STQA Mini-Project 2

Title:

Automated Testing of Application

Problem Definition:

Create a small web-based application by selecting relevant system environment / platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Narrate scripts in order to perform regression tests. Identify the bugs using Selenium WebDriver and IDEand generate test reports encompassing exploratory testing.

Software Requirements:

NodeJs, MongoDB, selenium-server-standalone-3.13.0
Chromedriver.exe, JAVA 1.8, Chrome Selenium extension, Google Chrome 83+, JUnit

Hardware Requirement:

8GB Ram

Learning Objectives:

1. To understand automate testing and prepare test cases.
2. To understand different types of testing.
3. To understand different automation tools
4. To test web application using selenium

Learning Outcomes:

Students will be able to:

1. Prepare test cases and automate testing of web applications.
2. Understand different types of testing paradigms.
3. Understand different testing tools and how to use them

Theory:

Selenium :

- Selenium is a portable framework for testing web applications. Selenium provides a tool for authoring functional tests without the need to learn a test scripting language.
- It also provides a test domain-specific language to write tests in a number of popular programming languages, including C#, Groovy, Java, Perl, PHP, Python, Ruby and Scala.
- The tests can then run against most modern web browsers. Selenium runs on Windows, Linux, and macOS.

Selenium WebDriver :

- Selenium WebDriver is a collection of open source APIs which are used to automate the testing of a web application. Selenium WebDriver tool is used to automate web application testing to verify that it works as expected.
- It supports many browsers such as Chrome, Firefox, IE, and Safari.Selenium Webdriver is platform-independent since the same code can be used on different Operating Systems like Microsoft Windows, Apple OS and Linux.

Advantages :

- Selenium is an Open Source Software.
- Selenium supports various programming languages to write programs (eg : C#, Groovy, Java, Perl, PHP, Python, Ruby and Scala).
- Selenium supports various operating systems (Windows, Linux, Mac OS)
- Selenium supports various Browsers (Mozilla Firefox, Google Chrome, IE, Opera, Safari)
- Selenium supports Parallel Test Execution.
- Selenium uses less Hardware resources.

Disadvantages :

- It supports Web based applications only.
- No reliable technical Support.
- Difficult to use, takes more time to create Test cases.
- Difficult to Setup Test Environment when it compares to Vendor Tools like UFT, RFT, SilkTest.
- No Test Tool integration for Test Management.

Selenium Tools:

- Selenium IDE
- Selenium client API
- Selenium Remote Control
- Selenium WebDriver
- Selenium Grid

What is TestNG?

- TestNG is a powerful testing framework, an enhanced version of JUnit which was in use for a long time before TestNG came into existence. NG stands for 'Next Generation'.
- TestNG framework provides the following features −
    - Annotations help us organize the tests easily.
    - Flexible test configuration.
    - Test cases can be grouped more easily.
    - Parallelization of tests can be achieved using TestNG.
    - Support for data-driven testing.
    - Inbuilt reporting.

Functions :

- click(*on_element=None*) : Clicks the element which denotes the on_element element. It is default None which means it clicks on the current mouse position.
- manager() : It returns an instance of underlying implementation of

interface options which could be EventFiringOPtions . Options give access to the browser menu .

- __init__(*driver*) : Creates a new ActionChains.
- click_and_hold(*on_element=None*) : Holds down the left mouse button on an element .It is default None which means it clicks on the current mouse position.
- pause(*seconds*) : Pause all inputs for the specified duration in seconds.
- perform() : Performs all stored actions.
- reset_actions() : Clears actions that are already stored locally and on the remote end.
- accept() : Accepts the alert available
- Dismiss : Dismisses the alert available.
- Text : Gets the text of the Alert.
- Move_to_element(*to_element*) : Moving the mouse to the middle of an element .

Locate elements By:

- CLASS_NAME = 'class name'
- CSS_SELECTOR = 'css selectors'
- ID = 'id'
- LINK_TEXT= 'link text'
- NAME = 'name'
- PARTIAL_LINK_TEXT = 'partial link text'
- TAG_NAME = 'tag name'
- XPATH = 'xpath'

JUNIT:

JUnit is a unit testing framework for the Java programming language. JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks which is collectively known as xUnit that originated with SUnit.

Web Application Developed:

Abstract:

It is observed that the process of applying for internship application is hectic and lengthy for students. The teachers also face problems when it comes to maintaining a record of the applications and checking the documents' validity. This is the reason we came up with a digital paperless solution to reduce this tedious process of applying for internship applications and NOC letters. IMS is a web application developed for the students and teachers of PICT to ease their workload and have a digital, paperless and effective way of managing applications and maintaining their record.

