CSE 565: Software Verification and Validation

Assignment 5: Graphical User Interface (GUI) Testing

Purpose

This assignment provides practical experience in GUI testing by applying testing concepts and experimenting with GUI automation tools. The primary objective is to evaluate a GUI testing tool's features and capabilities through hands-on experimentation.

Objectives

By completing this assignment, you will:

- Develop test cases to validate GUI elements and application page flows.
- Use GUI automation tools to perform automated testing, evaluate coverage, reuse test cases, and analyze test results.

Project Overview

In this project, you will work as a member of a testing organization for an IT company. Your manager has tasked you with researching and testing a GUI automation tool to assess its suitability for adoption within the organization. You will:

1. Create two versions of a GUI-based application.
2. Research and select a GUI testing tool.
3. Develop and execute test cases for both versions of the application.
4. Analyze the performance of the tool based on your experimentation.

Instructions

Task 1: Develop Two Versions of a GUI-Based Application

1. **Version 1**
    - Choose or create a GUI-based application (either a new application or an open-source one).
    - Code the application in any programming language.
    - Ensure the application includes at least three GUI pages with navigational flow between them.
    - Each page must include:
        - One or more **images, buttons, labels, and text boxes** (at least one of each element).

        - Any two additional GUI elements, such as a scrollbar, checkboxes, radio buttons, slider, list, or drawing components.
2. **Version 2**

- Create a modified version of the application with:
    - At least three changes to the GUI elements on each page (e.g., size, location, or orientation of elements).
    - A change in the navigational flow between pages (e.g., altering the order of page transitions).
    - Note: Changes in text or wording of GUI elements are not acceptable.

Task 2: Research and Select a GUI Testing Tool

- Research and identify a GUI automation tool suitable for creating and executing test cases.
- The tool should support functionalities such as testing GUI element existence, location, size, and flow between pages.

Task 3: Create Test Cases for Version 1

- Use the selected GUI automation tool to create and record test cases for **Version 1** of the application.
- Test cases should validate:
    - Existence of GUI elements.
    - Correctness of GUI element location, size, and content.
    - Navigational flow between pages.
- There is no minimum or maximum number of test cases required.

Task 4: Execute Test Cases on Version 2

- Use the same set of test cases created for **Version 1** and execute them on **Version 2** of the application.
- Record how many test cases pass or fail.
- Note: Some test cases may pass while others may fail due to differences in the GUI between the two versions.

Task 5: Assess the GUI Testing Tool

Provide a detailed evaluation of the GUI automation tool based on your experience. Address the following aspects:

- **Features and Functionalities**: Discuss the key features and capabilities of the tool.
- **Coverage**: Assess the extent of test coverage provided by the tool.
- **Test Case Reusability**: Evaluate the tool's ability to reuse test cases across different versions of the application.
- **Test Results**: Analyze the quality and clarity of the test results produced.
- **Ease of Use**: Reflect on the user experience, including setup, execution, and interpretation of results.
- **GUI Elements Supported**: Describe the types of GUI elements that the tool can effectively test.