CS 1632 – Deliverable 3: Web testing with bdd

Testing Stack Overflow (http://stackoverflow.com)

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Project Git Repository: https://github.com/phil-nye/CS1632/tree/master/Deliverable3

# **Summary**

For this project, I tested Stack Overflow (<http://stackoverflow.com>) using the BDD testing method, in order to ensure the login, search, tag, and user features were functional.

Stack Overflow contained a “Tour” link and “Advanced Search Tips” list that helped me determine which features should be tested and how they should behave. In addition, many links contained helpful tooltips when hovering over interactive objects. Specific requirements were derived by looking at the HTML source code generated by using the website during exploratory testing.

A user story was created for Login because much of the functionality of the website requires a user account. Asking questions, answering questions, responding to posts, generating reputation, and many other features require a valid user account. As such, I wanted to make sure that a user could login to a valid account to access these features, and invalid account credentials could not access user-only features (e.g. “Ask Question”).

The Search feature also had a user story to verify that advanced search methods worked as defined in the “Advanced Search Tips.” These search tools would allow users to filter out results based on criteria defined by the keywords specified in the tips.

The Tags and Users features were tested to ensure that all users could search by topics or reputable users. The tests in the Tags user story focuses primarily of the ability for the user to search and filter for tags that are interesting to them or the most popular. On the other hand, the Users user story focuses on features that allow users to find the most reputable, newest, up-and-coming users (e.g. user accounts generated in the past month with the highest vote scores), and to find moderators and editors. The Users feature is important in finding the most helpful users.

# **Difficulties**

Many issues were encountered in the process of testing Stack Overflow. Issues encountered included synchronicity problems, dynamic content problems, and issues with using Selenium.

The first problem I encountered was with “HtmlUnitDriver()” in Selenium. This web-driver seemed to be running faster than new webpages could load. I found that the “FirefoxDriver()” ran better by forcing the tests to wait for the pages to load during execution. However, this created a new problem.

Using “FirefoxDriver()” instead of “HtmlUnitDriver()” means that my tests execute slower because the Selenium WebDriver object now has to create a new browser instance and load each page to the screen. It also means that the Mozilla Firefox web browser IS REQUIRED to run the tests.

Furthermore, even with the “FirefoxDriver(),” some lines of the test code would execute too early because the element that was being found depended on further JavaScript code to fully load. I found that adding a Thread object to force the application to wait helped ameliorate these problems. However, the wait time is a constant value, and a page’s load time is dependent on the user’s network connection and the availability of their PC’s system resources. As a result, the wait times may not let the tests pass if you run the tests on a slower PC or network. In all, it takes between 4.5 and 7 minutes to run (depending on whether the sites are cached and my network speed) on my system.

A unique issue arose when testing question and answer submissions on Stack Overflow. Because of the stringent submission criteria, I could not submit questions or answers to test. All submissions require a certain length and specificity. Additionally, moderators are very quick in removing questions that have already been asked or that do not fit in with the expectations of a Stack Overflow user. Thus, I could not fully test this feature with the dummy account I created.

Finally, a problem that I have not yet encountered, but expect to encounter, is the issue of changing content. As time passes, the most popular tags/users, search results, etc. will change. I have hopefully fixed this problem by searching for HTML tags and objects that are not specific to the content. Most of the test criteria ensure that only behavior is tested, and not the content. For example, when searching for “selenium” tags, I make sure that a result contains “selenium” in it. Also, when testing for Users filters, I check that information that should be shown to the user is present (e.g. account creation date is shown when filtering newest accounts).

*All code, tests, test reports, and resources can be found on:*

<https://github.com/phil-nye/CS1632/tree/master/Deliverable3>

*The site tested is:*

[*http://stackoverflow.com*](http://stackoverflow.com)

# **User Stories and Features**

1. **Login**

As a Stack Overflow user  
I want to be able to login to my Stack Overflow account  
So that I can ask unique questions and/or submit unique answers to questions.

