Web Automation using Selenium Web driver Python

V.Neethidevan, G.Chandrasekaran

Abstract— Software companies are more committed to produce more quality software systems with lower costs. Software tested by a separate testing team, more quality is in built. Earlier manual testing was done and now a days due to more complexity in the software to be developed, there is a need for automation of testing. Using automated testing tools like Selenium, GUI testing and Cross Browser testing and Web automation is done more effectively. There is a nned for more skills from the test engineers to perform more effective testing. In this paper we performed Web Automation testing using Selenium web driver Python. The web based application is tested with Selenium web driver with Python code. Cross Browser testing is done with the various leading browsers to check performance of applications as expected.

Keywords: GUI testing, Selenium testing tool, Cross browser testing, Functional testing, Web Automation.

1. INTRODUCTION

Always GUI part of any software systems is more important, since through which user interact with systems. Once the software developed with user friendliness, more users will be attracted towards the usage of software system. With good user interface, a user gains the control on a software application or hardware device.

Each software applications developed for various purposes, have a graphical user interface, or GUI. GUI is a must for all users, so that it could be easy for them to work with software application. They need not memorize the various command options and its syntaxes. With GUL consistency is maintained for various components of software system. The various common elements like, text boxes, frames, labels, buttons etc makes the user more comfortable in working with the system.

2. IMPORTANCE OF UI TESTING

The user interface testing consumes more time because it has more number of elements and more time is dedicated for this by the development team.

To better understand the concept of User interface testing, the testing team members must understand the various specification of system. That is why, testing should start from day one itself. Similar to involvement of customer in all phases of software system, this team also should be involved from day one.

Revised Version Manuscript Received on March 08, 2019.

V.Neethidevan, AP(SLG) - MCA Department, Mepco Schlenk Engg. College, Sivakasi, Tamil Nadu, India. (e-mail: neethidevan@mepcoeng.ac.in)

G.Chandrasekaran, Director-MCA Department, Mepco Schlenk Engg. College, Sivakasi, Tamil Nadu, India. (e-mail: gchandra@mepcoeng.ac.in)

3. BEST PRACTICES FOR DESIGNING AN INTERFACE

To design a good interface for any software system, developer must have deeper knowledge about customer usage pattern. Once the user requirements are very well understood, use the following guidelines to design the user interface.

- ***Design with simple interface.*** If the interfaces are simple, user feel comfortable in working with the system. .
- ***Use consistency in UI Design elements*** use common elements in the design of UI, users show very eager to work the system and complete the work in a faster manner.
- ***Design the layout with more specific.*** The layout used in the UI must have consistency so that user need not memorize the various commands. Once the simple layout is used, more useful information can be easily grasped by the users.
- ***Systematically use color and texture.*** If more colors are used, users gets more attraction towards the application..
- ***Use design to show hierarchy and simplicity.*** Careful usage of typeface is a must. Use of different fonts with different sizes for different set of sections for more clarity in readability.
- ***Ensure that the user is understanding about what's happening.*** User must be informed about the location, actions, changes in state, or errors when working with the application. The various UI elements must notify status and, and reduce anticipation of the user.
- ***Think about the defaults and system may offer default values so that user load reduced.*** Don't forget to provide default value for different UI element, so that various input given by the user can be reduced. .

4. Web Automation

It is a process by which, certain operations are performed in an iterative manner, to ensure the correctness of application's functionality.

In Cross Browser Testing, the main objective is to ensure the applications performs its intended operations across different browsers.

Each and every software system needs to perform multi-browser testing to ensure that the indented functionality is perfectly performed in all browsers.

Since we have a wide market across globe and lot of browsers are available, each user is interested in opening web application on their choice. The testing engineer has ensure that the various components like JavaScript, AJAX requests, Applets, Flash, Flex etc. may be working properly in each browser. Each application has to be tested with different browsers to ensure no issues in running the application.

5. LITERATURE SURVEY

In [1], Shauvik Roy Choudhary et al, discussed about various issues related to the use of different browsers in web applications. To solve this tester needs more understanding about the tools to be used for testing. The tool – WEBDIFF proposed by the author, detects the above said problems automatically and reports them to the developer. This tool also helps in UI design Svetoslav Ganov offered a new approach to obtain input data and compute event sequences that maximizes code coverage of a GUI application in [2]. Since the GUIs have become pervasive, the testing part remains slowly .

Imran Ali Qureshi conducted a srvey on various test case generation techniques; The outcome of this survey provided a comparative chart with pros and cons of each technique in [3].

