Ira A. Fulton Schools of Engineering
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CSE 565: Software Verification and Validation

Graphical User Interface Testing Assignment

Purpose

This assignment provides an opportunity to apply concepts learned in the course and gain practical experience in GUI testing. The purpose of this project is to experiment with GUI testing tools.

Objectives

Learners will be able to:

- Develop test cases to validate GUI elements and page flows
- Perform automation testing using GUI testing tool's features, coverage, test case reuse, test results and usability.

Technology Requirements

- Any programming language

Project Description

Assume that you are working for a test organization for an IT company. Your test manager is asking you to research and experiment with a GUI automation tool that he/she might invest on and adopt in his organization based on your assessment and your experimentation.

In this project, you will complete the following tasks

1. You will develop a simple application with a GUI. You will have two versions of this application.
2. You will research and identify a tool for testing the GUI of your application.
3. You will develop test cases to validate the GUI of your application.
4. You will execute the test cases you developed for validating two versions of your application.
5. You will assess the tool's capabilities based on the your experimentation with the tool

Directions

This project requires you to use graphical user interface (GUI) testing techniques and tools for a software which has a graphical user interface.

Task 1

Develop two (2) versions of an application with a GUI:

- **Version 1**
  - Select any application of your own or an open source which has a graphical user interface.
  - The application can be coded in any programming language.
  - The application should have at least **three (3) GUI pages** and there should be flow from one page to another.
  - Each page is required for have:
    - one or more images, buttons, labels, text boxes. Every page should have **at least one of all** the GUI elements given.
    - any two of the following: a scrollbar, checkboxes, radio button, slider, list, drawing elements. You can select **any two (2)** of these elements to put on each page of your application.
- **Version 2**
  - You will need to have the same requirements as Version 1 but with **a minimum of three (3) changes** in the GUI.
  - You need to make a minimum of **three (3) changes in each of the three (3) pages** in the new GUI.
  - Acceptable changes are changes in the **size, location, orientation** of the GUI elements. Note that a change in the text or wording in a GUI element is **not acceptable**.

One additional change:

- The flow between pages will be created in Version 1 on the application.
- In Version 2 you have to change the order of flows between pages. You need to change a **minimum of one (1) flow** in the new GUI.

Task 2

- Research and identify a tool for testing GUI of an application. The tool will be used to create test cases and for executing them.

Task 3

- Select any GUI test automation tool to record your test cases and report out the test results
- Create and record test cases for testing the **Version 1 of the GUI**.
- Test cases should be developed to test the existence of a GUI element, correctness of its location, the size of the element, content of the GUI element and the correctness of the link (flow from page to another).
- There is no specification for a minimum or maximum number of test cases.

Task 4

- Execute the same set of test cases for the **Version 2 of the GUI**.
- Report out how many of the test cases passed or failed when used for the second version of the GUI. Note that some test cases might fail and some might still pass during the execution of the test cases on the second version of the GUI.

Task 5

- It is important you make an assessment of how well the GUI automation tool has performed during your interaction with this tool in this project. Provide an detailed assessment of the tool in your own words in terms of:
    - set of features and functionalities provided
    - type of coverage
    - reuse of test cases
    - test results produced
    - ease of usage
    - type of GUI elements that can be tested

Submission Directions for Project Deliverables

This assignment requires submission of **two (2)** deliverables that should be submitted, **a ZIP file and a PDF report**. You will submit your work at the assignment submission page.

ZIP Deliverable

Your **ZIP file** should be titled **yourlastname_firstname_CSE 565_GUITestAssignmentFiles.zip** and contain:

1. The **source code** of two versions of your application.
2. **Test cases** created using the tool you selected (submit them in their original format).

PDF Report

Your **PDF report** should be titled **yourlastname_firstname_CSE 565_GUITestAssignmentReport.pdf**, formatted in APA/MLA style, and contain:

1. a description of the application **with screenshots** for the GUIs (one GUI for Version 1 and other one for Version 2).
2. a description of the tool selected for GUI testing **explaining its features, scope and area of usage.**
3. **a description of the test cases developed** by the student explaining the coverage of the test cases.
4. **an explanation of the test results** after test execution. Explain pass/failed test cases by referencing screenshots in the report. (Do not only insert a screenshot, and expect us to make sense out of it. Explain what that screenshot is showing).
5. an **assessment** of the tool (in your own words) in terms of its
    a. set of features and functionalities provided
    b. type of coverage
    c. reuse of test cases
    d. test results produced
    e. ease of usage
    f. type of GUI elements that can be tested
6. a list of the references used.
7. **Do not submit the tool you used** (including any executables or installation files) Refer to the web site where you downloaded in your report as a citation in your report.

Submission Guidelines

You may submit your deliverables as many times as needed. However, only the most recent submission will be graded.

You must submit each of the assignment files in their designated submission spaces. Learners may **not** email or use other means to submit any project for review, including feedback, and grading.

Evaluation

You will be evaluated on the criteria (**worth 100 points total**):

- **Development of the two GUIs of an application as per requirements (15 points)** - Develop and describe
    - Version 1 GUI as per requirements
    - changes that are made to Version 2 GUI as per requirements

- **Description of the tool selected for GUI testing (5 points)** - Describe the GUI testing tool, explaining its features, scope and area of usage.

- **GUI test case design (15 points)** - Develop test cases testing:
    - GUI elements as per requirements
    - the flow of GUI pages as per requirements

- **GUI test case execution (15 points) -** Execute test cases on two (2) versions of the GUI
    - Insert test execution report
    - Describe test cases failed and passed

- **Assessment of GUI testing tool (40 points)** - Review the GUI test tool (in student's own words) in terms of:
    - set of features and functionalities provided
    - type of coverage
    - reuse of test cases
    - test results produced
    - ease of usage
    - type of GUI elements that can be tested