be uploaded instead of only images.
- Uploaded files were accessible via direct URLs.
- The system granted super-user privileges to the web application instead of a lower-privileged user.
- No security measures, such as password hashing and validation**,** were implemented.

Failure(s):

- Testers uploaded a malicious script and executed it via a direct URL.
- The script was able to access database login credentials of multiple websites.
- Using weak passwords allowed attackers to gain access to multiple sites.
- The security team was able to compromise most of the websites on the server.

5. LECTURE 1 REVIEW

Create a Stormboard mapping out key concepts from Lecture 1. The key areas to cover are:

1. What is Testing? Why do we do it?

- **Definition:** Software testing is the process of evaluating and verifying that a software application meets the expected requirements.
- **Objectives of Testing:**
    - Detect defects before release.
    - Ensure software reliability and performance.
    - Improve software security.
    - Maintain customer satisfaction.
    - Reduce development and maintenance costs.

2. What are the different testing objects? Who creates them? Why do we need to test them?

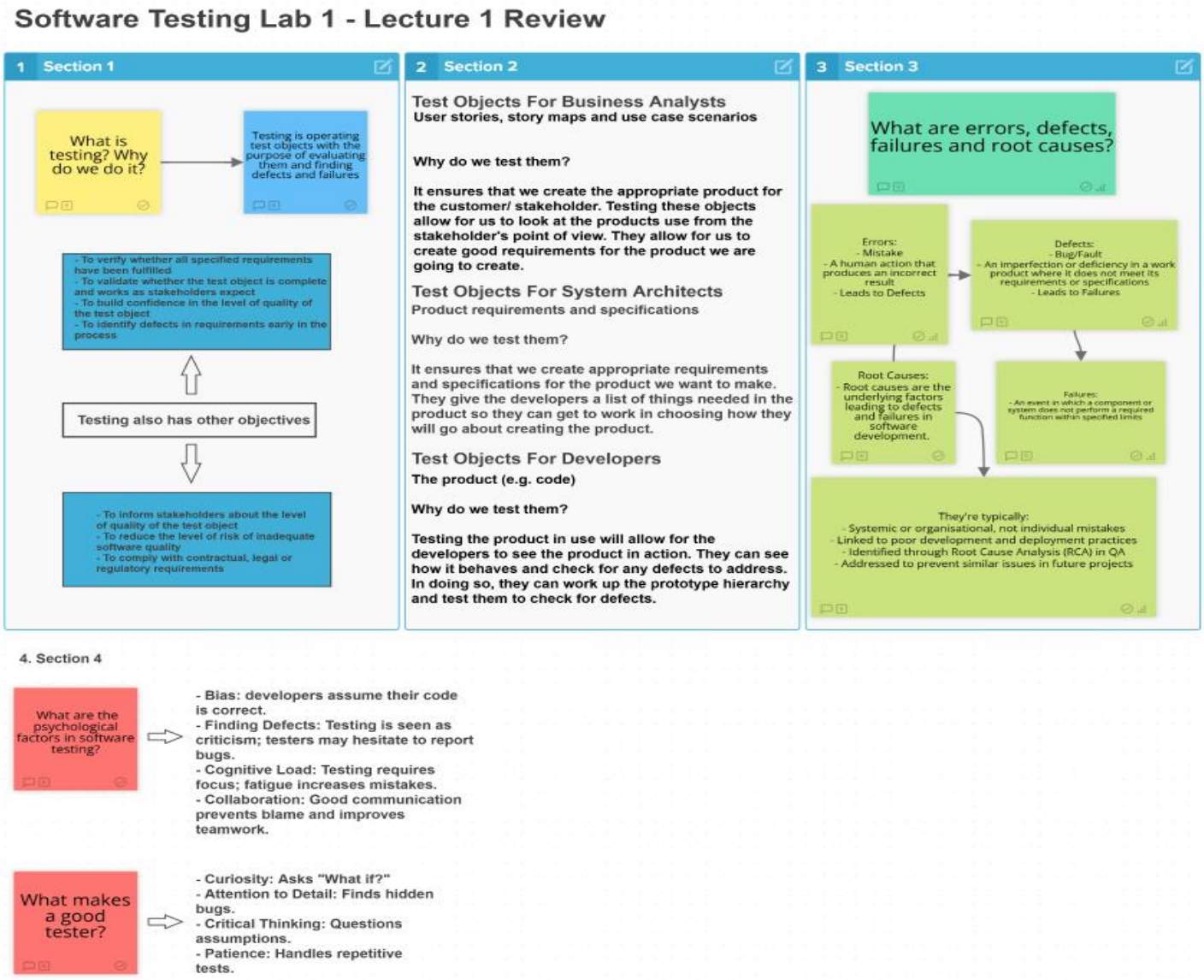
- **Testing Objects:**
    - **Code:** Created by developers and tested for logic errors.
    - **Requirements & Specifications:** Written by analysts, tested to ensure they are clear and complete.
    - **Design Documents:** Created by architects, tested for feasibility and consistency.
    - **User Interfaces:** Designed by UX/UI teams, tested for usability.
    - **Security Mechanisms:** Implemented by security engineers, tested for vulnerabilities.
- **Why Testing is Important?**
    - Prevents defects from reaching production.
    - Ensures functionality matches specifications.
    - Reduces financial and reputational risks.

3. What are errors, defects, failures, and root causes?

- **Errors:** Mistakes made during development (e.g., incorrect logic in an if-statement).
- **Defects (Bugs):** Errors that make their way into the code (e.g., incorrect calculation due to a missing formula).
- **Failures:** When a defect causes incorrect behaviour in the running system (e.g., a banking app calculating wrong interest).
- **Root Causes:** The fundamental reason why an error occurred (e.g., missing test case for a specific input scenario).

4. What are the psychological factors in software testing? What makes a good tester?

- **Psychological Factors in Testing:**
  - Developers tend to believe their code is correct and may overlook defects.
  - Testers need to adopt a skeptical mindset and actively search for issues.
  - Cognitive biases (e.g., confirmation bias) can lead to missed defects.
- **Qualities of a Good Tester:**
  - **Curiosity** – Always asking "What if?"
  - **Attention to detail** – Identifies subtle defects.
  - **Patience** – Debugging and reproducing errors take time.
  - **Creativity** – Thinks outside the box to find issues.
  - **Analytical skills** – Understands how different parts of a system interact.
  - **Communication skills** – Clearly documents and explains issues to developers.



Link to the Stormboard: https://stormboard.com/invite/1992178/swell726