In [4], Isabella1and Emi Retna , recommended the notion to examine techniques used for test data generation and process for various GUI applications. GUI based testing is needed as it act as an interface between users and the application. .

NajmehVatankhah et al, conducted a survey by studying existing systematic mapping (SM).Method: The SM is performed using the guidelines given by Petersen et al. They devised a classification scheme and map the selected articles to this scheme[5]. In [6] Milan Jovic et al, analyzed the existing GUI testing approaches to validate the functional correctness of interactive applications. As users are expecting more user friendly applications, their performance as perceived by the human user is growing in importance. In [7], Reena Saini ,explained the importance of GUI design and the process of designing GUI. Design the GUI application with more focus on user friendlessness.

In [8], Suman et all, gave more focus for GUI testing, which is most essential for system usability, robustness and safety. To improve the overall performance of the system, testing must be done. If the application is designed with low user interface, may lead to many problems. GUI tests will be performed from end user point of view.

In [9], RituPatidar et al, contributed the study which includes theoretical aspects about various software testing techniques, a discussion of different testing tools and its working by taking practical example. They analyzed that how the test cases are prepared and applying in software application through manual and automation testing.

In [10], XunYuan et al, established various set of coverage criteria for GUI testing . The primary aim of this is that they allow to accommodate “context” into the criteria in terms of event combinations, sequence length etc . for each event.

In [11], Pedro Luis Mateo Navarro developed a new approach to automate the generation of GUI Test Cases and Validation. It is directed by use cases describing the GUI behavior, recorded as a series of interactions with the application widgets. In [12], Amber Wagner presented an abstract of techniques used in GUI testing. Voice user interface testing methods are also reviewed. In [13], G. Mohan Doss Gandhi et al, analyzed different methods of identifying/diagnosing User Interface controls in automated testing process of various GUI elements. In 14], Isabella et al examined many techniques that will be used to generate test cases.

In [15], Tsung-Hsiang Chang et al, presented a novel method to GUI testing. The testers write test scripts to identify the GUI components to interact and feedback to be observed. While recording input events and screen images, opportunity to extract the images of various components interacted.

In [16], Ali Mesbah et al, modeled the problem of cross-browser compatibility issues for web application performance for various web browsers and found automated solution for it.

6. EXPERIMENTAL WORK & RESULT

Selenium web driver

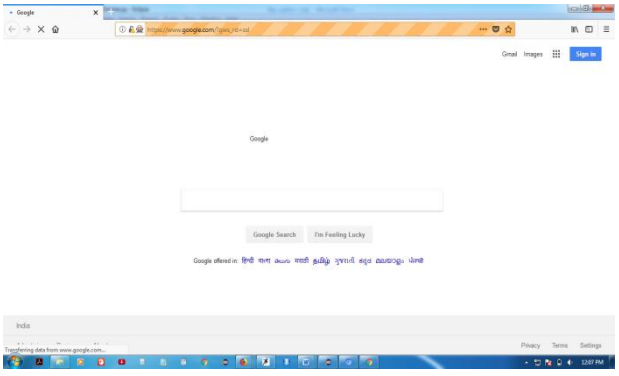
Selenium is a open source testing tool and it has web automation framework, used to perform automated website testing. It has the capability to do more automation work to simplify the testing process by the test engineer.

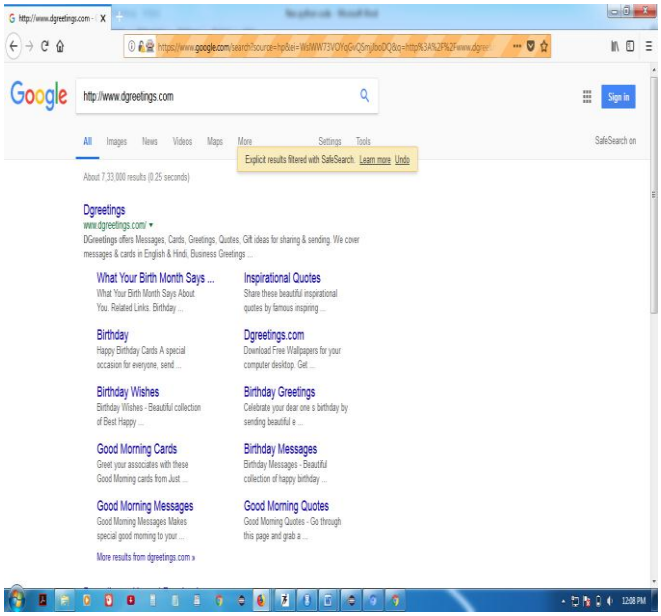
In this work, we performed both user interface testing and cross browser testing using Selenium web driver concepts using Python code. The script we developed has invoked

The implementation part consists of code written using Selenium Python web driver for Cross Browser testing and GUI testing.

