Introduction to
Automation Testing with Selenium

Software Testing

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Agenda

- What is automation testing?
- What should be automated?
- What should not be automated?
- How to choose automation tools?
- Front-end automation using Selenium IDE
- Web element locators

What is automation testing?

- **Test automation** is the use of special software (separate from the software being tested) to control the execution of tests and the comparison of actual outcomes with predicted outcomes
- **Test automation** can automate some repetitive but necessary tasks in a formalized testing process already in place, or add additional testing that would be difficult to perform manually

Choosing automation scope

- A key indicator in evaluating automation strategy and scope is ROI (Return of Investment).

- Areas with usually **high ROI** for automation:

  - Repetitive / frequent tests (examples: smoke, sanity, regression suites)

  - Test cases that are impossible for manual testing (example: sending a lot of transactions for a short period of time)

  - Test cases that run on many different hardware and software platforms and configurations (example: compatibility tests)

Choosing automation scope

- Areas with usually **low ROI** for automation:

  - low priority test cases (little importance to the business)

  - rarely executed tests

  - tests for areas that are constantly changing (i.e. maintenance effort is bigger than actual benefit of automation)

Choosing automation tools

- Do you have skilled resource to work on automation?
- What is your budget?
- Does the tool satisfy your testing needs?
- Do you want automation tool for only your project needs or you are looking for a common tool for all projects in your company?
- Which testing types does it support?
- Does the tool support easy interface to create and maintain test scripts?

Choosing automation tools

- How easy it is to provide input test data for complex or load tests?
- Does it provide the powerful reporting with graphical interface?
- Does it integrate well with your other testing tools like project planning and test management tools?
- Does the tool support different platforms and different software types?
- Do you have enough documentation and support of the tool?

Front-end test automation with Selenium

“Selenium automates browsers.”

Software testing framework aiding automation testing of web applications.

Two parts:

- **Selenium WebDriver** – collection of language specific bindings (libraries) used for browser-based automation testing; supports most used programming languages (Java, JavaScript, C#, Ruby, Python, etc.)

- **Selenium IDE** – record/playback tool for non-coded simple automation scripts

Selenium IDE

- Automation tool for testing web sites/applications
- Chrome / Firefox plug-in

Installation:

1)Open Chrome or Firefox browser

2)Install Selenium IDE plug-in:

Chrome plug-in

Firefox plug-in

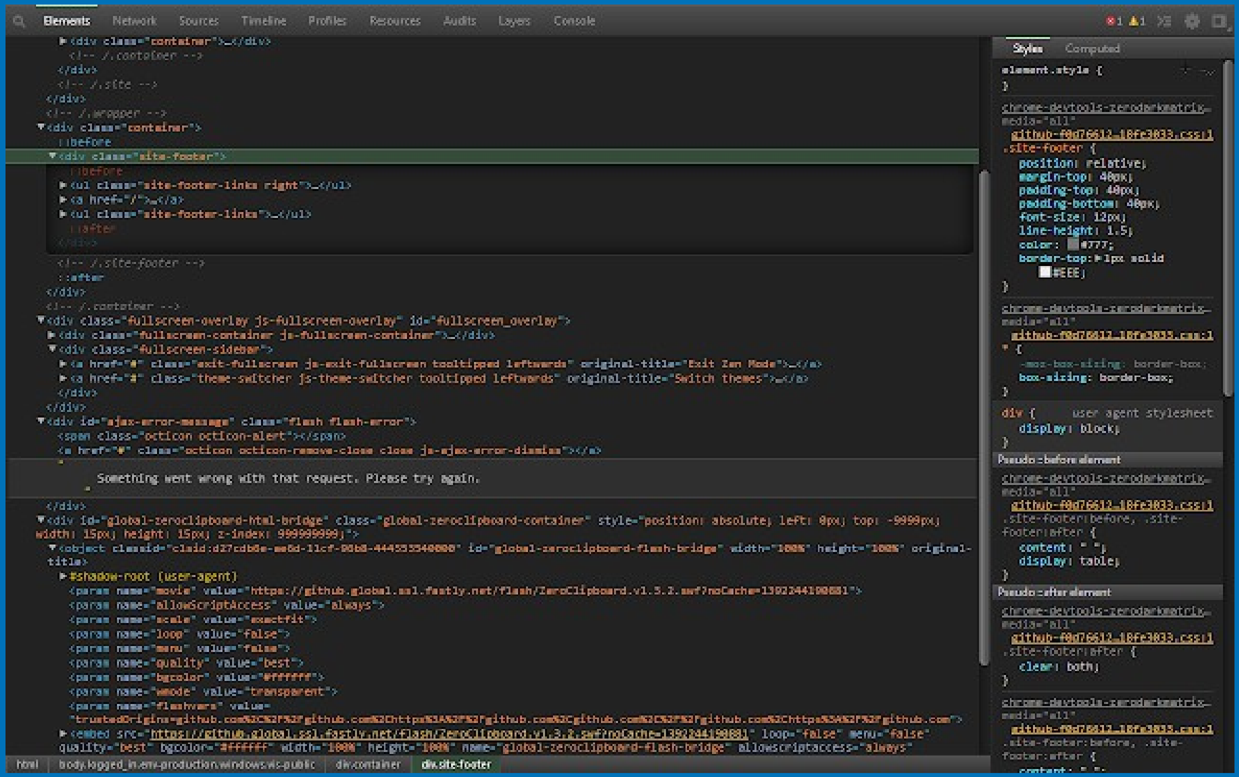
3)Restart browser

4)Launch plug-in from toolbar icon

Additional tools

- All browsers: F12 opens browser’s developer tool panel

- Use it for:
  - element inspection
  - defects investigation
  - debugging
  - HTML/CSS manipulation
  - performance metrics
  - etc.



```
    ▶<div class="container">…</div>
      <!-- /.container -->
    </div>
    <!-- /.site -->
  </div>
  <!-- /.wrapper -->
▼<div class="container">
    ::before
  ▼<div class="site-footer">
      ::before
    ▶<ul class="site-footer-links right">…</ul>
    ▶<a href="/">…</a>
    ▶<ul class="site-footer-links">…</ul>
      ::after
    </div>
    <!-- /.site-footer -->
    ::after
  </div>
  <!-- /.container -->
▼<div class="fullscreen-overlay js-fullscreen-overlay" id="fullscreen_overlay">
  ▶<div class="fullscreen-container js-fullscreen-container">…</div>
  ▼<div class="fullscreen-sidebar">
    ▶<a href="#" class="exit-fullscreen js-exit-fullscreen tooltipped leftwards" original-title="Exit Zen Mode">…</a>
    ▶<a href="#" class="theme-switcher js-theme-switcher tooltipped leftwards" original-title="Switch themes">…</a>
    </div>
  </div>
▼<div id="ajax-error-message" class="flash flash-error">
    <span class="octicon octicon-alert"></span>
    <a href="#" class="octicon octicon-remove-close close js-ajax-error-dismiss"></a>
    "
      Something went wrong with that request. Please try again.
    "
  </div>
▼<div id="global-zeroclipboard-html-bridge" class="global-zeroclipboard-container" style="position: absolute; left: 0px; top: -9999px;
width: 15px; height: 15px; z-index: 999999999;">
  ▼<object classid="clsid:d27cdb6e-ae6d-11cf-96b8-444553540000" id="global-zeroclipboard-flash-bridge" width="100%" height="100%" original-
  title>
    ▶#shadow-root (user-agent)
      <param name="movie" value="https://github.global.ssl.fastly.net/flash/ZeroClipboard.v1.3.2.swf?noCache=1392244190881">
      <param name="allowScriptAccess" value="always">
      <param name="scale" value="exactfit">
      <param name="loop" value="false">
      <param name="menu" value="false">
      <param name="quality" value="best">
      <param name="bgcolor" value="#ffffff">
      <param name="wmode" value="transparent">
      <param name="flashvars" value=
      "trustedOrigins=github.com%2C%2F%2Fgithub.com%2Chttps%3A%2F%2Fgithub.com%2Cgithub.com%2C%2F%2Fgithub.com%2Chttps%3A%2F%2Fgithub.com">
    ▶<embed src="https://github.global.ssl.fastly.net/flash/ZeroClipboard.v1.3.2.swf?noCache=1392244190881" loop="false" menu="false"
    quality="best" bgcolor="#ffffff" width="100%" height="100%" name="global-zeroclipboard-flash-bridge" allowscriptaccess="always"
```

```
element.style {
}
chrome-devtools-zerodarkmatrix…
media="all"
  github-f0d76612-18fe3033.css:1
.site-footer {
  position: relative;
  margin-top: 40px;
  padding-top: 40px;
  padding-bottom: 40px;
  font-size: 12px;
  line-height: 1.5;
  color: ▨#777;
  border-top:▶1px solid
    □#EEE;
}
chrome-devtools-zerodarkmatrix…
media="all"
  github-f0d76612-18fe3033.css:1
* {
  -moz-box-sizing: border-box;
  box-sizing: border-box;
}
div {        user agent stylesheet
  display: block;
}
Pseudo ::before element
chrome-devtools-zerodarkmatrix…
media="all"
  github-f0d76612-18fe3033.css:1
.site-footer:before, .site-
footer:after {
  content: " ";
  display: table;
}
Pseudo ::after element
chrome-devtools-zerodarkmatrix…
media="all"
  github-f0d76612-18fe3033.css:1
.site-footer:after {
  clear: both;
}
chrome-devtools-zerodarkmatrix…
media="all"
  github-f0d76612-18fe3033.css:1
.site-footer:before, .site-
footer:after {
  content: " ";
```

Selenium Locators

- Selenium uses what is called locators to find and match the elements of your page that it needs to interact with
- We will focus on the following Selenium locators:

  - ID

  - Name

  - Link

  - CSS

  - XPath

Selenium Locators – Id, Name, Link

- **Id**
  Example HTML code: <input id="username"/>
  Locator syntax: ***id=username***

- **Name**
  Example HTML code: <input name="login-form"/>
  Locator syntax: ***name=login-form***

- **Link**
  Example HTML code: <a href=”#” target=_blank>Contacts</a>
  Locator syntax: ***link=Contacts***