Scope:

- To test a web application using a selenium tool .
- The actions determined by the actor can be simulated on the system using selenium and no real actor is required.
- If the test cases pass the appropriate conditions,the action is carried out successfully .
- On the other hand if it fails there is a flaw in the system for that particular action.
- Thus we determine the proper working of the system using selenium testing tool

Technology Stack: MERN stack (MongoDB, Express, ReactJs, NodeJs), Java, Selenium Drivers, Junit

Testing Type: Automation testing

Team:

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Sahil S. Patil (41250)
Pralhad A. Kulkarni (41254)

Features:

- Login
- See and update profile
- Check all faculty members - get list and count
- Check all Applications - get list and count
- Search Faculty Member
- Delete a particular faculty member

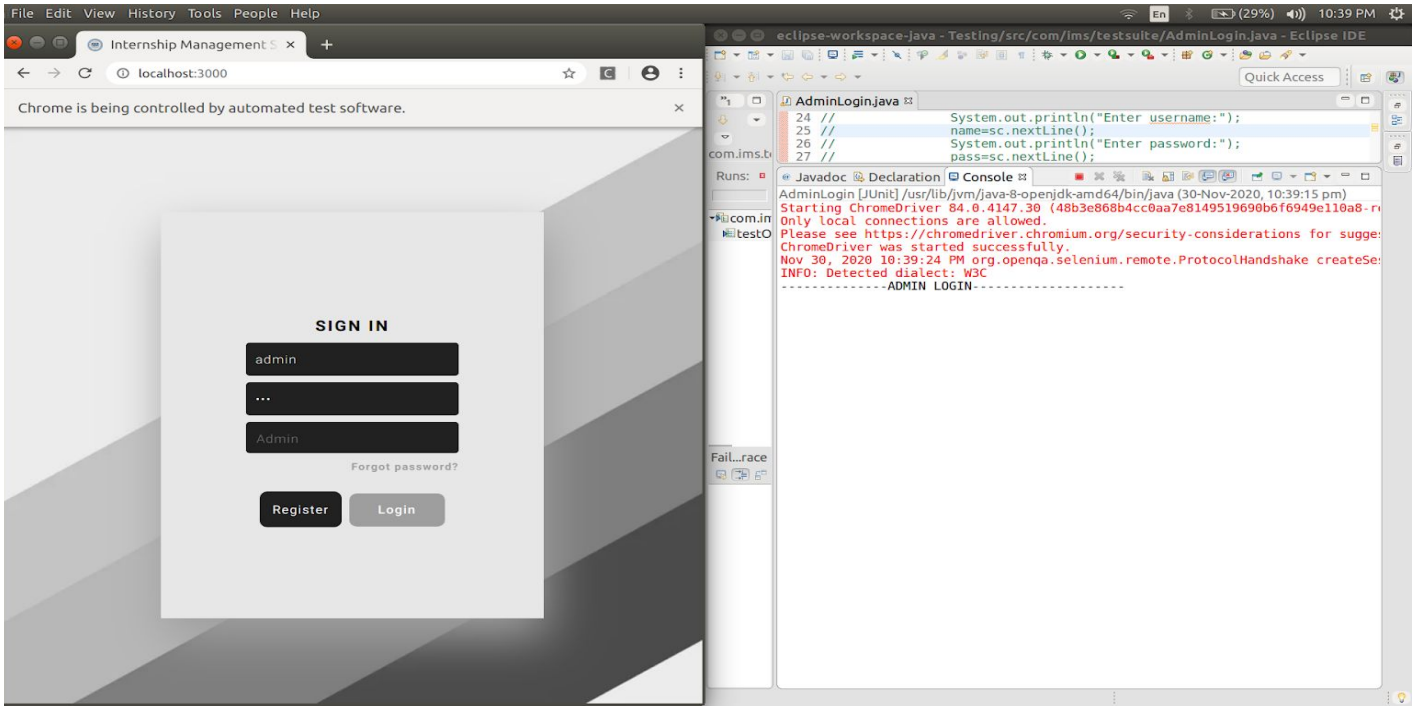
Steps:

1. Download Eclipse IDE.
2. Download the Selenium driver https://www.selenium.dev/downloads/ according to your requirement.
3. Download and Extract chromedriver.exe for windows on any drive of computer. http://chromedriver.chromium.org/downloads.
4. Extract the zip and note down the path.
5. Now Open Eclipse IDE → Create Java Project → Right Click Project Name → Properties → Java Build Path → Libraries → Add External JAR → add selenium-server-standalone-3.13.0 jar → Apply and Close.
6. Write your code in a .java file and run the application.
7. Junit can be used to bundle test cases and run them accordingly.

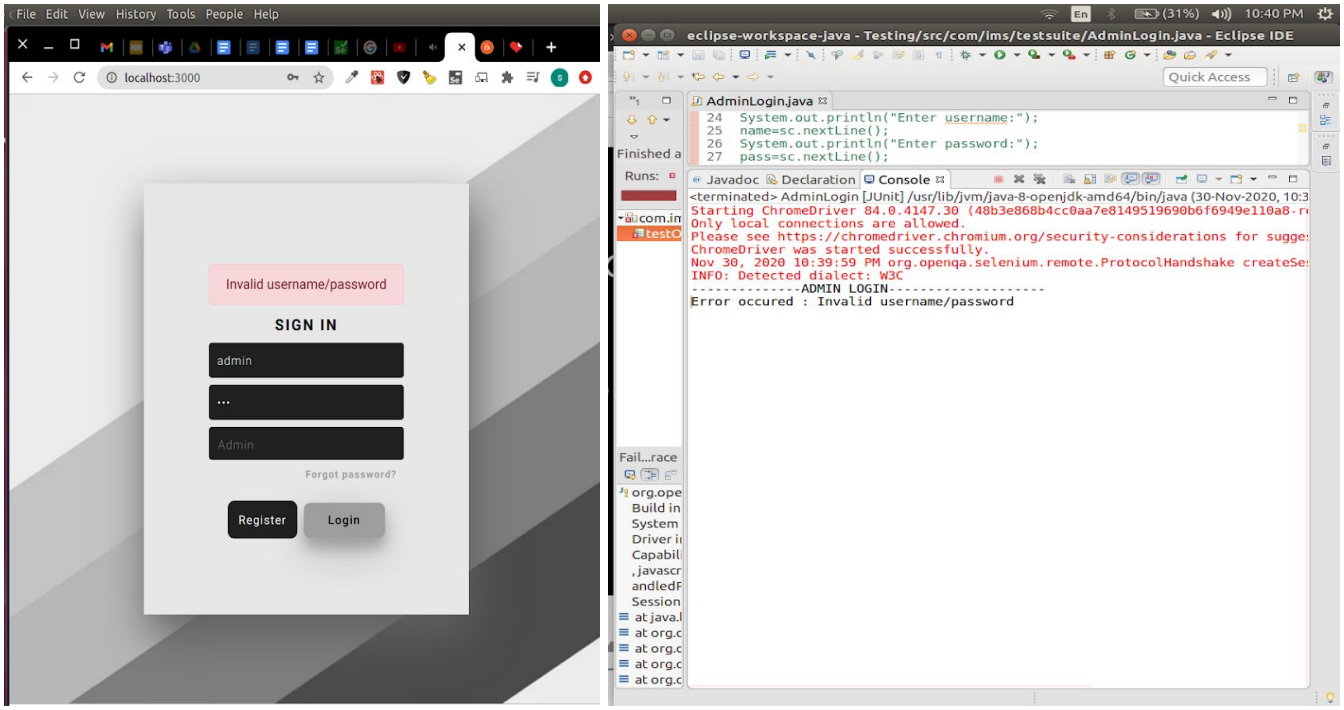
Test Cases:

LOGIN

Passed Test Case for login

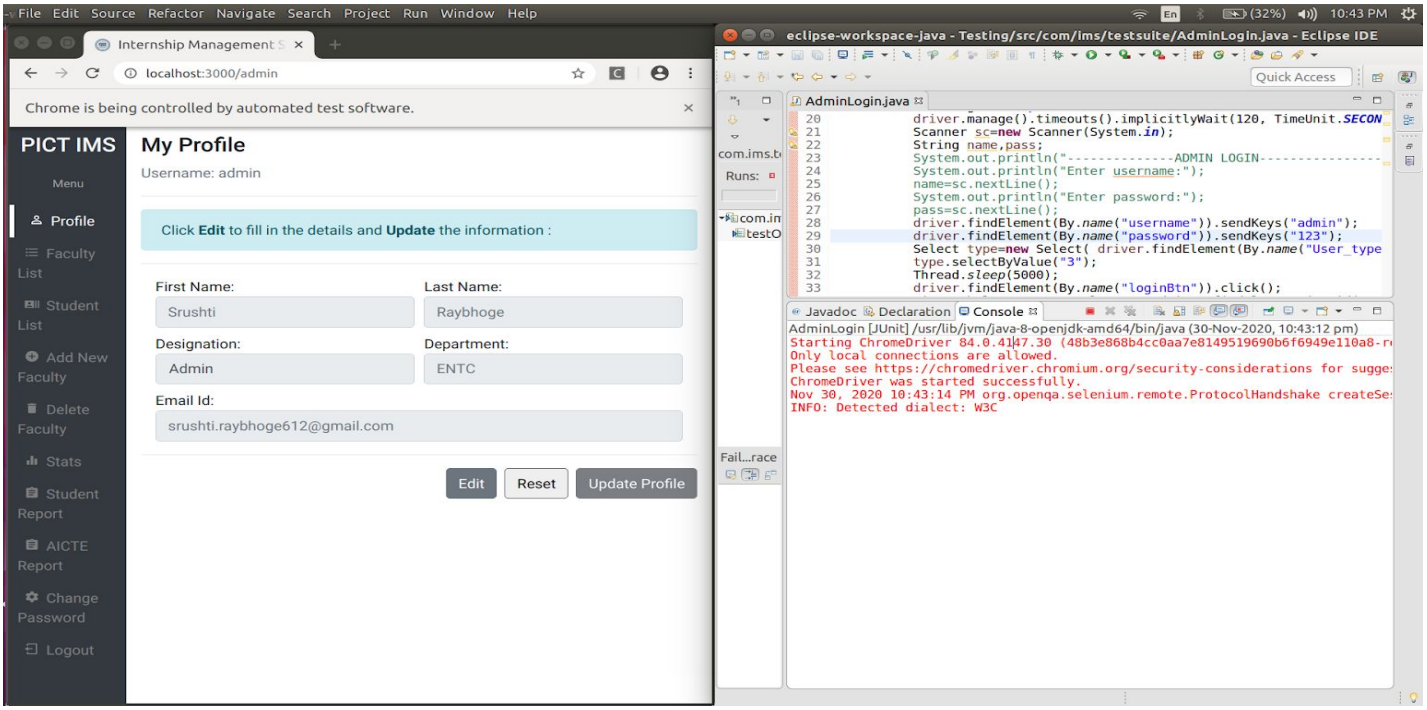


Failed Test Case for login



UPDATE

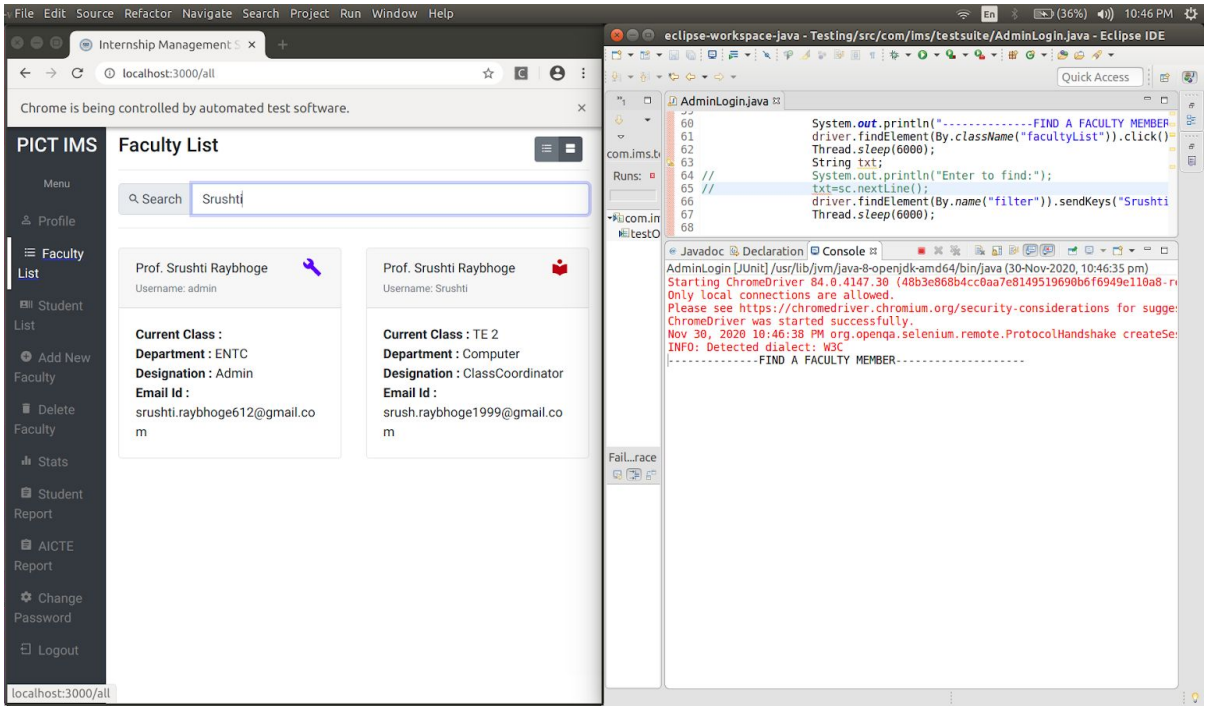
Passed test cases values are updated in the database.



FIND A FACULTY

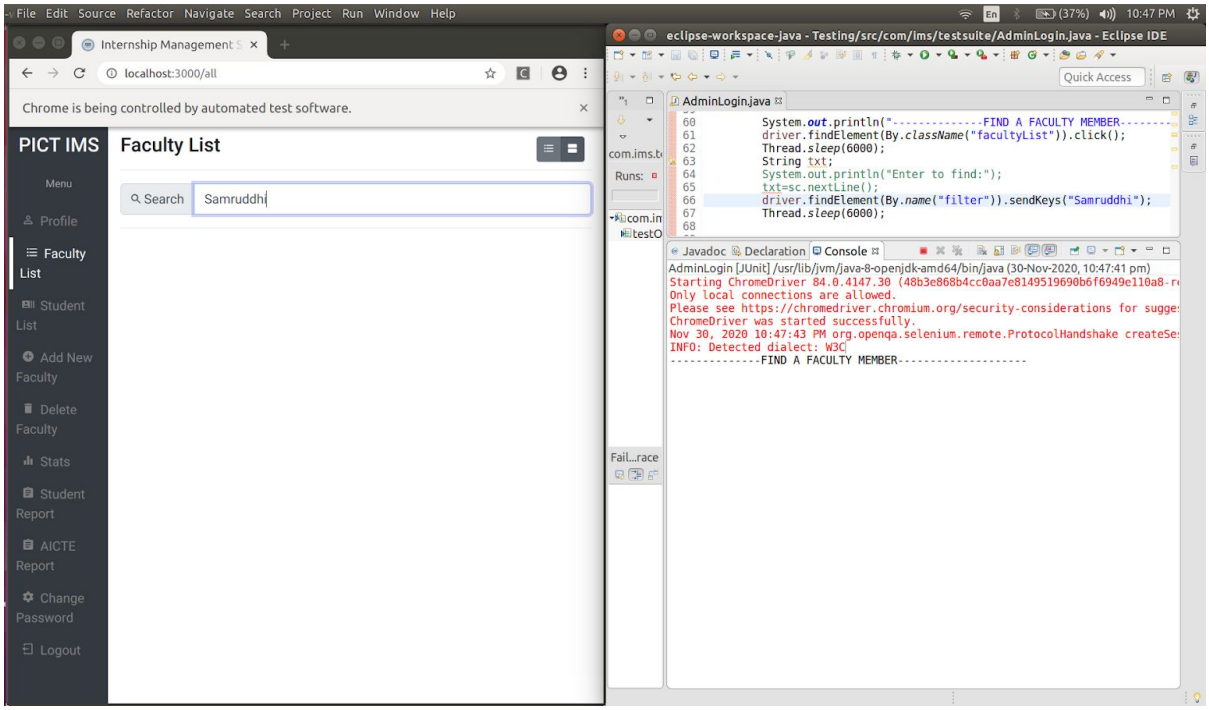
Found

Find faculty with the name srushti

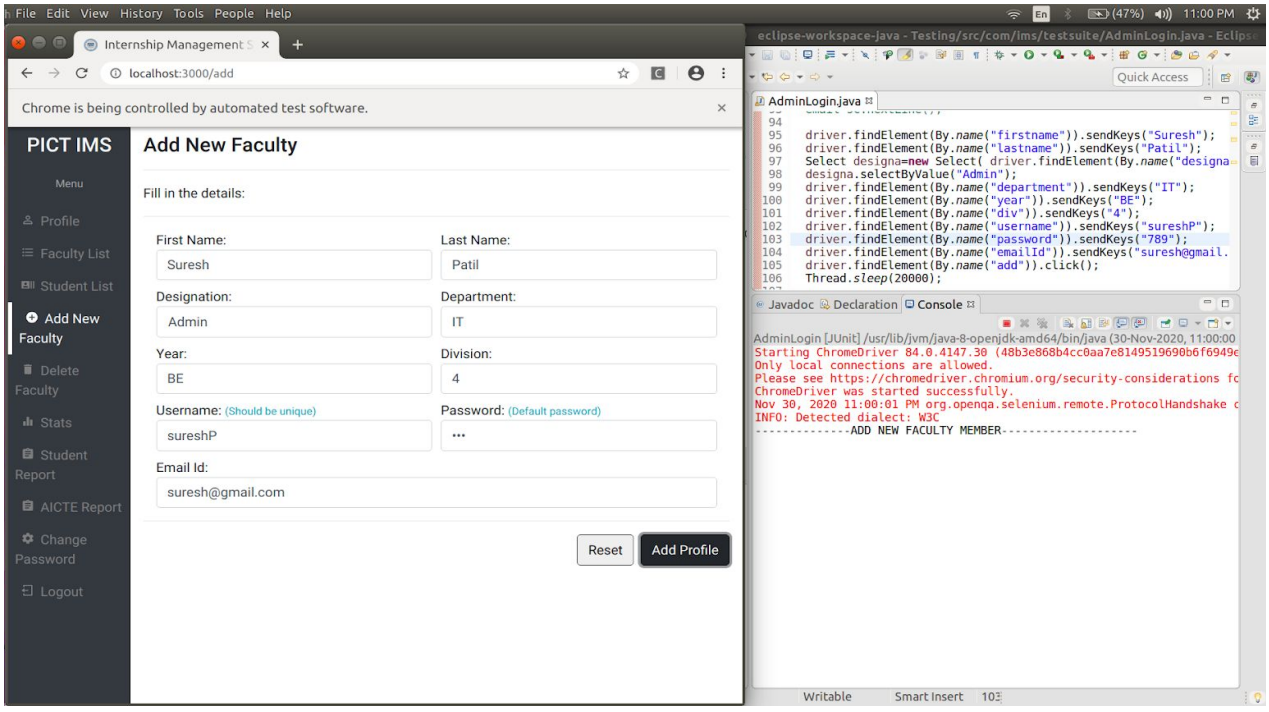


Not Found

Find faculty with the name samruddhi

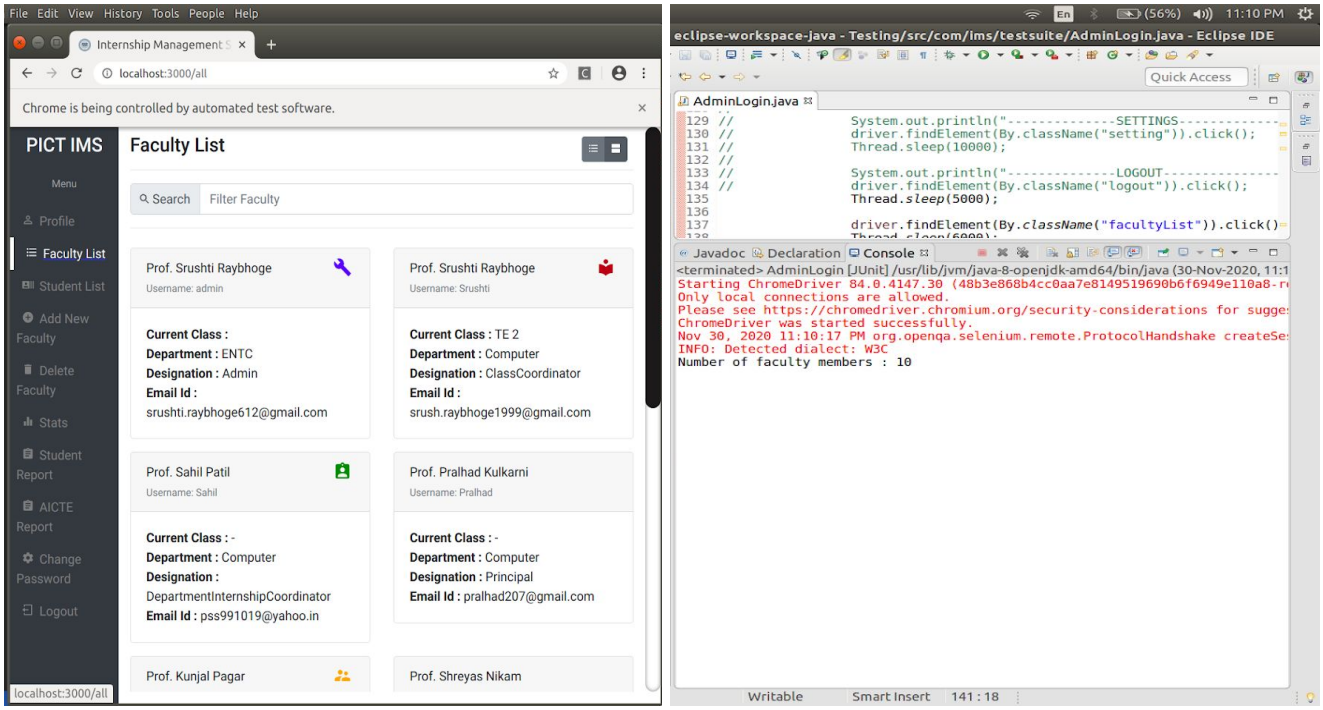


ADD NEW FACULTY MEMBER

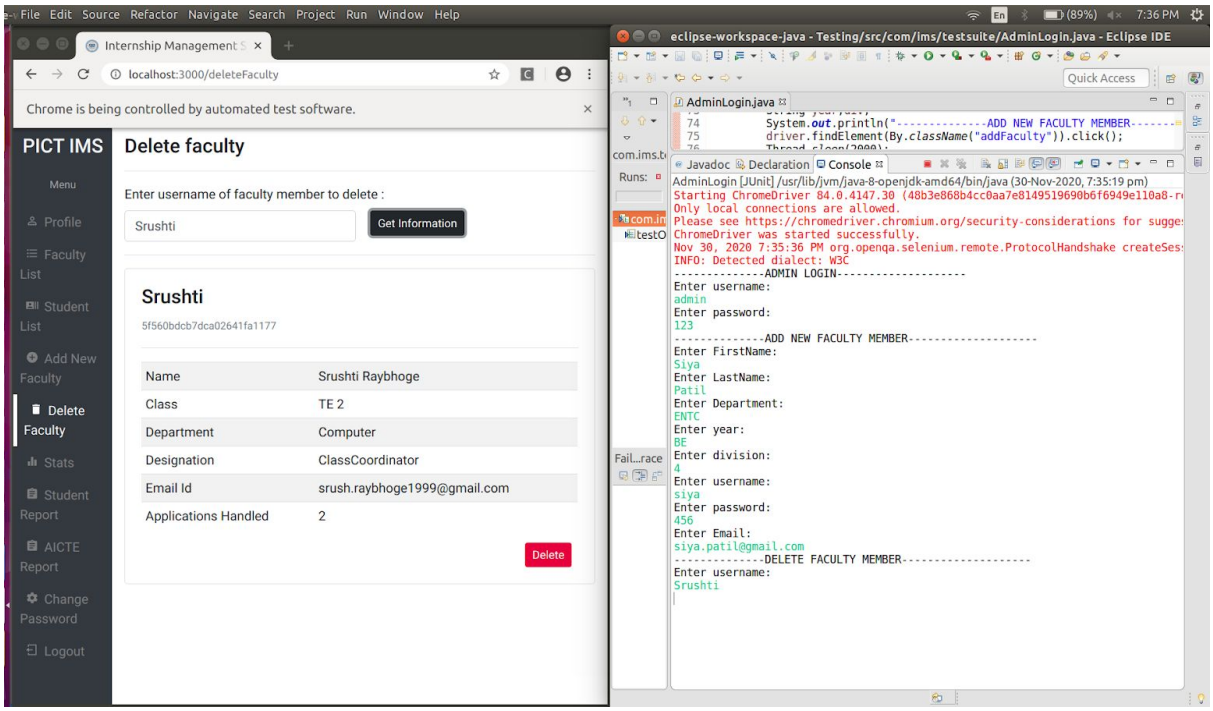


COUNT NUMBER OF FACULTY MEMBERS

