MAKING CROSS-BROWSER TESTS Beautiful
Ask me about:

- Continuous deployment
- Scaling automation
- Life @ startups
Agenda

- Why
- How
- Problems
- Solutions
- Lessons Learned
WHAT DO YOU WANT TO GET OUT OF THIS SESSION?
WHY ?
● Increase confidence your app works in all browsers

● Can easily test changes in browsers

● Save time from manually testing features
HOW ?
Answer the following questions:

- Which browsers will be supported?
- What is the most important workflow to test?
- How will the tests be run?
Write automated tests for a student loan refinance application
### About You

We value your privacy. All information is kept completely confidential. View our privacy policy.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST NAME</td>
<td>Enter First Name</td>
</tr>
<tr>
<td>LAST NAME</td>
<td>Enter Last Name</td>
</tr>
<tr>
<td>YOUR HIGHEST DEGREE</td>
<td>Choose One</td>
</tr>
<tr>
<td>SCHOOL</td>
<td>Enter School Name</td>
</tr>
<tr>
<td>GRADUATION DATE</td>
<td>MM / YYYY</td>
</tr>
<tr>
<td>ANNUAL INCOME</td>
<td>$ Enter Your Annual Income (Not Household)</td>
</tr>
<tr>
<td>CASH + RETIREMENT + INVESTMENT</td>
<td>$ Enter Estimated Total</td>
</tr>
<tr>
<td>FULL STUDENT LOAN BALANCE</td>
<td>$ Approximate Amount ($5,000 Minimum)</td>
</tr>
</tbody>
</table>
STUDENT LOAN REFI RATES

2.76% – 6.24% Variable APR WITH AUTOPAY

OR

3.75% – 6.64% Fixed APR WITH AUTOPAY
Don’t know how application works in other browsers
SOLUTION:

Implement automated cross-browser tests
## Step 1: Decide Supported Browsers

<table>
<thead>
<tr>
<th>Browser</th>
<th>Visits</th>
<th>Contribution to total:</th>
<th>Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrome</td>
<td>151,346</td>
<td>40.59%</td>
<td></td>
</tr>
<tr>
<td>Firefox</td>
<td>92,607</td>
<td>24.84%</td>
<td></td>
</tr>
<tr>
<td>Internet Explorer</td>
<td>76,795</td>
<td>20.60%</td>
<td></td>
</tr>
<tr>
<td>Safari</td>
<td>36,584</td>
<td>9.81%</td>
<td></td>
</tr>
<tr>
<td>Mozilla Compatible Agent</td>
<td>6,376</td>
<td>1.71%</td>
<td></td>
</tr>
<tr>
<td>Opera</td>
<td>3,709</td>
<td>0.99%</td>
<td></td>
</tr>
<tr>
<td>Android Browser</td>
<td>3,321</td>
<td>0.89%</td>
<td></td>
</tr>
<tr>
<td>IE with Chrome Frame</td>
<td>686</td>
<td>0.18%</td>
<td></td>
</tr>
<tr>
<td>RockMelt</td>
<td>459</td>
<td>0.12%</td>
<td></td>
</tr>
<tr>
<td>Opera Mini</td>
<td>361</td>
<td>0.10%</td>
<td></td>
</tr>
</tbody>
</table>
**Step 1: Decide Supported Browsers**

<table>
<thead>
<tr>
<th></th>
<th>Chrome</th>
<th>IE/Edge</th>
<th>Firefox</th>
<th>Safari</th>
<th>Opera</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>75.1 %</td>
<td>4.8 %</td>
<td>14.1 %</td>
<td>3.6 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>February</td>
<td>74.1 %</td>
<td>4.8 %</td>
<td>15.0 %</td>
<td>3.6 %</td>
<td>1.0 %</td>
</tr>
<tr>
<td>January</td>
<td>73.7 %</td>
<td>4.9 %</td>
<td>15.4 %</td>
<td>3.6 %</td>
<td>1.0 %</td>
</tr>
</tbody>
</table>
Step 2: Decide what to automate

