Deliverable 4

Team 29: GoodbyeWorld!
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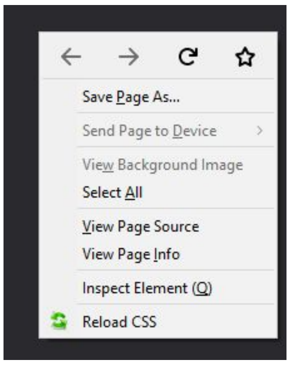
Feature 1: bug link
Name: Track Changes - warn the user when a stylesheet is replaced with a popup
Implement the feature (check github): link to github repo

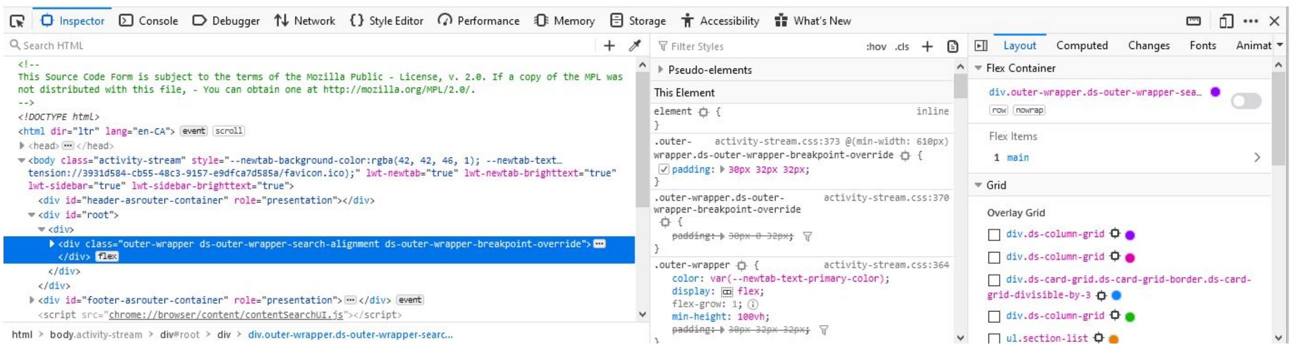
User Guide:
Overview: In the Style Editor found within Mozilla DevTools, stylesheets are shown to the user that allow them to modify the current page however they want based on the stylesheet/css that is shown in the Style Editor. The Style Editor allows for changes, as well as a "save" feature where the user can export the stylesheet so that it may be used in the future again. Sometimes, the existing stylesheet may be overridden by a "newer" one. For example, the page may have a hot reload and the stylesheet the user was working on could be outdated since there is now a more recent one. In this case, there is no problem, except that the user may have wanted to save their changes before losing them by refreshing. Of course, this is not good behaviour, as the user has now completely lost any changes they have done since the file has been overwritten. In order to fix this, it isn't possible to disable stylesheets from being overwritten, since some pages need that feature. Instead, it would be better to prompt the user if they want to save the affected stylesheets and if they do, they must do it now. Otherwise, the sheet will be overwritten and all changes from the user are lost.

Inspector and Style Editor

Upon right-click on the page in Mozilla, the following menu comes up. Click Inspect Element or Q on the keyboard to access the DevTools



Then, the following Inspector comes up. Here, the user can change inline HTML and CSS.

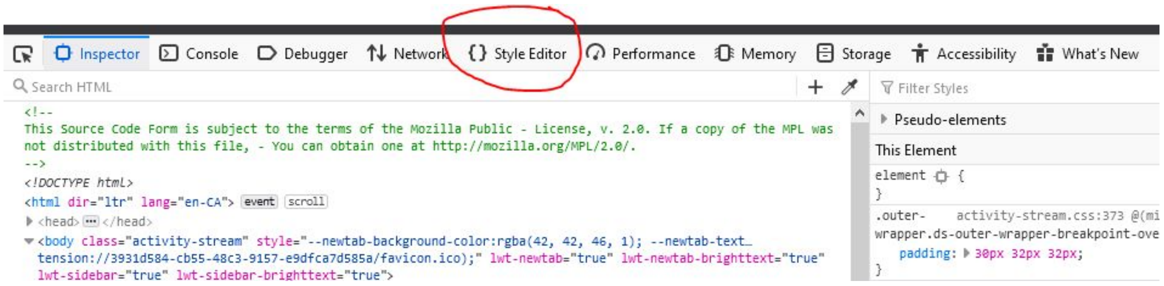


```
<!--
This Source Code Form is subject to the terms of the Mozilla Public - License, v. 2.0. If a copy of the MPL was
not distributed with this file, - You can obtain one at http://mozilla.org/MPL/2.0/.
-->
<!DOCTYPE html>
<html dir="ltr" lang="en-CA"> event scroll
 <head> ··· </head>
 <body class="activity-stream" style="--newtab-background-color:rgba(42, 42, 46, 1); --newtab-text…
  tension://3931d584-cb55-48c3-9157-e9dfca7d585a/favicon.ico);" lwt-newtab="true" lwt-newtab-brighttext="true"
  lwt-sidebar="true" lwt-sidebar-brighttext="true">
   <div id="header-asrouter-container" role="presentation"></div>
   <div id="root">
    <div>
     <div class="outer-wrapper ds-outer-wrapper-search-alignment ds-outer-wrapper-breakpoint-override"> ···
     </div> flex
    </div>
   </div>
   <div id="footer-asrouter-container" role="presentation"> ··· </div> event
   <script src="chrome://browser/content/contentSearchUI.js"></script>
html > body.activity-stream > div#root > div > div.outer-wrapper.ds-outer-wrapper-searc...
```

```
element {                                   inline
}
.outer-    activity-stream.css:373 @(min-width: 610px)
wrapper.ds-outer-wrapper-breakpoint-override {
  padding: 30px 32px 32px;
}
.outer-wrapper.ds-outer-              activity-stream.css:370
wrapper-breakpoint-override
 {
  ~~padding: 30px 0 32px;~~
}
.outer-wrapper {                      activity-stream.css:364
  color: var(--newtab-text-primary-color);
  display: flex;
  flex-grow: 1;
  min-height: 100vh;
  ~~padding: 30px 32px 32px;~~
```

```
div.outer-wrapper.ds-outer-wrapper-sea…
row nowrap
1 main
div.ds-column-grid
div.ds-column-grid
div.ds-card-grid.ds-card-grid-border.ds-card-grid-divisible-by-3
div.ds-column-grid
ul.section-list
```

