

# CS 1632

## Deliverable 3: Web Testing with BDD

Project: Testing Hacker News with Selenium

Github Page: <https://github.com/eksheen/1632-Deliverable3>

**Y** **Hacker News** new | comments | show | ask | jobs | submit

1. ▲ **TiltBrush by Google** (tiltbrush.com)  
371 points by mukgupta 6 hours ago | 61 comments

2. ▲ **Mosul dam engineers warn it could fail at any time, killing 1M people** (theguardian.com)  
32 points by larrymcp 2 hours ago | 13 comments

3. ▲ **Curl vs. Wget** (haxx.se)  
404 points by of 12 hours ago | 156 comments

4. ▲ **Congress finally showed it's willing to fight the FBI on encryption** (theguardian.com)  
314 points by magoghm 13 hours ago | 67 comments

5. ▲ **Fitt's Law** (wikipedia.org)  
14 points by nitin\_flanker 2 hours ago | 1 comment

6. ▲ **Python Exercises for Kids** (regehr.org)  
48 points by ingve 4 hours ago | 15 comments

7. ▲ **If a Soyuz capsule lands in front of you, fo** (spaceref.com)  
156 points by marvel\_boy 8 hours ago | 36 comments

8. ▲ **Why Cranes Keep Falling** (popularmechanics.com)  
25 points by mhb 3 hours ago | 5 comments

9. ▲ **What is "the stack"?** (jvns.ca)  
99 points by jor-el 6 hours ago | 42 comments

10. ▲ **LinkedIn CEO Jeff Weiner Gives \$14M in Stock to Employees** (recode.net)  
123 points by prostoalex 10 hours ago | 65 comments


11. ▲ **Verdun: A Diabolical Inferno** (centurymagazine.co.uk)  
24 points by lermontov 3 hours ago | discuss

12. ▲ **A Unicorn Is the Last Thing This Web 2.0 Survivor Wants** (wired.com)  
39 points by gpresot 5 hours ago | 11 comments

13. ▲ **The SaaS Startup Founder's Guide** (salesforce.com)  
40 points by vyrotek 5 hours ago | 4 comments

14. ▲ **BrewDog's open-source revolution is at the vanguard of postcapitalism** (theguardian.com)  
5 points by dan1234 1 hour ago | discuss

15. ▲ **Show HN: Flexbox Defense – learn CSS flexbox by playing a tower defense game** (flexboxdefense.com)  
181 points by ChanningAllen 11 hours ago | 30 comments



Team Members:  
Neel Kowdley  
Evan Sheen

## Introduction/Testing Issues:

For this deliverable, we had to create test cases using JUnit and Selenium for a website of our choosing using Behavior Driven Development(BDD). To do this, we first had to find a website. We chose Hacker News, located at <https://news.ycombinator.com>.

Hacker News is a reddit clone that contains interesting posts(mostly programming based) and comments on those posts. Much like reddit, logged in users have the ability to upvote, post new content and make comments, while users without an account are effectively in a read only state.

There are also a number of different sections on Hacker News that differentiate it from reddit: there is a new section that shows the most recently posted articles, a show section that shares something that a user has made on hacker news, an ask section where users can ask questions to other on Hacker News and see questions that have been asked. There is also a jobs section is a place where employers can advertise jobs that have been funded by Y combinator.

We chose this site for many reasons:

1)This site has a very simple table based layout. This would make it easy to select various elements on the page.

2) Hacker News has a very limited amount of JavaScript. This means that Document Object Model(DOM) would remain relatively constant while we were testing.

3) Hacker News has a very limited set of features. This meant that getting into a bad state while testing would be relatively hard to do.

4) Hacker News is free to use and does not require an account to read submissions/comments.

5) Hacker News has a fairly static navigation header, which would make it easy to change what page we are on.

6) It has interesting articles, that would allow us to procrastinate while pretending to do work.

In order to complete this deliverable, we first started by creating user stories based on how the site functions. This started out as exploratory testing, and once we had a firm grasp on the websites features and navigation we broke down the features of Hacker News into 4 User Stories: Up-voting, Adding Content, Logging in, and Viewing

different sections on Hacker News. We then turned these into official User Stories using the Connextra format. After we had these user stories, we created scenarios based on these user stories that broke down the user stories into more manageable tasks. These User Stories and Scenarios can be seen in the User Stories/Scenario section of this deliverable below.

Once we had our User Stories and Scenarios, we were able to start writing our tests. To do this, we used the Selenium IDE plugin for Mozilla Firefox and recorded actions, which we then exported into JUnit test cases with Selenese. Once we had a firm grasp on the syntax of Selenese in Java, we were able to start writing our own code without the help of IDE.

Creating these tests were not easy. We faced many issues while trying to automate testing of Hacker News. We quickly found out that Hacker News does not use classes, tags or ids on some of its elements on the log in page. So testing some of the elements was difficult, and required looking in the <body> tag for a specific error message. We also found that some id's and tags were named according to the post number which would not be consistent as time went on.