- What is the most *crucial* workflow to automate?
Step 3: Decide how to run tests
Step 3: Decide how to run tests
Step 4: Write some tests

```
'Allow user to submit rate check for SLR': function (browser) {
    var checkRatePage = browser.page.checkRatePage();

    checkRatePage.navigateToCheckRatePage(browser);

    checkRatePage.fillOutCheckRateForm('Deborah', 'Tester', '200000', '100000', '400000', '2000', 'deborah.tester@gmail.com');

    browser.expect.element('.rate-quote-form').to.be.present.before(10000);
}
```
var webdriver = require('selenium-webdriver')
By = webdriver.By;

var driver = new webdriver.Builder()
  .withCapabilities({
    'browserName': 'firefox',
    'platform': 'OS X 10.11',
    'screenResolution': '1920x1440',
  })
  .build();
IT SHOULD BE AS EASY AS CHANGING THE DRIVER, RIGHT?
PROBLEM #1

PAGE ELEMENTS
- Cannot interact with elements in the same way across browsers
- Dropdowns, radio buttons and checkboxes are tricky
Element is not clickable

EXPECTED:
Webdriver to click the link in Chrome

ACTUAL:
Element is not clickable at point (326, 79.5)
```html
<input id="citizenship_status" name="citizenship_status">
<label for="citizenship_status">
    "I am a U.S. citizen or Permanent Resident."
</label>
```

```javascript
driver.findElementById('citizenship_status').click()
```

```javascript
driver.findElementByCss('label[for="citizenship_status"]').click()
```
Alternate clicking methods

```java
Actions(driver).click(webElement).build().perform();

JavascriptExecutor js = (JavascriptExecutor) driver;
js.executeScript("arguments[0].click();", webElement);
```
TIMING ISSUES
- Need to wait for elements....

- Running tests locally vs running remotely
No Such Element

EXPECTED:
Webdriver to find element

ACTUAL:
NoSuchElementException:
Unable to locate element: {
"method": "css selector",
"selector": "selectorName"}
IMPLICIT WAITS

Wait for a set amount of time

driver.manage().timeouts().implicitlyWait(10);
webElement element = driver.FindElement(By.id('check-rate-results'));
**EXPLICIT WAITS**

Wait for an event up until a certain amount of time

```java
WebDriver wait = new WebDriverWait(driver, 10);
webElement element = wait.until
(ExpectedConditions.elementToBeClickable(By.id('check-rate-results')));
```
PROBLEM # 3

DRIVER CAPABILITIES
- Drivers are managed separately
- Native capabilities differ
- Same functionality isn’t always available
Offer Letter, Statements, and Other Documents

Drop your document file here or browse

Supported file types: JPG, PNG, or PDF

uploadID: function (browser) {
  return this.setValue('input[type=file]', '/path/to/image/file')
  .waitForElementVisible('.icon-file-upload-success', 50000);
}
The Safari Driver is implemented in JS and does not have the privileges necessary to manipulate an `<input type = “file”>` element. Therefore, the SafariDriver does not support file uploads.
Student Loan Refi: Rate Check

About You

We value your privacy. All information is kept completely confidential. View our privacy policy.

FIRST NAME
LAST NAME
YOUR HIGHEST DEGREE
SCHOOL
GRADUATION DATE
ANNUAL INCOME

Required

GET YOUR ESTIMATED RATE

Rate Check
Rate Check Results

STUDENT LOAN REFINANCE RATES

2.23% – 5.78% Variable APR WITH AUTOPAY
3.50% – 7.45% Fixed APR WITH AUTOPAY

Enter Your Annual Income (Not Household)
- Maximize browser window
  
  ```javascript
  driver.manage().window().maximize()
  ```

- Set a specific resolution at run-time
  
  ```javascript
  driver.manage().window().setSize(1280, 800)
  ```

- Scroll an element into view
  
  ```javascript
  driver.executeScript('arguments[0].scrollIntoView(true);', element)
  ```
START TESTING
EARLY
MAKE YOUR TEST SCRIPTS UNIVERSAL
USE WAITS AS NEEDED
Run tests in CI regularly
QUESTIONS?

LinkedIn: meaghan-lewis
Twitter: @jammeaghanlewis
Email: meaghan@lever.co