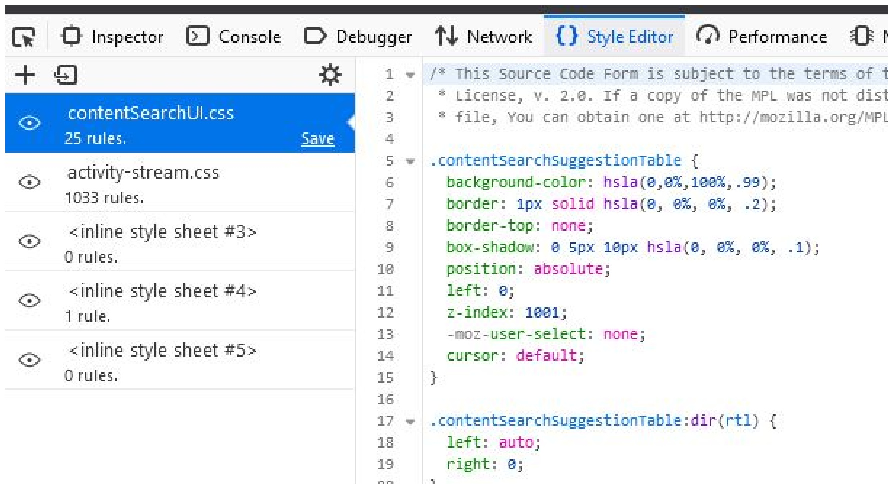
The user can also change CSS through the Style Editor, seen below.



```
<!--
This Source Code Form is subject to the terms of the Mozilla Public - License, v. 2.0. If a copy of the MPL was
not distributed with this file, - You can obtain one at http://mozilla.org/MPL/2.0/.
-->
<!DOCTYPE html>
<html dir="ltr" lang="en-CA"> event scroll
▸ <head> ••• </head>
▾ <body class="activity-stream" style="--newtab-background-color:rgba(42, 42, 46, 1); --newtab-text…
  tension://3931d584-cb55-48c3-9157-e9dfca7d585a/favicon.ico);" lwt-newtab="true" lwt-newtab-brighttext="true"
  lwt-sidebar="true" lwt-sidebar-brighttext="true">
```

```
element { 
}
.outer-     activity-stream.css:373 @(mi
wrapper.ds-outer-wrapper-breakpoint-ove
    padding: ▸ 30px 32px 32px;
}
```

Within the Style Editor, the current CSS files of the website are shown. Users can save the sheet (export it) and also edit them. Any changes in these files will be shown live just like the Inspector.

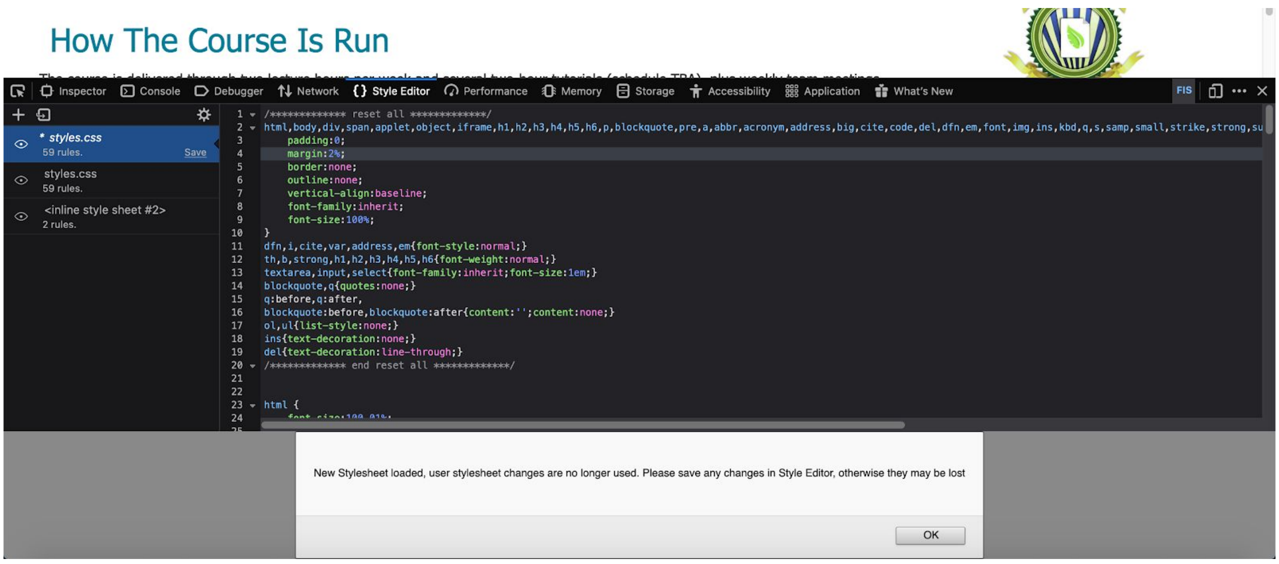


```
/* This Source Code Form is subject to the terms of t
 * License, v. 2.0. If a copy of the MPL was not dist
 * file, You can obtain one at http://mozilla.org/MPL

.contentSearchSuggestionTable {
  background-color: hsla(0,0%,100%,.99);
  border: 1px solid hsla(0, 0%, 0%, .2);
  border-top: none;
  box-shadow: 0 5px 10px hsla(0, 0%, 0%, .1);
  position: absolute;
  left: 0;
  z-index: 1001;
  -moz-user-select: none;
  cursor: default;
}

.contentSearchSuggestionTable:dir(rtl) {
  left: auto;
  right: 0;
```

Now, if the user were to make any changes inside the Inspector or Style Editor and the website reloads a new CSS file that overwrites the changes, our new feature will prompt the user. The prompt will alert the user and let them know that their changes may no longer be valid and that they should save any sheets they want within the Style Editor as they may be lost if they do not.



```
/************** reset all **************/
html,body,div,span,applet,object,iframe,h1,h2,h3,h4,h5,h6,p,blockquote,pre,a,abbr,acronym,address,big,cite,code,del,dfn,em,font,img,ins,kbd,q,s,samp,small,strike,strong,su
    padding:0;
    margin:2%;
    border:none;
    outline:none;
    vertical-align:baseline;
    font-family:inherit;
    font-size:100%;
}
dfn,i,cite,var,address,em{font-style:normal;}
th,b,strong,h1,h2,h3,h4,h5,h6{font-weight:normal;}
textarea,input,select{font-family:inherit;font-size:1em;}
blockquote,q{quotes:none;}
q:before,q:after,
blockquote:before,blockquote:after{content:'';content:none;}
ol,ul{list-style:none;}
ins{text-decoration:none;}
del{text-decoration:line-through;}
/************** end reset all **************/


html {
```

New Stylesheet loaded, user stylesheet changes are no longer used. Please save any changes in Style Editor, otherwise they may be lost

Document design of code/UML Diagrams

<u>Server side</u>

- Changes actor (devtools/server/actors/changes.js)
- Browser-Context Actor(devtools/server/actors/targets/browsing-context.js)
- StylesheetActor (devtools/server/actors/stylesheets.js)
- Changes specs (devtools/shared/specs/changes.js)

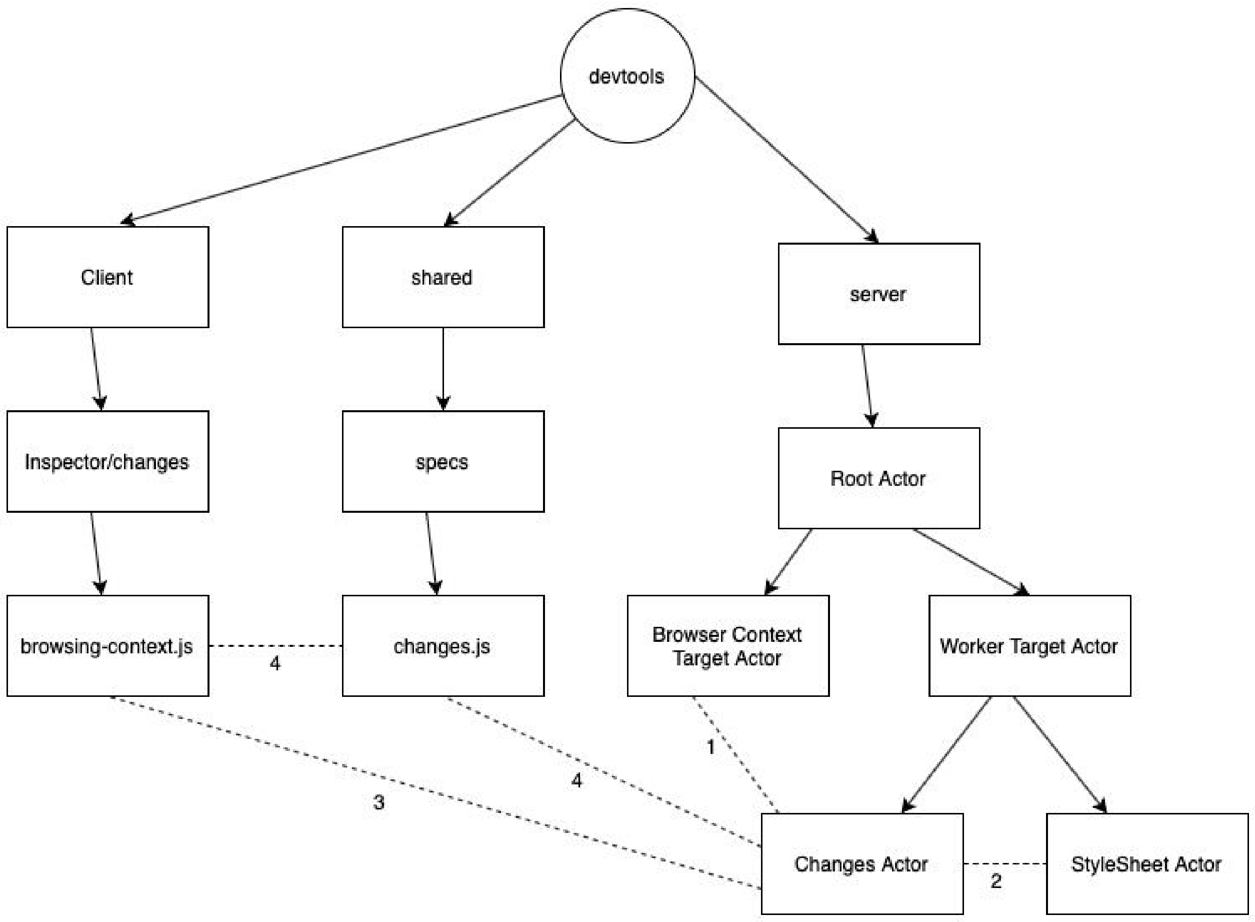
<u>Client side</u>

- Changeview.js (devtools/client/inspector/changes/ChangesView.js)

The code can be sectioned into two parts, the server side and the client side. On the server side. The biggest part of our code went into the changes actor in the file listed above. In that actor, we added a new listener and event-handler which waited for the “stylesheet-added” listener from the browser-context file. Once that event is triggered, we cross-reference the list of css hrefs from changes.js to the latest css href from the stylesheet actor. We also added a change to the changes specs file under shared where we added the new event listener we implemented as one of the listeners to be triggered and activated with the asynchronous front end event handlers. This was the difference between our plan in deliverable 3 to now. We never initially had a plan to alter this file, but upon further inspection, we discovered that this was needed to complete the feature. Lastly for the front-end, we implemented a listener and event handler for the event we threw from our implementation in the changes actor. The listener waits for the “changed-sheet” event and then alerts the user that their style changes have reverted back to a previous version unexpectedly.

The following explains the connections between files (labeled on diagrams with numbers)

(1) This is the listener between the observer (changes actor) and the observable (Browser Context Target Actor). Observer listens for the stylesheet added event
(2) This is the cross reference between this.changes href from changes actor to the current href in stylesheet actor
(3) This is the listener between the observer (browsing-context.js) and the observable (Changes Actor). Observer listens for the stylesheet changed event thrown by changes actor and create warning
(4) The front end and the back end are asynchronous so when the event is triggered in the changes actor, the front end needs to handle it, and changes.js contains the event as part of the events the respective front-end should look for


devtools
Client
shared
server
Inspector/changes
specs
Root Actor
browsing-context.js
changes.js
Browser Context Target Actor
Worker Target Actor
4
1
4
3
Changes Actor
2
StyleSheet Actor

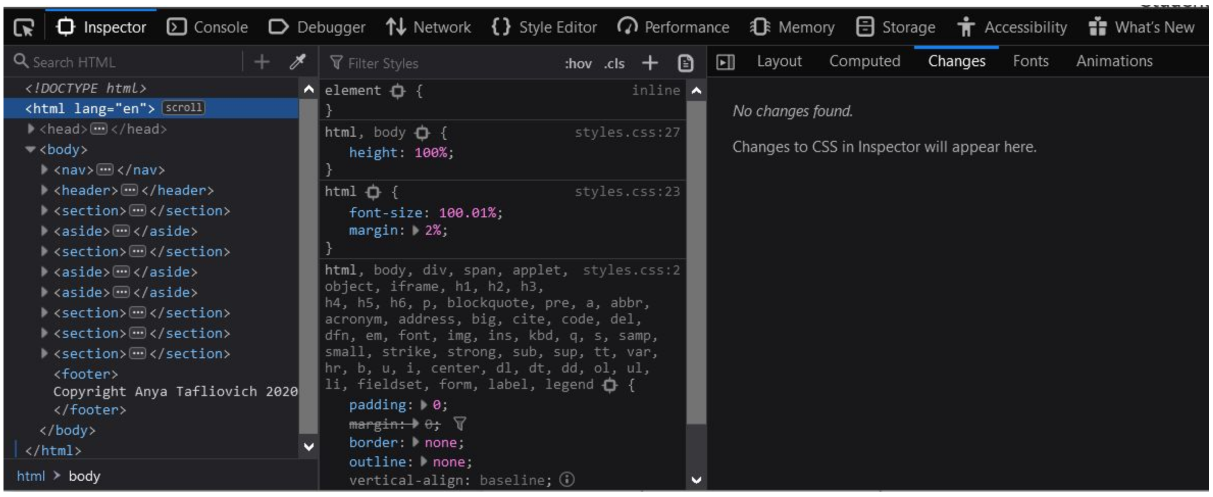
Acceptance Tests

Setup

- git clone https://github.com/thasitathan/gecko-dev.git
- git checkout feature-1500979
- Install CSS Reloader extension in the browser
    a. Css reloader

1. Adding CSS through Inspector

- Navigate to a website which uses css files not just embedded styling
    a. website
- Go to developer tools, press F12 or right click on page and click Inspect Elements
- In the inspector you must click on the changes tap in the right window



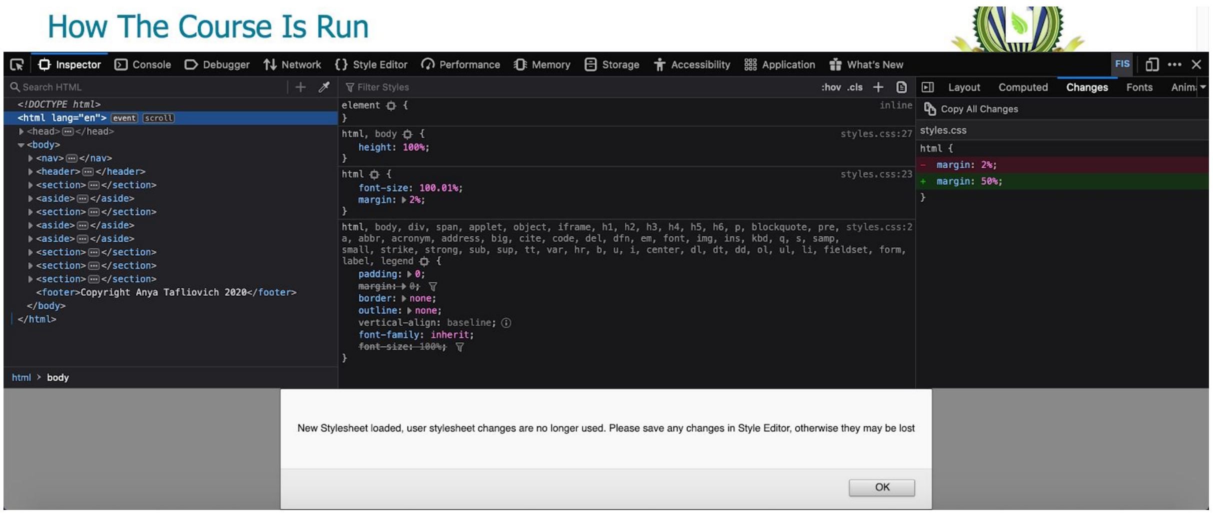
```
<!DOCTYPE html>
<html lang="en"> scroll
  <head>⋯</head>
  <body>
    <nav>⋯</nav>
    <header>⋯</header>
    <section>⋯</section>
    <aside>⋯</aside>
    <section>⋯</section>
    <aside>⋯</aside>
    <aside>⋯</aside>
    <section>⋯</section>
    <section>⋯</section>
    <section>⋯</section>
    <footer>
    Copyright Anya Tafliovich 2020
    </footer>
  </body>
</html>
```

```
element {                                   inline
}
html, body {                                styles.css:27
  height: 100%;
}
html {                                      styles.css:23
  font-size: 100.01%;
  margin: 2%;
}
html, body, div, span, applet,              styles.css:2
object, iframe, h1, h2, h3,
h4, h5, h6, p, blockquote, pre, a, abbr,
acronym, address, big, cite, code, del,
dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var,
hr, b, u, i, center, dl, dt, dd, ol, ul,
li, fieldset, form, label, legend {
  padding: 0;
  ~~margin: 0;~~
  border: none;
  outline: none;
  vertical-align: baseline;
```

No changes found.

Changes to CSS in Inspector will appear here.

- Click on an html element in the inspector and add a new style
    a. Ex. add margin: 50%;
- Now right click page and click Reload CSS (your change would have been reverted)
- There should be a pop up at the bottom of the page prompting that a new stylesheet is being used and your changes are no longer picked up



```
<!DOCTYPE html>
<html lang="en"> event scroll
  <head>⋯</head>
  <body>
    <nav>⋯</nav>
    <header>⋯</header>
    <section>⋯</section>
    <aside>⋯</aside>
    <section>⋯</section>
    <aside>⋯</aside>
    <aside>⋯</aside>
    <section>⋯</section>
    <section>⋯</section>
    <section>⋯</section>
    <footer>Copyright Anya Tafliovich 2020</footer>
  </body>
</html>
```

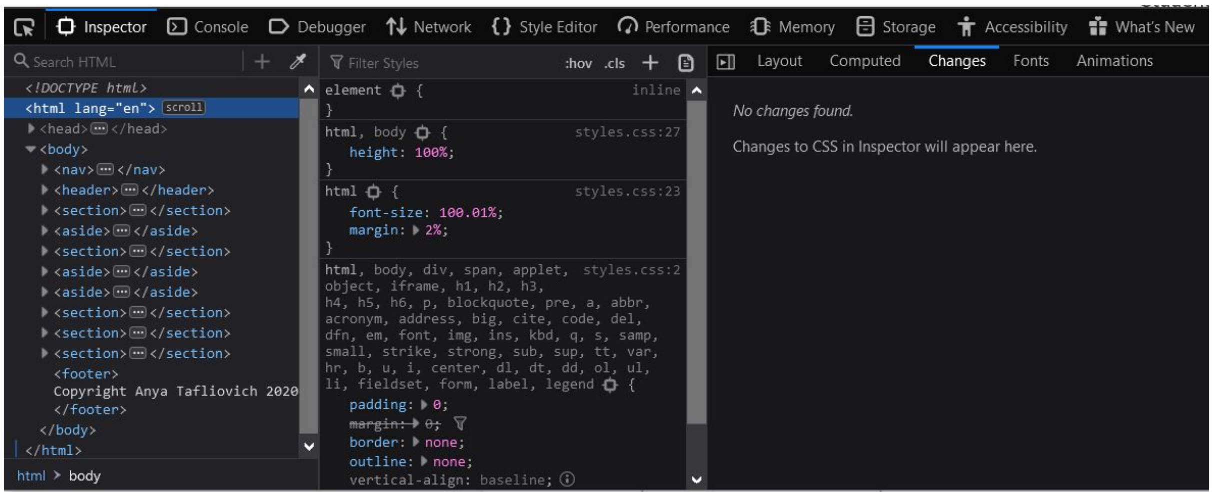
```
element {                                   inline
}
html, body {                                styles.css:27
  height: 100%;
}
html {                                      styles.css:23
  font-size: 100.01%;
  margin: 2%;
}
html, body, div, span, applet, object, iframe, h1, h2, h3, h4, h5, h6, p, blockquote, pre, styles.css:2
a, abbr, acronym, address, big, cite, code, del, dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var, hr, b, u, i, center, dl, dt, dd, ol, ul, li, fieldset, form,
label, legend {
  padding: 0;
  ~~margin: 0;~~
  border: none;
  outline: none;
  vertical-align: baseline;
  font-family: inherit;
  ~~font-size: 100%;~~
}
```

```
styles.css
html {
-  margin: 2%;
+  margin: 50%;
}
```

New Stylesheet loaded, user stylesheet changes are no longer used. Please save any changes in Style Editor, otherwise they may be lost

2. Remove a css change through inspector and css reload

- Navigate to a website which uses css files not just embedded styling
    a. website
- Go to developer tools, press F12 or right click on page and click Inspect Elements
- In the inspector you must click on the changes tap in the right window



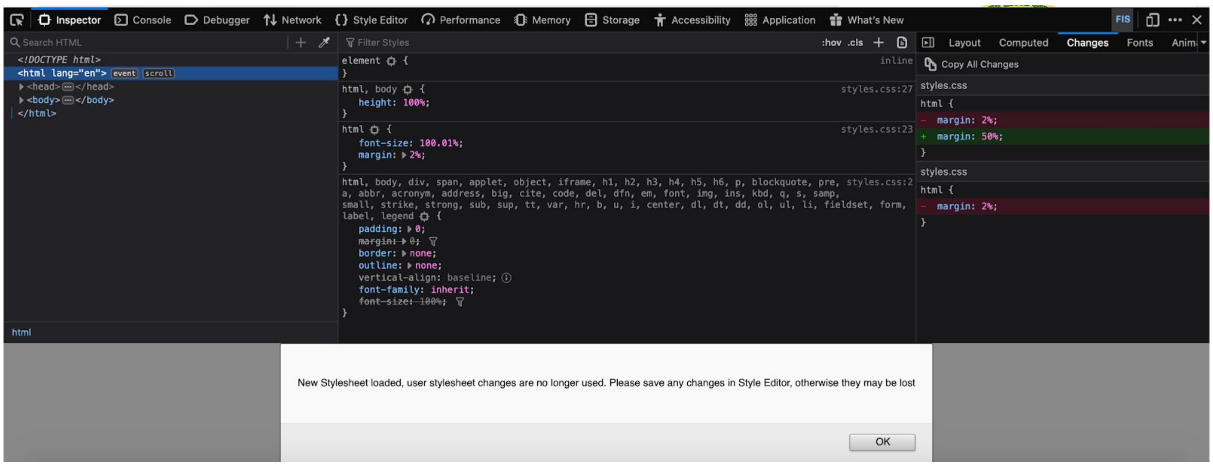
```
<!DOCTYPE html>
<html lang="en"> scroll
  <head>…</head>
  <body>
    <nav>…</nav>
    <header>…</header>
    <section>…</section>
    <aside>…</aside>
    <section>…</section>
    <aside>…</aside>
    <aside>…</aside>
    <section>…</section>
    <section>…</section>
    <section>…</section>
    <footer>
    Copyright Anya Tafliovich 2020
    </footer>
  </body>
</html>
```

```
element {                                   inline
}
html, body {                                styles.css:27
   height: 100%;
}
html {                                      styles.css:23
   font-size: 100.01%;
   margin: 2%;
}
html, body, div, span, applet,  styles.css:2
object, iframe, h1, h2, h3,
h4, h5, h6, p, blockquote, pre, a, abbr,
acronym, address, big, cite, code, del,
dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var,
hr, b, u, i, center, dl, dt, dd, ol, ul,
li, fieldset, form, label, legend {
   padding: 0;
   ~~margin: 0;~~
   border: none;
   outline: none;
   vertical-align: baseline;
```

No changes found.

Changes to CSS in Inspector will appear here.

- Click on an html element in the inspector and remove an existing css style
    a. Ex. remove margin for an html element
- Now right click page and click Reload CSS
- There should be a pop up at the bottom of the page prompting that a new stylesheet is being used and your changes are no longer picked up



```
<!DOCTYPE html>
<html lang="en"> event scroll
  <head>…</head>
  <body>…</body>
</html>
```

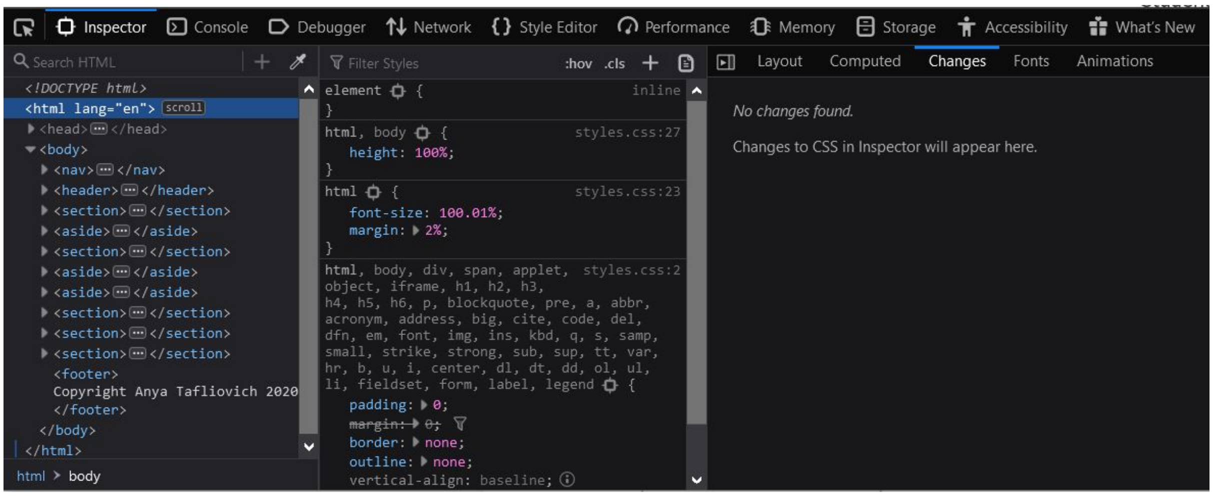
```
element {                                                              inline
}
html, body {                                                           styles.css:27
   height: 100%;
}
html {                                                                 styles.css:23
   font-size: 100.01%;
   margin: 2%;
}
html, body, div, span, applet, object, iframe, h1, h2, h3, h4, h5, h6, p, blockquote, pre, styles.css:2
a, abbr, acronym, address, big, cite, code, del, dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var, hr, b, u, i, center, dl, dt, dd, ol, ul, li, fieldset, form,
label, legend {
   padding: 0;
   ~~margin: 0;~~
   border: none;
   outline: none;
   vertical-align: baseline;
   font-family: inherit;
   ~~font-size: 100%;~~
}
```

```
styles.css
html {
-  margin: 2%;
+  margin: 50%;
}
styles.css
html {
-  margin: 2%;
}
```

New Stylesheet loaded, user stylesheet changes are no longer used. Please save any changes in Style Editor, otherwise they may be lost

3. Add a css change through style editor and css reload

- Navigate to a website which uses css files not just embedded styling
    a. website
- Go to developer tools, press F12 or right click on page and click Inspect Elements
- In the inspector you must click on the changes tap in the right window (Must Do!)



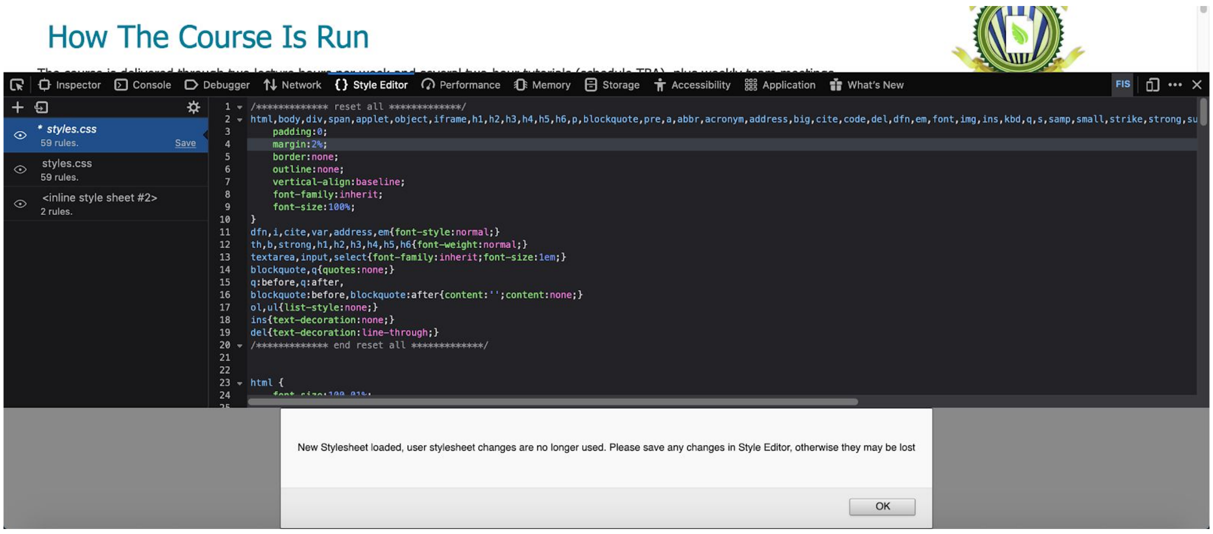
```
<!DOCTYPE html>
<html lang="en"> scroll
  <head>…</head>
  <body>
    <nav>…</nav>
    <header>…</header>
    <section>…</section>
    <aside>…</aside>
    <section>…</section>
    <aside>…</aside>
    <aside>…</aside>
    <section>…</section>
    <section>…</section>
    <section>…</section>
    <footer>
    Copyright Anya Tafliovich 2020
    </footer>
  </body>
</html>
```

```
element {                                   inline
}
html, body {                          styles.css:27
  height: 100%;
}
html {                                styles.css:23
  font-size: 100.01%;
  margin: 2%;
}
html, body, div, span, applet,  styles.css:2
object, iframe, h1, h2, h3,
h4, h5, h6, p, blockquote, pre, a, abbr,
acronym, address, big, cite, code, del,
dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var,
hr, b, u, i, center, dl, dt, dd, ol, ul,
li, fieldset, form, label, legend {
  padding: 0;
  ~~margin: 0;~~
  border: none;
  outline: none;
  vertical-align: baseline;
```

No changes found.

Changes to CSS in Inspector will appear here.

- Navigate to the style editor tab
- Click style sheet.css and add a new style
    a. Ex. add margin: 2%
- Now right click page and click Reload CSS
- There should be a pop up at the bottom of the page prompting that a new stylesheet is being used and your changes are no longer picked up
    a. There should be a new style.css file in the style editor
    b. The original file you edited should still be there but has an asterix infront of the name



* styles.css
59 rules.

styles.css
59 rules.

<inline style sheet #2>
2 rules.

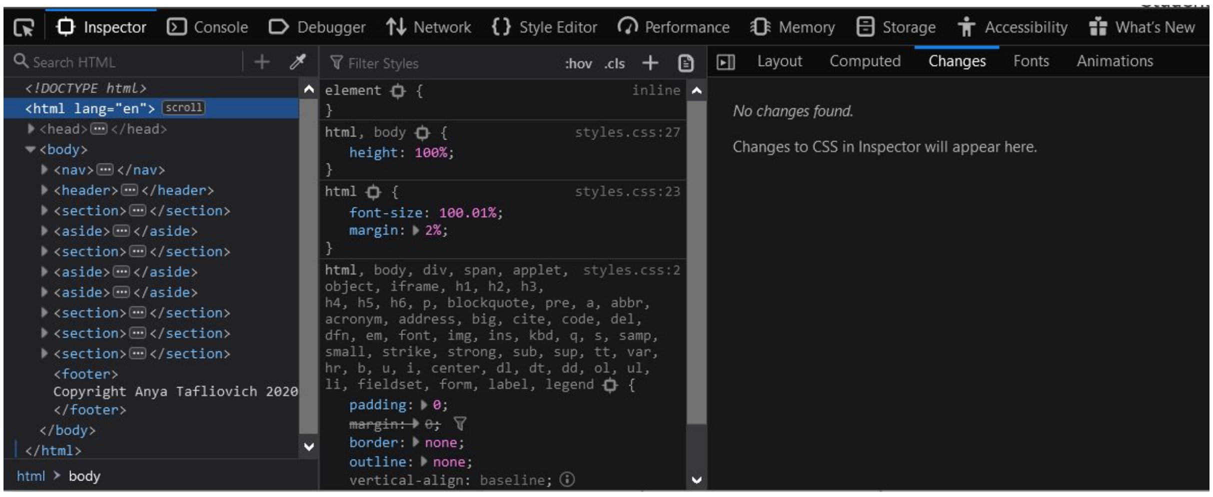
```
/************* reset all *************/
html,body,div,span,applet,object,iframe,h1,h2,h3,h4,h5,h6,p,blockquote,pre,a,abbr,acronym,address,big,cite,code,del,dfn,em,font,img,ins,kbd,q,s,samp,small,strike,strong,su
    padding:0;
    margin:2%;
    border:none;
    outline:none;
    vertical-align:baseline;
    font-family:inherit;
    font-size:100%;
}
dfn,i,cite,var,address,em{font-style:normal;}
th,b,strong,h1,h2,h3,h4,h5,h6{font-weight:normal;}
textarea,input,select{font-family:inherit;font-size:1em;}
blockquote,q{quotes:none;}
q:before,q:after,
blockquote:before,blockquote:after{content:'';content:none;}
ol,ul{list-style:none;}
ins{text-decoration:none;}
del{text-decoration:line-through;}
/************* end reset all *************/


html {
```

New Stylesheet loaded, user stylesheet changes are no longer used. Please save any changes in Style Editor, otherwise they may be lost

4. Remove a css change through style editor and css reload

- Navigate to a website which uses css files not just embedded styling
    a. website
- Go to developer tools, press F12 or right click on page and click Inspect Elements
- In the inspector you must click on the changes tap in the right window (Must Do!)



