CIS 4150 Assignment 3 Part 2

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**Q1) Explain the benefits of automation**

The benefits of automation include:

Reduction of testing effort: Software could be hundreds of thousands of lines long, executing them all manually takes lot of effort and time. Automating testing and creating testing suits helps reduce load on the tester

Reduces the testers’ involvement in executing tests: Automating test suites frees up the testers times to do other things.

Facilitates regression testing: Regression testing is the most time-consuming process. Automating it reduces time, effort, and strain on the developer.

Avoids human mistakes: Manually testing allows more errors. Testers may be tired or in a hurry and cut testing short so automating it makes sure testing is constant.

Reduces overall cost of the software: Reducing the time it takes to test software lowers the cost of the man hours required to build the software. This lowers the software cost

Simulated testing: It’s very hard to load test if you’re manually testing, but automated testing can easily test thousands and millions of concurrent users. So manual testing is useful for this.

Internal testing: There could be a need for testing for memory leaks or coverage of testing. To check this manually is very cumbersome and time-consuming, so automating this is useful.

Test Enablers: Automating using stubs and drivers while development is still taking places allows more thorough and effective testing as you can test while development is still taking place.

Test case design: Automated tools can be used to design test cases. This can guarantee better coverage than if it was to be done manually.

**Q2) Explain why static and dynamic automation testing tools are needed**

Static tools are needed because they perform Control flow analysis, Data use analysis, interface analysis, and path analysis. Control flow analysis detects loops with multiple exists and entry points and unreachable code. Data use analysis detects all types of data faults in the program. Interface analysis detects all interface faults. It also detects function which are never declared and/or called and function results that are never used. Path analysis defines all possible paths through a program and unravels the programs control flow.

Dynamic testing is needed because during testing, multiple operations can be running concurrently, when this happens it can be hard to anticipate conditions and create test cases. Automated test tools can help testers capture the state of events during the execution of a program by preserving a snapshot of the conditions. These program monitors list the number of time a component is called. Reports on whether a decision point has branched in all directions by providing info about branch coverage. Report summary stats on providing a high-level view of the percentage of statements, paths and branches that have been covered by the collective set of test cases.

**Q3) What is selenium, and what are the pros of Selenium**

Selenium is an open source project that offers a range of tools and libraries for browser automation. It provides a playback tool for authoring functional tests across modern web browsers without the need for learning a test scripting language.

The pros of Selenium

* Free and open source
* Easy to use and install
* No programming experience is required (Though HTML and DOM knowledge is needed)
* Can export tests to formats
* Has built-in help and test results reporting module
* Provides support for extensions

**Q4) Write an example code using selenium.webdriver module to find elements using the find\_elements methods by name/id/class\_name after inspecting a website of your choice.**

This script goes to the website “techwithtim”, searches for the keyword test, then clicks onto the gear page.

from selenium import webdriver

from selenium.webdriver.common.by import By

from selenium.webdriver.common.keys import Keys

PATH = "./chromedriver"

def automator():

driver = webdriver.Chrome(PATH)

driver.get("https://techwithtim.net")

print(driver.title)

search = driver.find\_element(By.NAME, "s")

search.send\_keys("test")

search.send\_keys(Keys.RETURN)

header = driver.find\_element(By.ID, "menu-item-2262")

header.click()

print(driver.page\_source)

automator()