Selenium Locators - CSS

- Using tag element

css=h1

- Using CSS class attributes in CSS selectors

css=div.centerdiv

- Using element IDs in CSS selectors

css=div#divinthecenter

- Using child nodes to find the element

css=div.leftdiv > input

- Finding elements by their attributes

css=input[id='button_1'][value='Button with ID']

Selenium Locators - XPath

- Using absolute path (not recommended)

xpath=/html/body/div[2]/div[3]/input

- Using XPath to find the nth element of a type (relative path)

xpath=//div[2]//input[2]

- Using element attributes in XPath queries

xpath=//div[@class='classname']

- Finding an element by the text it contains

xpath=//div[contains(text(),'inner text')]

More on Xpath

XPath is used to navigate through elements and attributes in an XML and HTML document.

- XPath is a syntax for defining parts of an XML and HTML documents
- XPath uses path expressions to navigate in XML and HTML documents
- XPath contains a library of standard functions
- XPath is a W3C recommendation

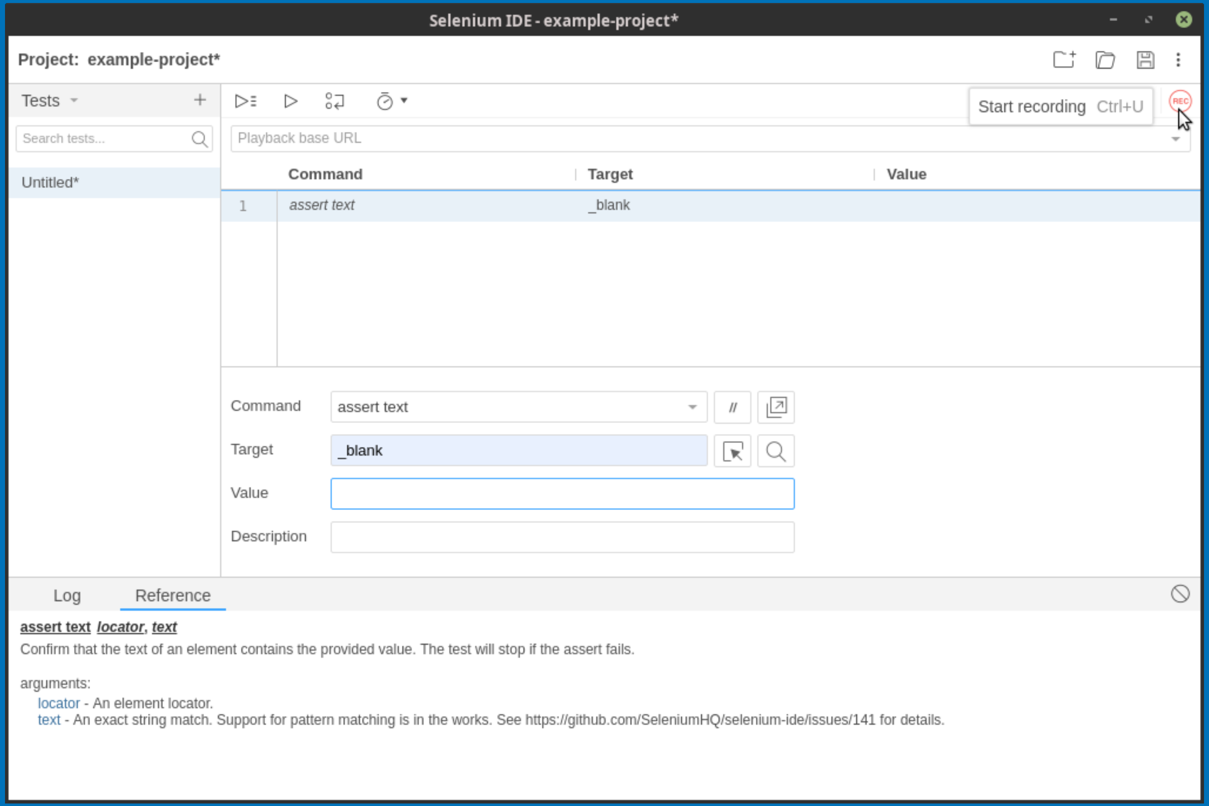
Xpath syntax

Expression	Description
nodename	Selects all nodes with the name "*nodename*"
/	Selects from the root node
//	Selects nodes in the document from the current node that match the selection no matter where they are
.	Selects the current node
..	Selects the parent of the current node
@	Selects attributes

For complete list of Xpath expressions, click here

Testing with Selenium IDE

- Test suites
- Test cases
- Actions
- Assertions
- Verifications



	Command	Target	Value
1	*assert text*	_blank	

Command: assert text

Target: _blank

Value:

Description:

assert text ***locator*, *text***

Confirm that the text of an element contains the provided value. The test will stop if the assert fails.

arguments:

locator - An element locator.

text - An exact string match. Support for pattern matching is in the works. See https://github.com/SeleniumHQ/selenium-ide/issues/141 for details.

Resources

- W3Schools Xpath Tutorial
- Selenium IDE – Getting Started

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