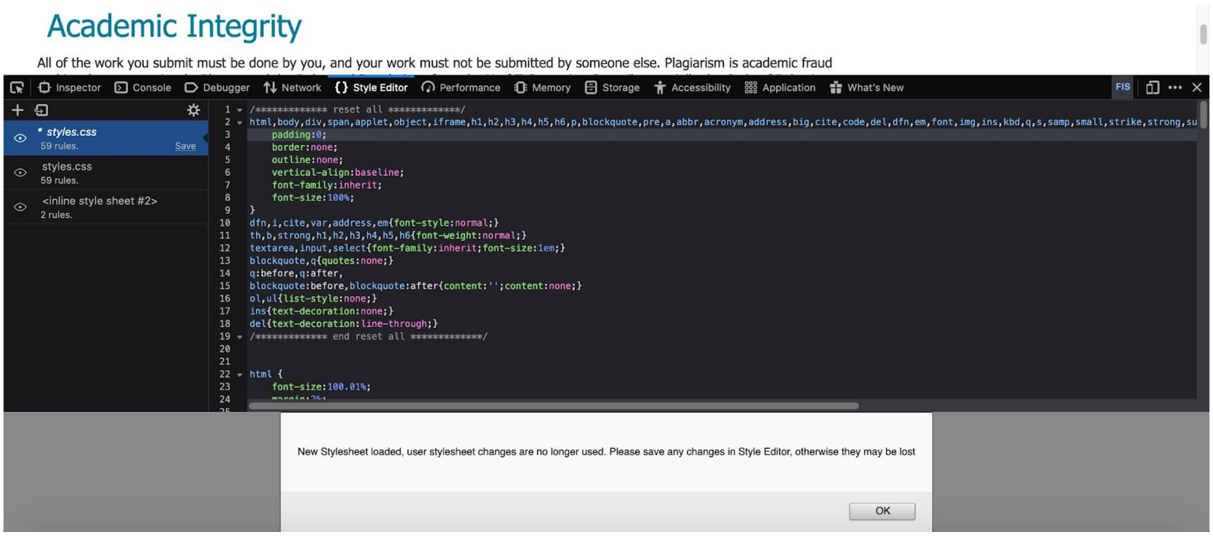
```
<!DOCTYPE html>
<html lang="en"> scroll
  <head>…</head>
  <body>
    <nav>…</nav>
    <header>…</header>
    <section>…</section>
    <aside>…</aside>
    <section>…</section>
    <aside>…</aside>
    <aside>…</aside>
    <section>…</section>
    <section>…</section>
    <section>…</section>
    <footer>
    Copyright Anya Tafliovich 2020
    </footer>
  </body>
</html>
```

```
element {                                        inline
}
html, body {                                 styles.css:27
    height: 100%;
}
html {                                       styles.css:23
    font-size: 100.01%;
    margin: 2%;
}
html, body, div, span, applet,                styles.css:2
object, iframe, h1, h2, h3,
h4, h5, h6, p, blockquote, pre, a, abbr,
acronym, address, big, cite, code, del,
dfn, em, font, img, ins, kbd, q, s, samp,
small, strike, strong, sub, sup, tt, var,
hr, b, u, i, center, dl, dt, dd, ol, ul,
li, fieldset, form, label, legend {
    padding: 0;
    ~~margin: 0;~~
    border: none;
    outline: none;
    vertical-align: baseline;
```

No changes found.

Changes to CSS in Inspector will appear here.

- Navigate to the style editor tab
- Click style sheet.css and remove an existing file
- Now right click page and click Reload CSS
- There should be a pop up at the bottom of the page prompting that a new stylesheet is being used and your changes are no longer picked up
    a. There should be a new style.css file in the style editor
    b. The original file you edited should still be there but has an asterix in front of the name



Academic Integrity

All of the work you submit must be done by you, and your work must not be submitted by someone else. Plagiarism is academic fraud

* styles.css
59 rules. Save

styles.css
59 rules.

<inline style sheet #2>
2 rules.

```
/************* reset all *************/
html,body,div,span,applet,object,iframe,h1,h2,h3,h4,h5,h6,p,blockquote,pre,a,abbr,acronym,address,big,cite,code,del,dfn,em,font,img,ins,kbd,q,s,samp,small,strike,strong,su
    padding:0;
    border:none;
    outline:none;
    vertical-align:baseline;
    font-family:inherit;
    font-size:100%;
}
dfn,i,cite,var,address,em{font-style:normal;}
th,b,strong,h1,h2,h3,h4,h5,h6{font-weight:normal;}
textarea,input,select{font-family:inherit;font-size:1em;}
blockquote,q{quotes:none;}
q:before,q:after,
blockquote:before,blockquote:after{content:'';content:none;}
ol,ul{list-style:none;}
ins{text-decoration:none;}
del{text-decoration:line-through;}
/************* end reset all *************/


html {
    font-size:100.01%;
```