We also ran into problems getting nested elements and iterating through the DOM. This can best be seen in our test case where we filter by new. In order to confirm that the page was in chronological order, we needed to test its age which became complicated as the times are written in strings such as "1 minute ago" and "10 hours ago". In order to test this, we had to violate the law of Demeter, and we had to make some assumptions, such that testing the first two posts was sufficient to confirm the order, and that the age would be a single number. These assumptions are quite broad and can cause problems in the future, but they worked well for our testing as posts were being made frequently, which meant that the first two posts were posted in under 10 minutes from the current time.



We also had a number of state issues, based on being logged in/out when we did not expect to be. Running our tests individually seemed to work perfectly, but when we ran the full test plan, we found a number of these errors. In order to fix this, we had to force login to logout to login, to ensure we were in the correct state to proceed with this test. We also had state issues based on time. In a few of our test cases, we had to add implicit waits, and we also found that the HTML driver does not work for all of our tests, as certain parts of the DOM do not work well with the HtmlUnitDriver.













We found that because of the nature of the website the content of the website can change rapidly and is not uniform so testing certain things such as titles can be tricky. Based on our experiences potential future problems would include making sure that we can handle significant UI changes without hard-coding certain variables in, or making broad

assumptions. We would also like to test some of our cases much more thoroughly and test more edge cases.




Our code is located at <https://github.com/eksheen/1632-Deliverable3>


# JUnit/Selenium Results


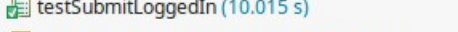
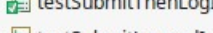
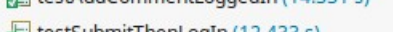
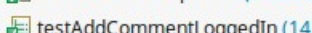
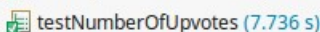

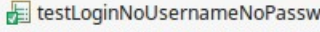
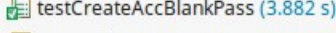
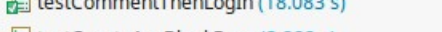
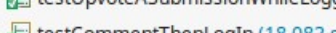
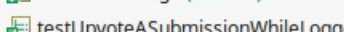


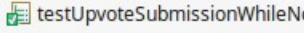
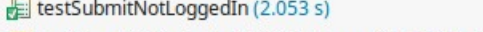
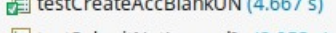
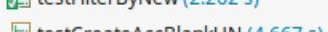
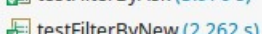
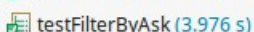
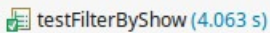
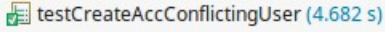
 JUnit 



Finished after 154.75 seconds

Runs: 22/22  Errors: 0  Failures: 0 

 Deliverable3.HackerNewsTester [Runner: JUnit 4] (149.812 s)



Failure Trace

# User Stories and Scenarios

## User Stories

User Story Number	User Story
1	As a registered user I want my account to be secure, so that I am the only one who can access it
2	As a user I want to be able to vote up on comments and submissions that I find interesting so that others can see how popular the comment or submission was
3	As a registered user, I want to be able to write comments and submissions so that other users can see content that I create
4	As a user of hacker news, I want to be able to view submissions by multiple categories so that I can find submissions that interest me the most

## Scenarios

User Story Number	Scenario Number	Scenario
1	1	Given no username and a password when I try to create a new account, then I should receive an error.
1	2	Given no password and a username when I try to create a new account, then I should receive an error.
1	3	Given an account with no username and no password, when I try to login, then I should receive an error.
1	4	Given an account with a bad username and password combo when I try to login, then I should receive an error.
1	5	Given a username of a preexisting account and some password combo when I try to create an account, then I should receive an error.
2	6	Given a comment and a valid logged in account when you upvote a comment, then the upvote should successfully occur.
2	7	Given a submission and a valid logged in account when you upvote a submission, then the upvote should successfully occur.
2	8	Given a comment and a no currently logged in account when you upvote a comment, then an error should occur
2	9	Given a comment and a no currently logged in account when you upvote a submission, then an error should occur
2	10	Given a submission, when you view a list of submissions, then you should be able to see the number of upvotes
3	11	Given that a user is not logged in when they try to make a

		comment, then an error message should appear
3	12	Given that a user is not logged in when they try to submit a post, then an error message should appear
3	13	Given a user is logged in when they submit a post, then they should be able to post
3	14	Given a user is logged in when they post a comment, then they should be able to comment.
3	15	Given a user tries to submit a post, when they are not logged in, then they should be able to log in and finish their submission.
4	16	Given a list of all submissions when new is clicked, then the first two submissions should be ordered by timestamps
4	17	Given a list of all submissions when show is clicked, then all of the posts should have Show HN in the title
4	18	Given a list of all submissions when asked is clicked, then at least 28 posts should have Tell, Office Hours, '?' or Ask HN:
4	19	Given a some random word when search is pressed, then the search results page should return some results
4	20	Given the default homepage, when a user visits the site, then every post should have a score