**Login Link**

Given that I am on the main page  
And I am not logged in yet  
And the black topbar-wrapper at the top of the homepage exists on every Stack Overflow page  
When I click on the login button on the topbar-wrapper  
Then I should be presented a new login page

**Valid Login**

Given that I have navigated to the Stack Overflow login page  
When I enter valid email and password credentials  
Then I should be presented with a new homepage that is customized to the user account

**Invalid Login**

Given that I have navigated to the Stack Overflow login page  
When I enter invalid email credentials  
Then I should be presented with a popup balloon next to the email field that indicates the email address is not tied to any existing user accounts

**Invalid Login to Ask Questions**

Given that the user is on the homepage  
And they are not logged in to a valid account  
When the "Ask Question" button is selected  
Then the user is linked to a login page so that only registered users can ask questions

**Valid Login to Ask Questions**

Given that the user is on the homepage  
And they are logged in to a valid account  
When the "Ask Question" button is selected  
Then the user is linked to a new page that explains how to ask a question

1. **Search**

As a Stack Overflow user  
I want to be able to use advanced search options with my search  
So that I can filter out entries that don't fulfill my query

**Search Bar Exists on Main Page**

Given that I am on the Stack Overflow homepage  
Then I can use the search bar in the topbar element

**Searching for a Keyword**

Given that I am on the homepage  
When I enter a keyword into the search bar in the topbar  
Then the results should contain my keyword in the submission body

**Filter Results by Score**

Given that I am on the homepage  
When I enter a keyword into the search bar in the topbar  
Then the results should show results with, at a minimum, the score I defined

**Results Only Show Questions**

Given that I am on the homepage  
When I enter a keyword to search into the search bar in the topbar  
Then I can add a type criteria so that I can search for only questions (votes and answer count shown)

**Results Only Show Answers**

Given that I am on the homepage  
When I enter a keyword to search into the search bar in the topbar  
Then I can add a type criteria so that I can search for only answers (only votes shown)

**Filter Results by Tags**

Given that I am on the homepage  
When I enter a keyword into the search bar in the topbar  
Then the results should contain my keyword in the results' tags

**Filter Results by Views Count**

Given that I am on the homepage  
When I enter a keyword into the search bar in the topbar  
Then I can add a views criteria to see the results with at least the amount of views I specify

1. **Tags**

As a Stack Overflow user  
I want to be able to browse through tags  
So that I can find topics that interest me

**Tag Search is Accessible to all Users**

Given that I am on the homepage  
When I click on the Tags button  
Then I should be presented the Tags search page

**Search Tags by Most Popular**

Given that I am on the Tags search page  
When I click on the "popular" tab  
Then the tags should show how many times the tag has been used today and this week

**Search Tags by Name**

Given that I am on the Tags search page  
When I click on the "name" tab  
Then the tags should be sorted by name in alphabetical order

**Search Tags by Recently Created**

Given that I am on the Tags search page  
When I click on the "new" tab  
Then the tags should be sorted by most recently created

**Use Tags Search Bar**

Given that I am on the Tags search page  
When I use the search bar to find tags  
Then the results should contain my query in the tag

1. **Users**

As a Stack Overflow user  
I want to be able to find users based on reputation, account creation date, voters, editors, and moderators  
So that I can decide which users are reputable or not

**Users Search is Accessible to all Users**

Given that I am on the homepage  
When I click on the Users button  
Then I should be presented the Users search page

**Filters by Scores Earned by Most Recent Users**

Given that I am on the Users search page  
When I click on the "new users" tab  
Then I should be able to see users created within the past 31 days ordered by their reputation scores

**User Search Bar to Find Specific Users**

Given that I am on the Users search page  
When I enter a username in the "find users" search box  
Then I should be presented with usernames containing that exact name

**Filter by Users with Most Edits**

Given that I am on the Users search page  
When I select the "editors" tab  
Then I should see users who have edited at least 5 posts

**Filter by Current Moderators**

Given that I am on the Users search page  
When I select the "moderators" tab  
Then I should see users who are the current forum moderators and the year they were elected