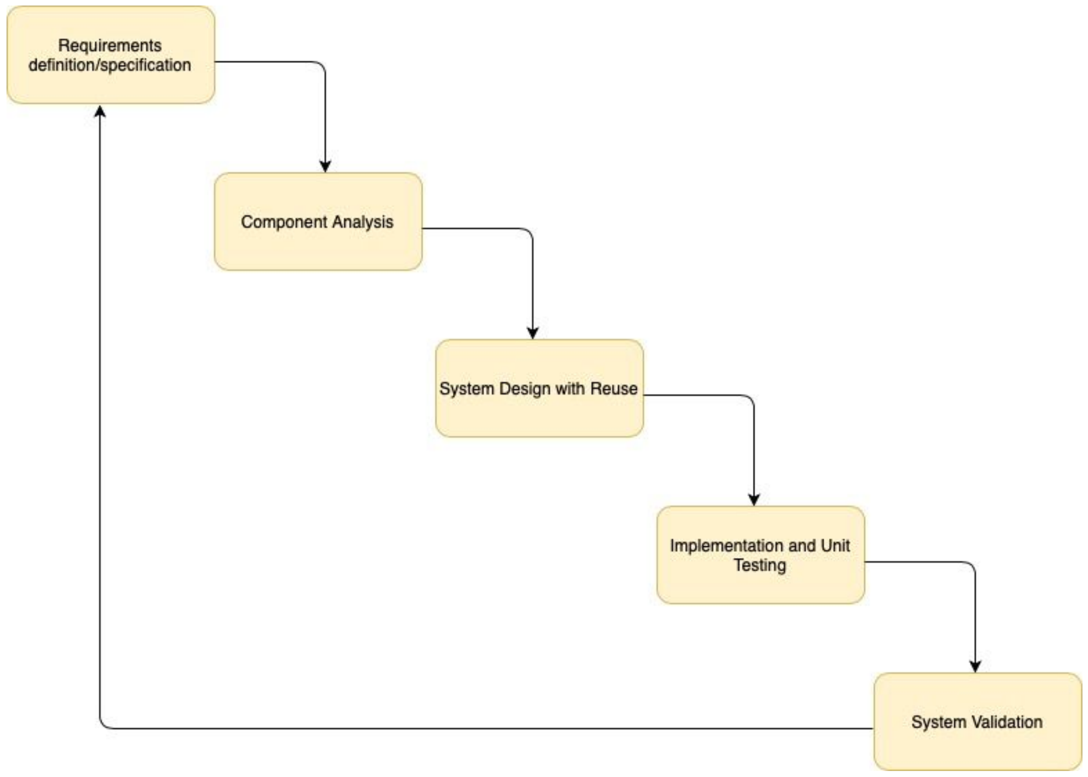
New Stylesheet loaded, user stylesheet changes are no longer used. Please save any changes in Style Editor, otherwise they may be lost

OK

Unit Tests can be found here: test
There are unit tests for the components which we modified and created a script for. These tests ensure that the components are still functioning as they should after our changes.

- devtools/server/tests/chrome/test_inspector-changeattrs.html
- devtools/server/tests/chrome/test_inspector-changevalue.html
- devtools/client/inspector/changes/test/browser_changes_copy_all_changes.js
- devtools/client/inspector/changes/test/browser_changes_copy_rule.js

Software Development Process


Requirements definition/specification
Component Analysis
System Design with Reuse
Implementation and Unit Testing
System Validation

The software development process we followed was what we had planned for in deliverable 1 which was a combination of a waterfall and reuse oriented plan. We were going to repeat this process for each bug that we decided to fix.

Requirements/definition specification: this was done by reading the bug documentation on the firefox website (bug link), and understanding the code, we also did this step by analyzing the bug and writing what we understood as required which included a detailed description, estimated time of work, and where the bugs are in the code.

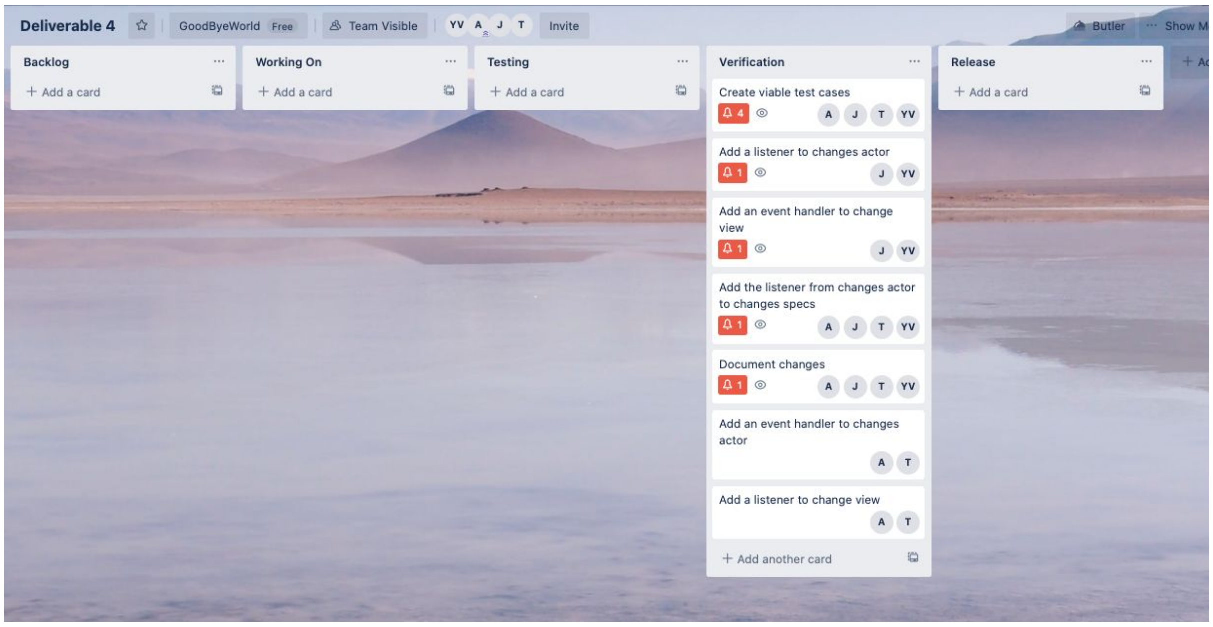
Component Analysis: In this step we understood how the components worked, this included understanding the actors such as changes actor, browser context actor, the style sheet actor. Also understanding the changes specs which is the list of events. And changing the view is where we put the alert in the front end.

System Design with Reuse: Since we were implementing a feature we did need to design how this is going to work with each other. We had to modify changes.js as there were already events there so we had to add our css change event to that class. We also had to figure out how we are going to implement and figure out how the change was done in the backend and then pass a prompt for the front end to put the alert up.

Implementation and Unit Testing: We all worked on this bug together following a pair programming approach. We created a branch for the bug called feature-1500979. We followed a test driven development approach where we created a set of acceptance test cases that would initially fail and would later pass after the implementation is complete (this commit and tdd can be found here: commit). We then proceeded to modify the existing code in order to fix the problem in pieces. All the commits for this can be found here: commit.

System Validation: We then run the test cases we initially produced to ensure that our changes fixed the problem and to verify that nothing else was negatively affected. This can be seen from the acceptance tests in this document. After verifying the changes we then created a pull request to merge our branch with the master branch. We assigned the pull request to our othes, so that they can verify the new changes going into master. This can be seen here: commit.

We tracked all our work using trello:



Deliverable 4 | GoodByeWorld Free | Team Visible | YV A J T | Invite | Butler | Show M

Backlog
+ Add a card

Working On
+ Add a card

Testing
+ Add a card

Verification
- Create viable test cases — 4 — A J T YV
- Add a listener to changes actor — 1 — J YV
- Add an event handler to change view — 1 — J YV
- Add the listener from changes actor to changes specs — 1 — A J T YV
- Document changes — 1 — A J T YV
- Add an event handler to changes actor — A T
- Add a listener to change view — A T
+ Add another card

Release
+ Add a card