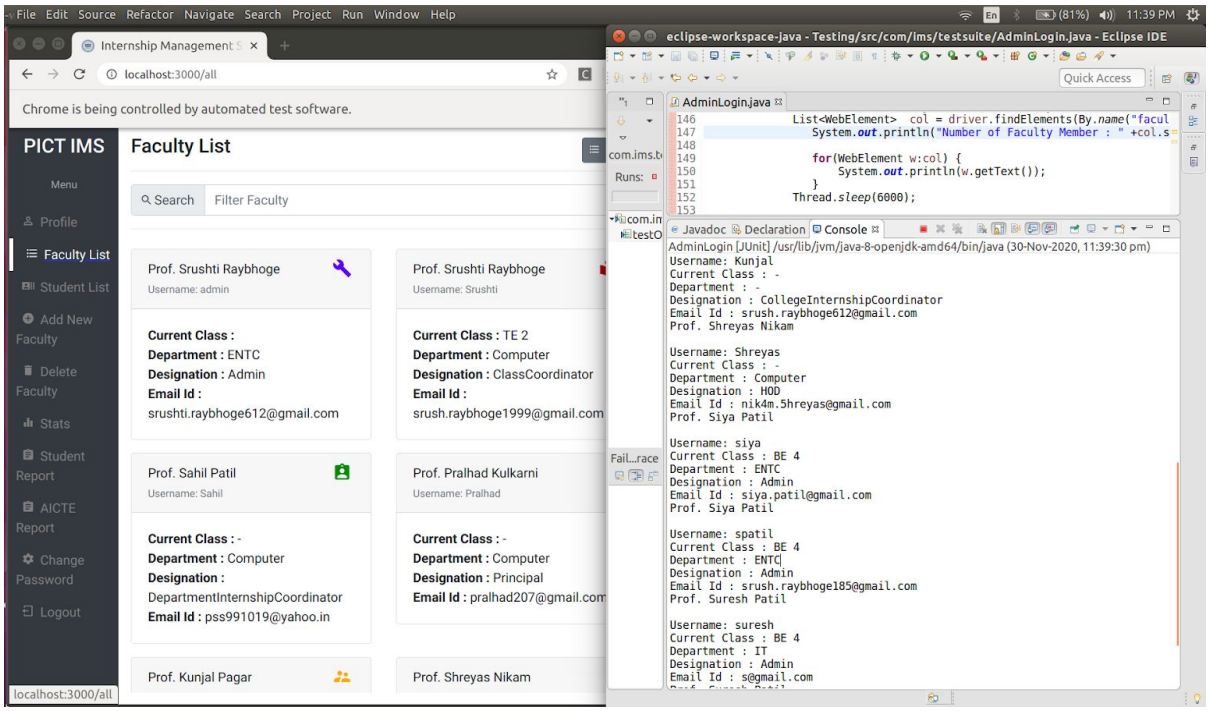
10



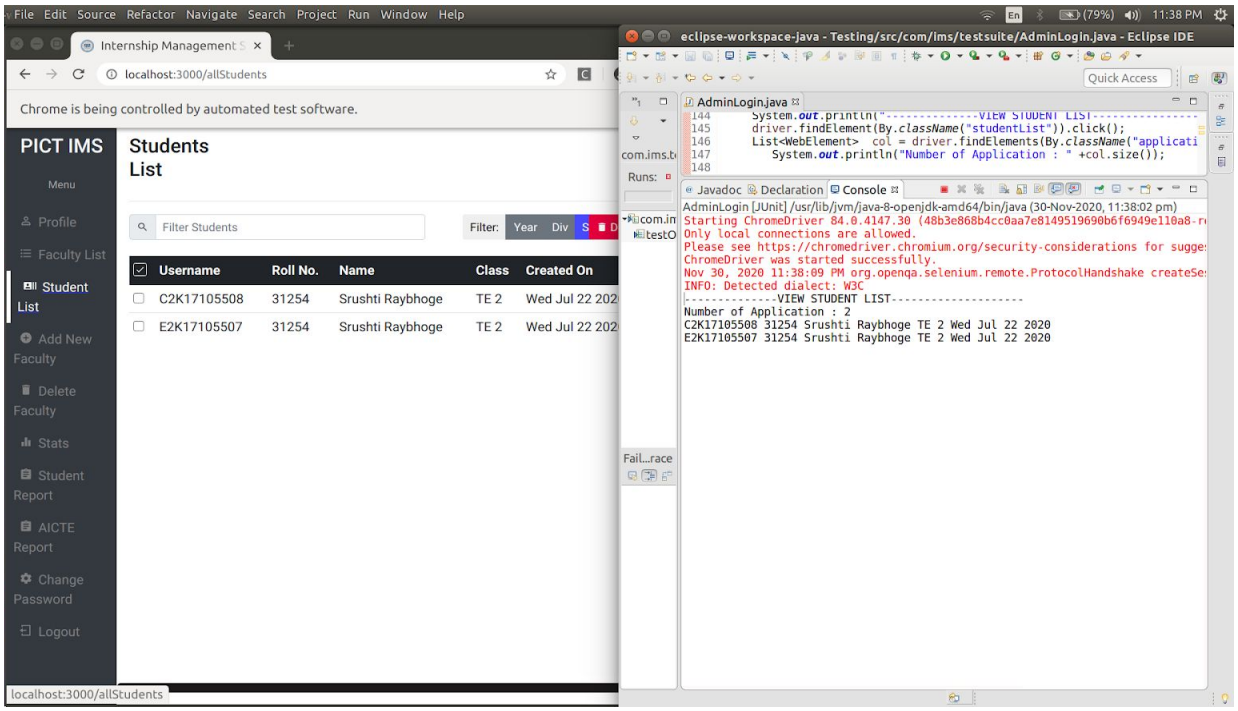
DELETE FACULTY FROM DATABASE



FACULTY LIST



APPLICATION LIST:



Conclusion:

We have automated the testing process using selenium and junit and understood automation testing. The application can be used and scaled to cloud based on the requirements.