The GUI testing validates each web page is properly loading in each browser and the alignment of various GUI elements like text box, label box, combo box etc in each web page. When cross browser testing is done the tester is looking for validating CSS and HTML scripts, web page and font size validation for various popular web browsers.

Screen shots of results for Firefox Web Browser





CONCLUSION

This paper described about how to perform GUI testing techniques for web based applications and the role of Selenium web driver Python in Web Automation. Also discussed about the importance of Cross Browser testing and implemented using Chrome and Firefox browsers.

REFERENCES

1. V.Neethidevan, G.Chandrasekaran, Database Testing using Selenium Web Driver – A Case Study, International Journal of Pure and Applied Mathematics Volume 118 No. 8 2018, 559-566..
2. G.Chandrasekaran, V.Neethidevan, Software Testing using Automated Tools, M/s Vandana publications, Lucknow, 2018.
3. Shauvik Roy Choudhary, Detecting Cross-browser Issues in Web Applications, ICSE '11,May 21–28, 2011, Waikiki, Honolulu, HI, USA.
4. SvetoslavGanov, ChipKillmar, Sarfraz Khurshid, Test Generation for Graphical User Interfaces, Based on Symbolic Execution.
5. Imran Ali Qureshi and AamerNadeem, GUI Testing Techniques: A Survey, International Journal of Future Computer and Communication, Vol. 2, No. 2, April 2013
6. Isabella1and Emi Retna, STUDY PAPER ON TEST CASE GENERATION FOR GUI BASED TESTING, International Journal of Software Engineering & Applications (IJSEA), Vol.3, No.1, January 2012.
7. Najmeh Vatankhah1, KohTieng Wei2* and Sukumar Letchmunan3, Ishan Banerjee a, Bao Nguyen a, VahidGarousib,c,⇑, AtifMemona, Graphical user interface (GUI) testing: Systematic mappingand repository, Information and Software Technology 55 (2013) 1679–1694.
8. Milan Jovic, Matthias Hauswirth, Performance Testing of GUI Applications,
9. ReenaSaini, Graphical User Interface Design Essentials & Process, Volume 3, Issue 9, September 2013.
10. Suman, Dr. R.S.Chhillar, A Review: GUI Testing, IJCSMC, Vol. 3, Issue. 5, May 2014, pg.875 – 878.
11. RituPatidar, Anubha Sharma, Rupali Dave , Survey on Manual and Automation Testing strategies and Tools for a Software Application , Volume 7, Issue 4, April 2017 .
12. Xun Yuan, Member, IEEE, Myra B. Cohen, Member, IEEE, and Atif M Memon, Member, IEEE, GUI Interaction Testing: Incorporating EventContext,
13. Pedro Luis Mateo Navarro, Diego Sevilla Ruiz, Gregorio Mart´ınezP´erez, Automated GUI Testing Validation guided by AnnotatedUse Cases, Departamento de Ingenier´ıa de la Informaci´on y lasComunicacionesDepartamento de Ingenier´ıa y Tecnolog´ıa de ComputadoresUniversity of Murcia, 30.071 Murcia, Spain.
14. Amber Wagner Computer Science Department, University of Alabama, A Comparison of GUI and VUI Testing.
15. G. Mohan Doss Gandhi and Anitha S. Pillai, Challenges in GUI Test Automation, International Journal of Computer Theory and Engineering, Vol. 6, No. 2, April 2014
16. Isabella1and Emi Retna, Study Paper On Test Case Generation Forgui Based Testing, International Journal of Software Engineering & Applications (IJSEA), Vol.3, No.1, January 2012.
17. Tsung-Hsiang Chang, Tom Yeh, Robert C. Miller, GUI Testing Using Computer Vision, UMIACS & HCIL University of Maryland.
18. Ali Mesbah, Mukul R. Prasad, Automated Cross-Browser Compatibility Testing, ICSE'11, May 21–28, 2011, Waikiki, Honolulu, HI, USA.
19. http:// www.appperfect.com/ services/web-testing/cross-browser-testing.php
20. https://afourtech.com/cross-browser-testing-tools/

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication