# Selenium Python Bindings

***Release 2***

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# Contents

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**Note:** This is not an official documentation. If you would like to contribute to this documentation, you can fork this project in GitHub and send pull requests. You can also send your feedback to my email: baiju.m.mail AT gmail DOT com. So far 50+ community members have contributed to this project (See the closed pull requests). I encourage contributors to add more sections and make it an awesome documentation! If you know any translation of this document, please send a PR to update the below list.

**Translations:**

- Chinese
- Japanese

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CHAPTER 1

# Installation

## 1.1 Introduction

Selenium Python bindings provides a simple API to write functional/acceptance tests using Selenium WebDriver. Through Selenium Python API you can access all functionalities of Selenium WebDriver in an intuitive way.

Selenium Python bindings provide a convenient API to access Selenium WebDrivers like Firefox, Ie, Chrome, Remote etc. The current supported Python versions are 3.5 and above.

This documentation explains Selenium 2 WebDriver API. Selenium 1 / Selenium RC API is not covered here.

## 1.2 Installing Python bindings for Selenium

Use pip to install the selenium package. Python 3 has pip available in the standard library. Using *pip*, you can install selenium like this:

```
pip install selenium
```

You may consider using virtualenv to create isolated Python environments. Python 3 has venv which is almost the same as virtualenv.

You can also download Python bindings for Selenium from the PyPI page for selenium package. and install manually.

## 1.3 Instructions for Windows users

1. Install Python 3 using the MSI available in python.org download page.
2. Start a command prompt using the `cmd.exe` program and run the `pip` command as given below to install *selenium*.

```
C:\Python39\Scripts\pip.exe install selenium
```

Now you can run your test scripts using Python. For example, if you have created a Selenium based script and saved it inside `C:\my_selenium_script.py`, you can run it like this:

```
C:\Python39\python.exe C:\my_selenium_script.py
```

## 1.4 Installing from Git sources

To build Selenium Python from the source code, clone the official repository. It contains the source code for all official Selenium flavors, like Python, Java, Ruby and others. The Python code resides in the `/py` directory. To build, you will also need the Bazel build system.

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**Note:** Currently, as Selenium gets near to the 4.0.0 release, it requires Bazel 3.2.0 (Install instructions), even though 3.3.0 is already available.

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To build a Wheel from the sources, run the following command from the repository root:

```
bazel //py:selenium-wheel
```

This command will prepare the source code with some preprocessed JS files needed by some webdriver modules and build the `.whl` package inside the `./bazel-bin/py/` directory. Afterwards, you can use `pip` to install it.

## 1.5 Drivers

Selenium requires a driver to interface with the chosen browser. Firefox, for example, requires geckodriver, which needs to be installed before the below examples can be run. Make sure it's in your *PATH*, e. g., place it in */usr/bin* or */usr/local/bin*.

Failure to observe this step will give you an error *selenium.common.exceptions.WebDriverException: Message: 'geckodriver' executable needs to be in PATH.*

Other supported browsers will have their own drivers available. Links to some of the more popular browser drivers follow.

| | |
|---|---|
| **Chrome**: | https://sites.google.com/chromium.org/driver/ |
| **Edge**: | https://developer.microsoft.com/en-us/microsoft-edge/tools/webdriver/ |
| **Firefox**: | https://github.com/mozilla/geckodriver/releases |
| **Safari**: | https://webkit.org/blog/6900/webdriver-support-in-safari-10/ |

For more information about driver installation, please refer the official documentation.

## 1.6 Downloading Selenium server

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**Note: The Selenium server is only required if you want to use the remote WebDriver**. See the *Using Selenium with remote WebDriver* section for more details. If you are a beginner learning Selenium, you can skip this section

and proceed with next chapter.

Selenium server is a Java program. Java Runtime Environment (JRE) 1.6 or newer version is recommended to run Selenium server.

You can download Selenium server 2.x from the download page of selenium website. The file name should be something like this: `selenium-server-standalone-2.x.x.jar`. You can always download the latest 2.x version of Selenium server.

If Java Runtime Environment (JRE) is not installed in your system, you can download the JRE from the Oracle website. If you are using a GNU/Linux system and have root access in your system, you can also use your operating system instructions to install JRE.

If *java* command is available in the PATH (environment variable), you can start the Selenium server using this command:

```
java -jar selenium-server-standalone-2.x.x.jar
```

Replace *2.x.x* with the actual version of Selenium server you downloaded from the site.

If JRE is installed as a non-root user and/or if it is not available in the PATH (environment variable), you can type the relative or absolute path to the *java* command. Similarly, you can provide a relative or absolute path to Selenium server jar file. Then, the command will look something like this:

```
/path/to/java -jar /path/to/selenium-server-standalone-2.x.x.jar
```

CHAPTER 2

# Getting Started

## 2.1 Simple Usage

If you have installed Selenium Python bindings, you can start using it from Python like this.

```
from selenium import webdriver
from selenium.webdriver.common.keys import Keys

driver = webdriver.Firefox()
driver.get("http://www.python.org")
assert "Python" in driver.title
elem = driver.find_element_by_name("q")
elem.clear()
elem.send_keys("pycon")
elem.send_keys(Keys.RETURN)
assert "No results found." not in driver.page_source
driver.close()
```

The above script can be saved into a file (eg:- *python_org_search.py*), then it can be run like this:

```
python python_org_search.py
```

The *python* which you are running should have the *selenium* module installed.

## 2.2 Example Explained

The *selenium.webdriver* module provides all the WebDriver implementations. Currently supported WebDriver implementations are Firefox, Chrome, IE and Remote. The *Keys* class provide keys in the keyboard like RETURN, F1, ALT etc.

```
from selenium import webdriver
from selenium.webdriver.common.keys import Keys
```

Next, the instance of Firefox WebDriver is created.

```
driver = webdriver.Firefox()
```

The *driver.get* method will navigate to a page given by the URL. WebDriver will wait until the page has fully loaded (that is, the "onload" event has fired) before returning control to your test or script. *Be aware that if your page uses a lot of AJAX on load then WebDriver may not know when it has completely loaded*:

```
driver.get("http://www.python.org")
```

The next line is an assertion to confirm that title has "Python" word in it:

```
assert "Python" in driver.title
```

WebDriver offers a number of ways to find elements using one of the *find_element_by_** methods. For example, the input text element can be located by its *name* attribute using *find_element_by_name* method. A detailed explanation of finding elements is available in the *Locating Elements* chapter:

```
elem = driver.find_element_by_name("q")
```

Next, we are sending keys, this is similar to entering keys using your keyboard. Special keys can be sent using *Keys* class imported from *selenium.webdriver.common.keys*. To be safe, we'll first clear any pre-populated text in the input field (e.g. "Search") so it doesn't affect our search results:

```
elem.clear()
elem.send_keys("pycon")
elem.send_keys(Keys.RETURN)
```

After submission of the page, you should get the result if there is any. To ensure that some results are found, make an assertion:

```
assert "No results found." not in driver.page_source
```

Finally, the browser window is closed. You can also call *quit* method instead of *close*. The *quit* will exit entire browser whereas *close* will close one tab, but if just one tab was open, by default most browser will exit entirely.:

```
driver.close()
```

## 2.3 Using Selenium to write tests

Selenium is mostly used for writing test cases. The *selenium* package itself doesn't provide a testing tool/framework. You can write test cases using Python's unittest module. The other options for a tool/framework are pytest and nose.

In this chapter, we use *unittest* as the framework of choice. Here is the modified example which uses unittest module. This is a test for *python.org* search functionality:

```
import unittest
from selenium import webdriver
from selenium.webdriver.common.keys import Keys

class PythonOrgSearch(unittest.TestCase):

    def setUp(self):
        self.driver = webdriver.Firefox()

```

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```
    def test_search_in_python_org(self):
        driver = self.driver
        driver.get("http://www.python.org")
        self.assertIn("Python", driver.title)
        elem = driver.find_element_by_name("q")
        elem.send_keys("pycon")
        elem.send_keys(Keys.RETURN)
        assert "No results found." not in driver.page_source


    def tearDown(self):
        self.driver.close()

if __name__ == "__main__":
    unittest.main()
```

You can run the above test case from a shell like this:

```
python test_python_org_search.py
.
----------------------------------------------------------------------
Ran 1 test in 15.566s

OK
```

The above result shows that the test has been successfully completed.

Note: To run the above test in IPython or Jupyter, you should pass a couple of arguments to the *main* function as shown below:

```
unittest.main(argv=['first-arg-is-ignored'], exit=False)
```

## 2.4 Walkthrough of the example

Initially, all the basic modules required are imported. The unittest module is a built-in Python based on Java's JUnit. This module provides the framework for organizing the test cases. The *selenium.webdriver* module provides all the WebDriver implementations. Currently supported WebDriver implementations are Firefox, Chrome, IE and Remote. The *Keys* class provides keys in the keyboard like RETURN, F1, ALT etc.

```
import unittest
from selenium import webdriver
from selenium.webdriver.common.keys import Keys
```

The test case class is inherited from *unittest.TestCase*. Inheriting from *TestCase* class is the way to tell *unittest* module that this is a test case:

```
class PythonOrgSearch(unittest.TestCase):
```

The *setUp* is part of initialization, this method will get called before every test function which you are going to write in this test case class. Here you are creating the instance of Firefox WebDriver.

```
def setUp(self):
    self.driver = webdriver.Firefox()
```

This is the test case method. The test case method should always start with characters *test*. The first line inside this method create a local reference to the driver object created in *setUp* method.

```
def test_search_in_python_org(self):
    driver = self.driver
```

The *driver.get* method will navigate to a page given by the URL. WebDriver will wait until the page has fully loaded (that is, the "onload" event has fired) before returning control to your test or script. *Be aware that if your page uses a lot of AJAX on load then WebDriver may not know when it has completely loaded*:

```
driver.get("http://www.python.org")
```

The next line is an assertion to confirm that title has "Python" word in it:

```
self.assertIn("Python", driver.title)
```

WebDriver offers a number of ways to find elements using one of the *find_element_by_** methods. For example, the input text element can be located by its *name* attribute using *find_element_by_name* method. Detailed explanation of finding elements is available in the *Locating Elements* chapter:

```
elem = driver.find_element_by_name("q")
```

Next, we are sending keys, this is similar to entering keys using your keyboard. Special keys can be send using *Keys* class imported from *selenium.webdriver.common.keys*:

```
elem.send_keys("pycon")
elem.send_keys(Keys.RETURN)
```

After submission of the page, you should get the result as per search if there is any. To ensure that some results are found, make an assertion:

```
assert "No results found." not in driver.page_source
```

The *tearDown* method will get called after every test method. This is a place to do all cleanup actions. In the current method, the browser window is closed. You can also call *quit* method instead of *close*. The *quit* will exit the entire browser, whereas *close* will close a tab, but if it is the only tab opened, by default most browser will exit entirely.:

```
def tearDown(self):
    self.driver.close()
```

Final lines are some boiler plate code to run the test suite:

```
if __name__ == "__main__":
    unittest.main()
```

## 2.5 Using Selenium with remote WebDriver

To use the remote WebDriver, you should have Selenium server running. To run the server, use this command:

```
java -jar selenium-server-standalone-2.x.x.jar
```

While running the Selenium server, you could see a message looking like this:

```
15:43:07.541 INFO - RemoteWebDriver instances should connect to: http://127.0.0.
↪1:4444/wd/hub
```

The above line says that you can use this URL for connecting to remote WebDriver. Here are some examples:

```
from selenium import webdriver
from selenium.webdriver.common.desired_capabilities import DesiredCapabilities

driver = webdriver.Remote(
   command_executor='http://127.0.0.1:4444/wd/hub',
   desired_capabilities=DesiredCapabilities.CHROME)

driver = webdriver.Remote(
   command_executor='http://127.0.0.1:4444/wd/hub',
   desired_capabilities=DesiredCapabilities.OPERA)

driver = webdriver.Remote(
   command_executor='http://127.0.0.1:4444/wd/hub',
   desired_capabilities=DesiredCapabilities.HTMLUNITWITHJS)
```

The desired capabilities is a dictionary, so instead of using the default dictionaries, you can specify the values explicitly:

```
driver = webdriver.Remote(
   command_executor='http://127.0.0.1:4444/wd/hub',
   desired_capabilities={'browserName': 'htmlunit',
                         'version': '2',
                        'javascriptEnabled': True})
```

# CHAPTER 3

# Navigating

The first thing you'll want to do with WebDriver is navigate to a link. The normal way to do this is by calling `get` method:

```
driver.get("http://www.google.com")
```

WebDriver will wait until the page has fully loaded (that is, the `onload` event has fired) before returning control to your test or script. *Be aware that if your page uses a lot of AJAX on load then WebDriver may not know when it has completely loaded*. If you need to ensure such pages are fully loaded then you can use *waits*.

## 3.1 Interacting with the page

Just being able to go to places isn't terribly useful. What we'd really like to do is to interact with the pages, or, more specifically, the HTML elements within a page. First of all, we need to find one. WebDriver offers a number of ways to find elements. For example, given an element defined as:

```
<input type="text" name="passwd" id="passwd-id" />
```

you could find it using any of:

```
element = driver.find_element_by_id("passwd-id")
element = driver.find_element_by_name("passwd")
element = driver.find_element_by_xpath("//input[@id='passwd-id']")
element = driver.find_element_by_css_selector("input#passwd-id")
```

You can also look for a link by its text, but be careful! The text must be an exact match! You should also be careful when using *XPATH in WebDriver*. If there's more than one element that matches the query, then only the first will be returned. If nothing can be found, a `NoSuchElementException` will be raised.

WebDriver has an "Object-based" API; we represent all types of elements using the same interface. This means that although you may see a lot of possible methods you could invoke when you hit your IDE's auto-complete key combination, not all of them will make sense or be valid. Don't worry! WebDriver will attempt to do the Right Thing,

and if you call a method that makes no sense ("setSelected()" on a "meta" tag, for example) an exception will be raised.

So, you've got an element. What can you do with it? First of all, you may want to enter some text into a text field:

```
element.send_keys("some text")
```

You can simulate pressing the arrow keys by using the "Keys" class:

```
element.send_keys(" and some", Keys.ARROW_DOWN)
```

It is possible to call *send_keys* on any element, which makes it possible to test keyboard shortcuts such as those used on GMail. A side-effect of this is that typing something into a text field won't automatically clear it. Instead, what you type will be appended to what's already there. You can easily clear the contents of a text field or textarea with the *clear* method:

```
element.clear()
```

## 3.2 Filling in forms

We've already seen how to enter text into a textarea or text field, but what about the other elements? You can "toggle" the state of the drop down, and you can use "setSelected" to set something like an *OPTION* tag selected. Dealing with *SELECT* tags isn't too bad:

```
element = driver.find_element_by_xpath("//select[@name='name']")
all_options = element.find_elements_by_tag_name("option")
for option in all_options:
    print("Value is: %s" % option.get_attribute("value"))
    option.click()
```

This will find the first "SELECT" element on the page, and cycle through each of its OPTIONs in turn, printing out their values, and selecting each in turn.

As you can see, this isn't the most efficient way of dealing with SELECT elements. WebDriver's support classes include one called a "Select", which provides useful methods for interacting with these:

```
from selenium.webdriver.support.ui import Select
select = Select(driver.find_element_by_name('name'))
select.select_by_index(index)
select.select_by_visible_text("text")
select.select_by_value(value)
```

WebDriver also provides features for deselecting all the selected options:

```
select = Select(driver.find_element_by_id('id'))
select.deselect_all()
```

This will deselect all OPTIONs from that particular SELECT on the page.

Suppose in a test, we need the list of all default selected options, Select class provides a property method that returns a list:

```
select = Select(driver.find_element_by_xpath("//select[@name='name']"))
all_selected_options = select.all_selected_options
```

To get all available options:

```
options = select.options
```

Once you've finished filling out the form, you probably want to submit it. One way to do this would be to find the "submit" button and click it:

```
# Assume the button has the ID "submit" :)
driver.find_element_by_id("submit").click()
```

Alternatively, WebDriver has the convenience method "submit" on every element. If you call this on an element within a form, WebDriver will walk up the DOM until it finds the enclosing form and then calls submit on that. If the element isn't in a form, then the `NoSuchElementException` will be raised:

```
element.submit()
```

## 3.3 Drag and drop

You can use drag and drop, either moving an element by a certain amount, or on to another element:

```
element = driver.find_element_by_name("source")
target = driver.find_element_by_name("target")

from selenium.webdriver import ActionChains
action_chains = ActionChains(driver)
action_chains.drag_and_drop(element, target).perform()
```

## 3.4 Moving between windows and frames

It's rare for a modern web application not to have any frames or to be constrained to a single window. WebDriver supports moving between named windows using the "switch_to_window" method:

```
driver.switch_to_window("windowName")
```

All calls to `driver` will now be interpreted as being directed to the particular window. But how do you know the window's name? Take a look at the javascript or link that opened it:

```
<a href="somewhere.html" target="windowName">Click here to open a new window</a>
```

Alternatively, you can pass a "window handle" to the "switch_to_window()" method. Knowing this, it's possible to iterate over every open window like so:

```
for handle in driver.window_handles:
    driver.switch_to_window(handle)
```

You can also swing from frame to frame (or into iframes):

```
driver.switch_to_frame("frameName")
```

It's possible to access subframes by separating the path with a dot, and you can specify the frame by its index too. That is:

```
driver.switch_to_frame("frameName.0.child")
```

would go to the frame named "child" of the first subframe of the frame called "frameName". **All frames are evaluated as if from *top*.**

Once we are done with working on frames, we will have to come back to the parent frame which can be done using:

```
driver.switch_to_default_content()
```

## 3.5 Popup dialogs

Selenium WebDriver has built-in support for handling popup dialog boxes. After you've triggered action that would open a popup, you can access the alert with the following:

```
alert = driver.switch_to.alert
```

This will return the currently open alert object. With this object, you can now accept, dismiss, read its contents or even type into a prompt. This interface works equally well on alerts, confirms, prompts. Refer to the API documentation for more information.

## 3.6 Navigation: history and location

Earlier, we covered navigating to a page using the "get" command ( `driver.get("http://www.example.com")`). As you've seen, WebDriver has a number of smaller, task-focused interfaces, and navigation is a useful task. To navigate to a page, you can use *get* method:

```
driver.get("http://www.example.com")
```

To move backward and forward in your browser's history:

```
driver.forward()
driver.back()
```

Please be aware that this functionality depends entirely on the underlying driver. It's just possible that something unexpected may happen when you call these methods if you're used to the behavior of one browser over another.

## 3.7 Cookies

Before moving to the next section of the tutorial, you may be interested in understanding how to use cookies. First of all, you need to be on the domain that the cookie will be valid for:

```
# Go to the correct domain
driver.get("http://www.example.com")

# Now set the cookie. This one's valid for the entire domain
cookie = {'name' : 'foo', 'value' : 'bar'}
driver.add_cookie(cookie)

# And now output all the available cookies for the current URL
driver.get_cookies()
```

CHAPTER 4

# Locating Elements

There are various strategies to locate elements in a page. You can use the most appropriate one for your case. Selenium provides the following methods to locate elements in a page:

- *find_element_by_id*
- *find_element_by_name*
- *find_element_by_xpath*
- *find_element_by_link_text*
- *find_element_by_partial_link_text*
- *find_element_by_tag_name*
- *find_element_by_class_name*
- *find_element_by_css_selector*

**To find multiple elements (these methods will return a list):**

- *find_elements_by_name*
- *find_elements_by_xpath*
- *find_elements_by_link_text*
- *find_elements_by_partial_link_text*
- *find_elements_by_tag_name*
- *find_elements_by_class_name*
- *find_elements_by_css_selector*

Apart from the public methods given above, there are two private methods which might be useful for locating page elements:

- *find_element*
- *find_elements*

Example usage:

```
from selenium.webdriver.common.by import By

driver.find_element(By.XPATH, '//button[text()="Some text"]')
driver.find_elements(By.XPATH, '//button')
```

These are the attributes available for *By* class:

```
ID = "id"
XPATH = "xpath"
LINK_TEXT = "link text"
PARTIAL_LINK_TEXT = "partial link text"
NAME = "name"
TAG_NAME = "tag name"
CLASS_NAME = "class name"
CSS_SELECTOR = "css selector"
```

## 4.1 Locating by Id

Use this when you know the *id* attribute of an element. With this strategy, the first element with a matching *id* attribute will be returned. If no element has a matching *id* attribute, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <form id="loginForm">
   <input name="username" type="text" />
   <input name="password" type="password" />
   <input name="continue" type="submit" value="Login" />
  </form>
 </body>
</html>
```

The form element can be located like this:

```
login_form = driver.find_element_by_id('loginForm')
```

## 4.2 Locating by Name

Use this when you know the *name* attribute of an element. With this strategy, the first element with a matching *name* attribute will be returned. If no element has a matching *name* attribute, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <form id="loginForm">
   <input name="username" type="text" />
   <input name="password" type="password" />
   <input name="continue" type="submit" value="Login" />
```

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```
   <input name="continue" type="button" value="Clear" />
  </form>
</body>
</html>
```

The username & password elements can be located like this:

```
username = driver.find_element_by_name('username')
password = driver.find_element_by_name('password')
```

This will give the "Login" button as it occurs before the "Clear" button:

```
continue = driver.find_element_by_name('continue')
```

## 4.3 Locating by XPath

XPath is the language used for locating nodes in an XML document. As HTML can be an implementation of XML (XHTML), Selenium users can leverage this powerful language to target elements in their web applications. XPath supports the simple methods of locating by id or name attributes and extends them by opening up all sorts of new possibilities such as locating the third checkbox on the page.

One of the main reasons for using XPath is when you don't have a suitable id or name attribute for the element you wish to locate. You can use XPath to either locate the element in absolute terms (not advised), or relative to an element that does have an id or name attribute. XPath locators can also be used to specify elements via attributes other than id and name.

Absolute XPaths contain the location of all elements from the root (html) and as a result are likely to fail with only the slightest adjustment to the application. By finding a nearby element with an id or name attribute (ideally a parent element) you can locate your target element based on the relationship. This is much less likely to change and can make your tests more robust.

For instance, consider this page source:

```
<html>
 <body>
  <form id="loginForm">
   <input name="username" type="text" />
   <input name="password" type="password" />
   <input name="continue" type="submit" value="Login" />
   <input name="continue" type="button" value="Clear" />
  </form>
</body>
</html>
```

The form elements can be located like this:

```
login_form = driver.find_element_by_xpath("/html/body/form[1]")
login_form = driver.find_element_by_xpath("//form[1]")
login_form = driver.find_element_by_xpath("//form[@id='loginForm']")
```

1. Absolute path (would break if the HTML was changed only slightly)
2. First form element in the HTML
3. The form element with attribute *id* set to *loginForm*

The username element can be located like this:

```
username = driver.find_element_by_xpath("//form[input/@name='username']")
username = driver.find_element_by_xpath("//form[@id='loginForm']/input[1]")
username = driver.find_element_by_xpath("//input[@name='username']")
```

1. First form element with an input child element with *name* set to *username*
2. First input child element of the form element with attribute *id* set to *loginForm*
3. First input element with attribute *name* set to *username*

The "Clear" button element can be located like this:

```
clear_button = driver.find_element_by_xpath("//input[@name='continue'][@type='button']
↪")
clear_button = driver.find_element_by_xpath("//form[@id='loginForm']/input[4]")
```

1. Input with attribute *name* set to *continue* and attribute *type* set to *button*
2. Fourth input child element of the form element with attribute *id* set to *loginForm*

These examples cover some basics, but in order to learn more, the following references are recommended:

- W3Schools XPath Tutorial
- W3C XPath Recommendation
- XPath Tutorial - with interactive examples.

Here is a couple of very useful Add-ons that can assist in discovering the XPath of an element:

- xPath Finder - Plugin to get the elements xPath.
- XPath Helper - for Google Chrome

## 4.4 Locating Hyperlinks by Link Text

Use this when you know the link text used within an anchor tag. With this strategy, the first element with the link text matching the provided value will be returned. If no element has a matching link text attribute, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <p>Are you sure you want to do this?</p>
  <a href="continue.html">Continue</a>
  <a href="cancel.html">Cancel</a>
</body>
</html>
```

The continue.html link can be located like this:

```
continue_link = driver.find_element_by_link_text('Continue')
continue_link = driver.find_element_by_partial_link_text('Conti')
```

## 4.5 Locating Elements by Tag Name

Use this when you want to locate an element by tag name. With this strategy, the first element with the given tag name will be returned. If no element has a matching tag name, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <h1>Welcome</h1>
  <p>Site content goes here.</p>
</body>
</html>
```

The heading (h1) element can be located like this:

```
heading1 = driver.find_element_by_tag_name('h1')
```

## 4.6 Locating Elements by Class Name

Use this when you want to locate an element by class name. With this strategy, the first element with the matching class name attribute will be returned. If no element has a matching class name attribute, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <p class="content">Site content goes here.</p>
</body>
</html>
```

The “p” element can be located like this:

```
content = driver.find_element_by_class_name('content')
```

## 4.7 Locating Elements by CSS Selectors

Use this when you want to locate an element using CSS selector syntax. With this strategy, the first element matching the given CSS selector will be returned. If no element matches the provided CSS selector, a `NoSuchElementException` will be raised.

For instance, consider this page source:

```
<html>
 <body>
  <p class="content">Site content goes here.</p>
</body>
</html>
```

The “p” element can be located like this:

```
content = driver.find_element_by_css_selector('p.content')
```

Sauce Labs has good documentation on CSS selectors.

CHAPTER 5

# Waits

These days, most of the web apps are using AJAX techniques. When a page is loaded by the browser, the elements within that page may load at different time intervals. This makes locating elements difficult: if an element is not yet present in the DOM, a locate function will raise an *ElementNotVisibleException* exception. Using waits, we can solve this issue. Waiting provides some slack between actions performed - mostly locating an element or any other operation with the element.

Selenium Webdriver provides two types of waits - implicit & explicit. An explicit wait makes WebDriver wait for a certain condition to occur before proceeding further with execution. An implicit wait makes WebDriver poll the DOM for a certain amount of time when trying to locate an element.

## 5.1 Explicit Waits

An explicit wait is a code you define to wait for a certain condition to occur before proceeding further in the code. The extreme case of this is time.sleep(), which sets the condition to an exact time period to wait. There are some convenience methods provided that help you write code that will wait only as long as required. WebDriverWait in combination with ExpectedCondition is one way this can be accomplished.

```
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.support.ui import WebDriverWait
from selenium.webdriver.support import expected_conditions as EC

driver = webdriver.Firefox()
driver.get("http://somedomain/url_that_delays_loading")
try:
    element = WebDriverWait(driver, 10).until(
        EC.presence_of_element_located((By.ID, "myDynamicElement"))
    )
finally:
    driver.quit()
```

In the code above, Selenium will wait for a maximum of 10 seconds for an element matching the given criteria to be found. If no element is found in that time, a TimeoutException is thrown. By default, WebDriverWait calls the ExpectedCondition every 500 milliseconds until it returns success. ExpectedCondition will return *true* (Boolean) in case of success or *not null* if it fails to locate an element.

**Expected Conditions**

There are some common conditions that are frequently of use when automating web browsers. Listed below are the names of each. Selenium Python binding provides some convenience methods so you don't have to code an expected_condition class yourself or create your own utility package for them.

- title_is
- title_contains
- presence_of_element_located
- visibility_of_element_located
- visibility_of
- presence_of_all_elements_located
- text_to_be_present_in_element
- text_to_be_present_in_element_value
- frame_to_be_available_and_switch_to_it
- invisibility_of_element_located
- element_to_be_clickable
- staleness_of
- element_to_be_selected
- element_located_to_be_selected
- element_selection_state_to_be
- element_located_selection_state_to_be
- alert_is_present

```
from selenium.webdriver.support import expected_conditions as EC

wait = WebDriverWait(driver, 10)
element = wait.until(EC.element_to_be_clickable((By.ID, 'someid')))
```

The expected_conditions module contains a set of predefined conditions to use with WebDriverWait.

**Custom Wait Conditions**

You can also create custom wait conditions when none of the previous convenience methods fit your requirements. A custom wait condition can be created using a class with *__call__* method which returns *False* when the condition doesn't match.

```
class element_has_css_class(object):
  """An expectation for checking that an element has a particular css class.

  locator - used to find the element
  returns the WebElement once it has the particular css class
  """
  def __init__(self, locator, css_class):
```

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```
    self.locator = locator
    self.css_class = css_class

  def __call__(self, driver):
    element = driver.find_element(*self.locator)    # Finding the referenced element
    if self.css_class in element.get_attribute("class"):
        return element
    else:
        return False

# Wait until an element with id='myNewInput' has class 'myCSSClass'
wait = WebDriverWait(driver, 10)
element = wait.until(element_has_css_class((By.ID, 'myNewInput'), "myCSSClass"))
```

**Note: polling2 Library**

You may also consider using polling2 library which you need to install separately.

## 5.2 Implicit Waits

An implicit wait tells WebDriver to poll the DOM for a certain amount of time when trying to find any element (or elements) not immediately available. The default setting is 0 (zero). Once set, the implicit wait is set for the life of the WebDriver object.

```
from selenium import webdriver

driver = webdriver.Firefox()
driver.implicitly_wait(10) # seconds
driver.get("http://somedomain/url_that_delays_loading")
myDynamicElement = driver.find_element_by_id("myDynamicElement")
```

CHAPTER 6

# Page Objects

This chapter is a tutorial introduction to the Page Objects design pattern. A page object represents an area where the test interacts within the web application user interface.

Benefits of using page object pattern:

- Easy to read test cases
- Creating reusable code that can share across multiple test cases
- Reducing the amount of duplicated code
- If the user interface changes, the fix needs changes in only one place

## 6.1 Test case

Here is a test case that searches for a word on the *python.org* website and ensures some results. The following section will introduce the *page* module where the page objects will be defined.

```
import unittest
from selenium import webdriver
import page

class PythonOrgSearch(unittest.TestCase):
    """A sample test class to show how page object works"""

    def setUp(self):
        self.driver = webdriver.Firefox()
        self.driver.get("http://www.python.org")

    def test_search_in_python_org(self):
        """Tests python.org search feature. Searches for the word "pycon" then
        verified that some results show up.  Note that it does not look for
        any particular text in search results page. This test verifies that
        the results were not empty."""
```

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```
        #Load the main page. In this case the home page of Python.org.
        main_page = page.MainPage(self.driver)
        #Checks if the word "Python" is in title
        assert main_page.is_title_matches(), "python.org title doesn't match."
        #Sets the text of search textbox to "pycon"
        main_page.search_text_element = "pycon"
        main_page.click_go_button()
        search_results_page = page.SearchResultsPage(self.driver)
        #Verifies that the results page is not empty
        assert search_results_page.is_results_found(), "No results found."

    def tearDown(self):
        self.driver.close()

if __name__ == "__main__":
    unittest.main()
```

## 6.2 Page object classes

The page object pattern intends to create an object for each part of a web page. This technique helps build a separation between the test code and the actual code that interacts with the web page.

The `page.py` will look like this:

```
from element import BasePageElement
from locators import MainPageLocators

class SearchTextElement(BasePageElement):
    """This class gets the search text from the specified locator"""

    #The locator for search box where search string is entered
    locator = 'q'


class BasePage(object):
    """Base class to initialize the base page that will be called from all
    pages"""

    def __init__(self, driver):
        self.driver = driver


class MainPage(BasePage):
    """Home page action methods come here. I.e. Python.org"""

    #Declares a variable that will contain the retrieved text
    search_text_element = SearchTextElement()

    def is_title_matches(self):
        """Verifies that the hardcoded text "Python" appears in page title"""

        return "Python" in self.driver.title
```

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```
    def click_go_button(self):
        """Triggers the search"""

        element = self.driver.find_element(*MainPageLocators.GO_BUTTON)
        element.click()


class SearchResultsPage(BasePage):
    """Search results page action methods come here"""

    def is_results_found(self):
        # Probably should search for this text in the specific page
        # element, but as for now it works fine
        return "No results found." not in self.driver.page_source
```

## 6.3 Page elements

The `element.py` will look like this:

```
from selenium.webdriver.support.ui import WebDriverWait


class BasePageElement(object):
    """Base page class that is initialized on every page object class."""

    def __set__(self, obj, value):
        """Sets the text to the value supplied"""

        driver = obj.driver
        WebDriverWait(driver, 100).until(
            lambda driver: driver.find_element_by_name(self.locator))
        driver.find_element_by_name(self.locator).clear()
        driver.find_element_by_name(self.locator).send_keys(value)

    def __get__(self, obj, owner):
        """Gets the text of the specified object"""

        driver = obj.driver
        WebDriverWait(driver, 100).until(
            lambda driver: driver.find_element_by_name(self.locator))
        element = driver.find_element_by_name(self.locator)
        return element.get_attribute("value")
```

## 6.4 Locators

One of the practices is to separate the locator strings from the place where they are getting used. In this example, locators of the same page belong to the same class.

The `locators.py` will look like this:

```
from selenium.webdriver.common.by import By
```

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```
class MainPageLocators(object):
    """A class for main page locators. All main page locators should come here"""

    GO_BUTTON = (By.ID, 'submit')

class SearchResultsPageLocators(object):
    """A class for search results locators. All search results locators should
    come here"""

    pass
```

CHAPTER 7

# WebDriver API

**Note:** This is not an official documentation. Official API documentation is available here.

This chapter covers all the interfaces of Selenium WebDriver.

**Recommended Import Style**

The API definitions in this chapter show the absolute location of classes. However, the recommended import style is as given below:

```
from selenium import webdriver
```

Then, you can access the classes like this:

```
webdriver.Firefox
webdriver.FirefoxProfile
webdriver.Chrome
webdriver.ChromeOptions
webdriver.Ie
webdriver.Opera
webdriver.PhantomJS
webdriver.Remote
webdriver.DesiredCapabilities
webdriver.ActionChains
webdriver.TouchActions
webdriver.Proxy
```

The special keys class (`Keys`) can be imported like this:

```
from selenium.webdriver.common.keys import Keys
```

The exception classes can be imported like this (Replace the `TheNameOfTheExceptionClass` with the actual class name given below):

```
from selenium.common.exceptions import [TheNameOfTheExceptionClass]
```

**Conventions used in the API**

Some attributes are callable (or methods) and others are non-callable (properties). All the callable attributes are ending with round brackets.

Here is an example for property:

- current_url

  URL of the currently loaded page.

  Usage:

```
driver.current_url
```

Here is an example of a method:

- close()

  Closes the current window.

  Usage:

```
driver.close()
```

## 7.1 Exceptions

Exceptions that may happen in all the webdriver code.

**exception** selenium.common.exceptions.**ElementClickInterceptedException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

The Element Click command could not be completed because the element receiving the events is obscuring the element that was requested clicked.

**exception** selenium.common.exceptions.**ElementNotInteractableException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.InvalidElementStateException*

Thrown when an element is present in the DOM but interactions with that element will hit another element do to paint order

**exception** selenium.common.exceptions.**ElementNotSelectableException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.InvalidElementStateException*

Thrown when trying to select an unselectable element.

For example, selecting a 'script' element.

**exception** selenium.common.exceptions.**ElementNotVisibleException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.InvalidElementStateException*

Thrown when an element is present on the DOM, but it is not visible, and so is not able to be interacted with.

Most commonly encountered when trying to click or read text of an element that is hidden from view.

**exception** selenium.common.exceptions.**ErrorInResponseException**(*response*, *msg*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when an error has occurred on the server side.

This may happen when communicating with the firefox extension or the remote driver server.

**__init__**(*response*, *msg*)

Initialize self. See help(type(self)) for accurate signature.

**exception** selenium.common.exceptions.**ImeActivationFailedException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when activating an IME engine has failed.

**exception** selenium.common.exceptions.**ImeNotAvailableException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when IME support is not available. This exception is thrown for every IME-related method call if IME support is not available on the machine.

**exception** selenium.common.exceptions.**InsecureCertificateException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Navigation caused the user agent to hit a certificate warning, which is usually the result of an expired or invalid TLS certificate.

**exception** selenium.common.exceptions.**InvalidArgumentException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

The arguments passed to a command are either invalid or malformed.

**exception** selenium.common.exceptions.**InvalidCookieDomainException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when attempting to add a cookie under a different domain than the current URL.

**exception** selenium.common.exceptions.**InvalidCoordinatesException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

The coordinates provided to an interactions operation are invalid.

**exception** selenium.common.exceptions.**InvalidElementStateException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when a command could not be completed because the element is in an invalid state.

This can be caused by attempting to clear an element that isn't both editable and resettable.

**exception** selenium.common.exceptions.**InvalidSelectorException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.NoSuchElementException*

Thrown when the selector which is used to find an element does not return a WebElement. Currently this only happens when the selector is an xpath expression and it is either syntactically invalid (i.e. it is not a xpath expression) or the expression does not select WebElements (e.g. "count(//input)").

**exception** selenium.common.exceptions.**InvalidSessionIdException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Occurs if the given session id is not in the list of active sessions, meaning the session either does not exist or that it's not active.

**exception** selenium.common.exceptions.**InvalidSwitchToTargetException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when frame or window target to be switched doesn't exist.

**exception** selenium.common.exceptions.**JavascriptException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

An error occurred while executing JavaScript supplied by the user.

**exception** selenium.common.exceptions.**MoveTargetOutOfBoundsException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when the target provided to the *ActionsChains* move() method is invalid, i.e. out of document.

**exception** selenium.common.exceptions.**NoAlertPresentException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when switching to no presented alert.

This can be caused by calling an operation on the Alert() class when an alert is not yet on the screen.

**exception** selenium.common.exceptions.**NoSuchAttributeException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when the attribute of element could not be found.

You may want to check if the attribute exists in the particular browser you are testing against. Some browsers may have different property names for the same property. (IE8's .innerText vs. Firefox .textContent)

**exception** selenium.common.exceptions.**NoSuchCookieException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

No cookie matching the given path name was found amongst the associated cookies of the current browsing context's active document.

**exception** selenium.common.exceptions.**NoSuchElementException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when element could not be found.

**If you encounter this exception, you may want to check the following:**

- Check your selector used in your find_by...
- Element may not yet be on the screen at the time of the find operation, (webpage is still loading) see selenium.webdriver.support.wait.WebDriverWait() for how to write a wait wrapper to wait for an element to appear.

**exception** selenium.common.exceptions.**NoSuchFrameException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.InvalidSwitchToTargetException*

Thrown when frame target to be switched doesn't exist.

**exception** selenium.common.exceptions.**NoSuchWindowException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.InvalidSwitchToTargetException*

Thrown when window target to be switched doesn't exist.

To find the current set of active window handles, you can get a list of the active window handles in the following way:

```
print driver.window_handles
```

**exception** selenium.common.exceptions.**RemoteDriverServerException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

**exception** selenium.common.exceptions.**ScreenshotException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

A screen capture was made impossible.

**exception** selenium.common.exceptions.**SessionNotCreatedException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

A new session could not be created.

**exception** selenium.common.exceptions.**StaleElementReferenceException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when a reference to an element is now "stale".

Stale means the element no longer appears on the DOM of the page.

**Possible causes of StaleElementReferenceException include, but not limited to:**

- You are no longer on the same page, or the page may have refreshed since the element was located.
- The element may have been removed and re-added to the screen, since it was located. Such as an element being relocated. This can happen typically with a javascript framework when values are updated and the node is rebuilt.
- Element may have been inside an iframe or another context which was refreshed.

**exception** selenium.common.exceptions.**TimeoutException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when a command does not complete in enough time.

**exception** selenium.common.exceptions.**UnableToSetCookieException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when a driver fails to set a cookie.

**exception** selenium.common.exceptions.**UnexpectedAlertPresentException**(*msg=None*, *screen=None*, *stacktrace=None*, *alert_text=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when an unexpected alert is appeared.

Usually raised when when an expected modal is blocking webdriver form executing any more commands.

**__init__**(*msg=None*, *screen=None*, *stacktrace=None*, *alert_text=None*)
Initialize self. See help(type(self)) for accurate signature.

**exception** selenium.common.exceptions.**UnexpectedTagNameException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

Thrown when a support class did not get an expected web element.

**exception** selenium.common.exceptions.**UnknownMethodException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: *selenium.common.exceptions.WebDriverException*

The requested command matched a known URL but did not match an method for that URL.

**exception** selenium.common.exceptions.**WebDriverException**(*msg=None*, *screen=None*, *stacktrace=None*)

Bases: Exception

Base webdriver exception.

**__init__**(*msg=None*, *screen=None*, *stacktrace=None*)

Initialize self. See help(type(self)) for accurate signature.

## 7.2 Action Chains

The ActionChains implementation,

**class** selenium.webdriver.common.action_chains.**ActionChains**(*driver*)

Bases: object

ActionChains are a way to automate low level interactions such as mouse movements, mouse button actions, key press, and context menu interactions. This is useful for doing more complex actions like hover over and drag and drop.

**Generate user actions.** When you call methods for actions on the ActionChains object, the actions are stored in a queue in the ActionChains object. When you call perform(), the events are fired in the order they are queued up.

ActionChains can be used in a chain pattern:

```
menu = driver.find_element_by_css_selector(".nav")
hidden_submenu = driver.find_element_by_css_selector(".nav #submenu1")

ActionChains(driver).move_to_element(menu).click(hidden_submenu).perform()
```

Or actions can be queued up one by one, then performed.:

```
menu = driver.find_element_by_css_selector(".nav")
hidden_submenu = driver.find_element_by_css_selector(".nav #submenu1")

actions = ActionChains(driver)
actions.move_to_element(menu)
actions.click(hidden_submenu)
actions.perform()
```

Either way, the actions are performed in the order they are called, one after another.

**__init__**(*driver*)

Creates a new ActionChains.

**Args**

- driver: The WebDriver instance which performs user actions.

**click**(*on_element=None*)
Clicks an element.

**Args**

- on_element: The element to click. If None, clicks on current mouse position.

**click_and_hold**(*on_element=None*)
Holds down the left mouse button on an element.

**Args**

- on_element: The element to mouse down. If None, clicks on current mouse position.

**context_click**(*on_element=None*)
Performs a context-click (right click) on an element.

**Args**

- on_element: The element to context-click. If None, clicks on current mouse position.

**double_click**(*on_element=None*)
Double-clicks an element.

**Args**

- on_element: The element to double-click. If None, clicks on current mouse position.

**drag_and_drop**(*source*, *target*)

**Holds down the left mouse button on the source element,** then moves to the target element and releases the mouse button.

**Args**

- source: The element to mouse down.
- target: The element to mouse up.

**drag_and_drop_by_offset**(*source*, *xoffset*, *yoffset*)

**Holds down the left mouse button on the source element,** then moves to the target offset and releases the mouse button.

**Args**

- source: The element to mouse down.
- xoffset: X offset to move to.
- yoffset: Y offset to move to.

**key_down**(*value*, *element=None*)

**Sends a key press only, without releasing it.** Should only be used with modifier keys (Control, Alt and Shift).

**Args**

- value: The modifier key to send. Values are defined in *Keys* class.
- element: The element to send keys. If None, sends a key to current focused element.

Example, pressing ctrl+c:

```
ActionChains(driver).key_down(Keys.CONTROL).send_keys('c').key_up(Keys.
↪CONTROL).perform()
```

**key_up**(*value*, *element=None*)
Releases a modifier key.

**Args**

- value: The modifier key to send. Values are defined in Keys class.
- element: The element to send keys. If None, sends a key to current focused element.

Example, pressing ctrl+c:

```
ActionChains(driver).key_down(Keys.CONTROL).send_keys('c').key_up(Keys.
↪CONTROL).perform()
```

**move_by_offset**(*xoffset*, *yoffset*)
Moving the mouse to an offset from current mouse position.

**Args**

- xoffset: X offset to move to, as a positive or negative integer.
- yoffset: Y offset to move to, as a positive or negative integer.

**move_to_element**(*to_element*)
Moving the mouse to the middle of an element.

**Args**

- to_element: The WebElement to move to.

**move_to_element_with_offset**(*to_element*, *xoffset*, *yoffset*)

**Move the mouse by an offset of the specified element.** Offsets are relative to the top-left corner of the element.

**Args**

- to_element: The WebElement to move to.
- xoffset: X offset to move to.
- yoffset: Y offset to move to.

**pause**(*seconds*)
Pause all inputs for the specified duration in seconds

**perform**()
Performs all stored actions.

**release**(*on_element=None*)
Releasing a held mouse button on an element.

**Args**

- on_element: The element to mouse up. If None, releases on current mouse position.

**reset_actions**()
Clears actions that are already stored locally and on the remote end

**send_keys**(**keys_to_send*)
Sends keys to current focused element.

**Args**

- keys_to_send: The keys to send. Modifier keys constants can be found in the 'Keys' class.

**send_keys_to_element**(*element*, **keys_to_send*)
Sends keys to an element.

**Args**

- element: The element to send keys.
- keys_to_send: The keys to send. Modifier keys constants can be found in the 'Keys' class.

## 7.3 Alerts

The Alert implementation.

**class** selenium.webdriver.common.alert.**Alert**(*driver*)
Bases: object

Allows to work with alerts.

Use this class to interact with alert prompts. It contains methods for dismissing, accepting, inputting, and getting text from alert prompts.

Accepting / Dismissing alert prompts:

```
Alert(driver).accept()
Alert(driver).dismiss()
```

Inputting a value into an alert prompt:

name_prompt = Alert(driver) name_prompt.send_keys("Willian Shakesphere") name_prompt.accept()

Reading a the text of a prompt for verification:

alert_text = Alert(driver).text self.assertEqual("Do you wish to quit?", alert_text)

**__init__**(*driver*)
Creates a new Alert.

**Args**

- driver: The WebDriver instance which performs user actions.

**accept**()
Accepts the alert available.

Usage:: Alert(driver).accept() # Confirm a alert dialog.

**dismiss**()
Dismisses the alert available.

**send_keys**(*keysToSend*)
Send Keys to the Alert.

**Args**

- keysToSend: The text to be sent to Alert.

**text**
Gets the text of the Alert.

## 7.4 Special Keys

The Keys implementation.

**class** selenium.webdriver.common.keys.**Keys**
Bases: object

Set of special keys codes.

**ADD = '\ue025'**

**ALT = '\ue00a'**

**ARROW_DOWN = '\ue015'**

**ARROW_LEFT = '\ue012'**

**ARROW_RIGHT = '\ue014'**

**ARROW_UP = '\ue013'**

**BACKSPACE = '\ue003'**

**BACK_SPACE = '\ue003'**

**CANCEL = '\ue001'**

**CLEAR = '\ue005'**

**COMMAND = '\ue03d'**

**CONTROL = '\ue009'**

**DECIMAL = '\ue028'**

**DELETE = '\ue017'**

**DIVIDE = '\ue029'**

**DOWN = '\ue015'**

**END = '\ue010'**

**ENTER = '\ue007'**

**EQUALS = '\ue019'**

**ESCAPE = '\ue00c'**

**F1 = '\ue031'**

**F10 = '\ue03a'**

**F11 = '\ue03b'**

**F12 = '\ue03c'**

**F2 = '\ue032'**

**F3 = '\ue033'**

**F4 = '\ue034'**

**F5 = '\ue035'**

```
F6 = '\ue036'
F7 = '\ue037'
F8 = '\ue038'
F9 = '\ue039'
HELP = '\ue002'
HOME = '\ue011'
INSERT = '\ue016'
LEFT = '\ue012'
LEFT_ALT = '\ue00a'
LEFT_CONTROL = '\ue009'
LEFT_SHIFT = '\ue008'
META = '\ue03d'
MULTIPLY = '\ue024'
NULL = '\ue000'
NUMPAD0 = '\ue01a'
NUMPAD1 = '\ue01b'
NUMPAD2 = '\ue01c'
NUMPAD3 = '\ue01d'
NUMPAD4 = '\ue01e'
NUMPAD5 = '\ue01f'
NUMPAD6 = '\ue020'
NUMPAD7 = '\ue021'
NUMPAD8 = '\ue022'
NUMPAD9 = '\ue023'
PAGE_DOWN = '\ue00f'
PAGE_UP = '\ue00e'
PAUSE = '\ue00b'
RETURN = '\ue006'
RIGHT = '\ue014'
SEMICOLON = '\ue018'
SEPARATOR = '\ue026'
SHIFT = '\ue008'
SPACE = '\ue00d'
SUBTRACT = '\ue027'
TAB = '\ue004'
UP = '\ue013'
```

## 7.5 Locate elements By

These are the attributes which can be used to locate elements. See the *Locating Elements* chapter for example usages.

The By implementation.

**class** selenium.webdriver.common.by.**By**
Bases: object

Set of supported locator strategies.

**CLASS_NAME = 'class name'**

**CSS_SELECTOR = 'css selector'**

**ID = 'id'**

**LINK_TEXT = 'link text'**

**NAME = 'name'**

**PARTIAL_LINK_TEXT = 'partial link text'**

**TAG_NAME = 'tag name'**

**XPATH = 'xpath'**

## 7.6 Desired Capabilities

See the *Using Selenium with remote WebDriver* section for example usages of desired capabilities.

The Desired Capabilities implementation.

**class** selenium.webdriver.common.desired_capabilities.**DesiredCapabilities**
Bases: object

Set of default supported desired capabilities.

Use this as a starting point for creating a desired capabilities object for requesting remote webdrivers for connecting to selenium server or selenium grid.

Usage Example:

```
from selenium import webdriver

selenium_grid_url = "http://198.0.0.1:4444/wd/hub"

# Create a desired capabilities object as a starting point.
capabilities = DesiredCapabilities.FIREFOX.copy()
capabilities['platform'] = "WINDOWS"
capabilities['version'] = "10"

# Instantiate an instance of Remote WebDriver with the desired capabilities.
driver = webdriver.Remote(desired_capabilities=capabilities,
                          command_executor=selenium_grid_url)
```

Note: Always use '.copy()' on the DesiredCapabilities object to avoid the side effects of altering the Global class instance.

**ANDROID = {'browserName': 'android', 'platform': 'ANDROID', 'version': ''}**

**CHROME = {'browserName': 'chrome', 'platform': 'ANY', 'version': ''}**

```
EDGE = {'browserName': 'MicrosoftEdge', 'platform': 'WINDOWS', 'version': ''}
FIREFOX = {'acceptInsecureCerts': True, 'browserName': 'firefox', 'marionette': Tru
HTMLUNIT = {'browserName': 'htmlunit', 'platform': 'ANY', 'version': ''}
HTMLUNITWITHJS = {'browserName': 'htmlunit', 'javascriptEnabled': True, 'platform':
INTERNETEXPLORER = {'browserName': 'internet explorer', 'platform': 'WINDOWS', 'vers
IPAD = {'browserName': 'iPad', 'platform': 'MAC', 'version': ''}
IPHONE = {'browserName': 'iPhone', 'platform': 'MAC', 'version': ''}
OPERA = {'browserName': 'opera', 'platform': 'ANY', 'version': ''}
PHANTOMJS = {'browserName': 'phantomjs', 'javascriptEnabled': True, 'platform': 'AN
SAFARI = {'browserName': 'safari', 'platform': 'MAC', 'version': ''}
WEBKITGTK = {'browserName': 'MiniBrowser', 'platform': 'ANY', 'version': ''}
```

## 7.7 Touch Actions

The Touch Actions implementation

**class** selenium.webdriver.common.touch_actions.**TouchActions**(*driver*)
Bases: object

Generate touch actions. Works like ActionChains; actions are stored in the TouchActions object and are fired with perform().

**__init__**(*driver*)
Creates a new TouchActions object.

**Args**

- driver: The WebDriver instance which performs user actions. It should be with touch-screen enabled.

**double_tap**(*on_element*)
Double taps on a given element.

**Args**

- on_element: The element to tap.

**flick**(*xspeed*, *yspeed*)
Flicks, starting anywhere on the screen.

**Args**

- xspeed: The X speed in pixels per second.
- yspeed: The Y speed in pixels per second.

**flick_element**(*on_element*, *xoffset*, *yoffset*, *speed*)
Flick starting at on_element, and moving by the xoffset and yoffset with specified speed.

**Args**

- on_element: Flick will start at center of element.
- xoffset: X offset to flick to.
- yoffset: Y offset to flick to.

- speed: Pixels per second to flick.

**long_press**(*on_element*)
Long press on an element.

**Args**

- on_element: The element to long press.

**move**(*xcoord*, *ycoord*)
Move held tap to specified location.

**Args**

- xcoord: X Coordinate to move.
- ycoord: Y Coordinate to move.

**perform**()
Performs all stored actions.

**release**(*xcoord*, *ycoord*)
Release previously issued tap 'and hold' command at specified location.

**Args**

- xcoord: X Coordinate to release.
- ycoord: Y Coordinate to release.

**scroll**(*xoffset*, *yoffset*)
Touch and scroll, moving by xoffset and yoffset.

**Args**

- xoffset: X offset to scroll to.
- yoffset: Y offset to scroll to.

**scroll_from_element**(*on_element*, *xoffset*, *yoffset*)
Touch and scroll starting at on_element, moving by xoffset and yoffset.

**Args**

- on_element: The element where scroll starts.
- xoffset: X offset to scroll to.
- yoffset: Y offset to scroll to.

**tap**(*on_element*)
Taps on a given element.

**Args**

- on_element: The element to tap.

**tap_and_hold**(*xcoord*, *ycoord*)
Touch down at given coordinates.

**Args**

- xcoord: X Coordinate to touch down.
- ycoord: Y Coordinate to touch down.

## 7.8 Proxy

The Proxy implementation.

**class** selenium.webdriver.common.proxy.**Proxy**(*raw=None*)
Bases: object

Proxy contains information about proxy type and necessary proxy settings.

**__init__**(*raw=None*)
Creates a new Proxy.

**Args**

- raw: raw proxy data. If None, default class values are used.

**add_to_capabilities**(*capabilities*)
Adds proxy information as capability in specified capabilities.

**Args**

- capabilities: The capabilities to which proxy will be added.

**auto_detect**
Returns autodetect setting.

**autodetect = False**

**ftpProxy = ''**

**ftp_proxy**
Returns ftp proxy setting.

**httpProxy = ''**

**http_proxy**
Returns http proxy setting.

**noProxy = ''**

**no_proxy**
Returns noproxy setting.

**proxyAutoconfigUrl = ''**

**proxyType = {'ff_value': 6, 'string': 'UNSPECIFIED'}**

**proxy_autoconfig_url**
Returns proxy autoconfig url setting.

**proxy_type**
Returns proxy type as *ProxyType*.

**socksPassword = ''**

**socksProxy = ''**

**socksUsername = ''**

**socks_password**
Returns socks proxy password setting.

**socks_proxy**
Returns socks proxy setting.

**socks_username**
Returns socks proxy username setting.

**sslProxy = ''**

**ssl_proxy**
Returns https proxy setting.

**class** selenium.webdriver.common.proxy.**ProxyType**
Bases: object

Set of possible types of proxy.

**Each proxy type has 2 properties:** 'ff_value' is value of Firefox profile preference, 'string' is id of proxy type.

**classmethod load**(*value*)

**AUTODETECT = {'ff_value': 4, 'string': 'AUTODETECT'}**

**DIRECT = {'ff_value': 0, 'string': 'DIRECT'}**

**MANUAL = {'ff_value': 1, 'string': 'MANUAL'}**

**PAC = {'ff_value': 2, 'string': 'PAC'}**

**RESERVED_1 = {'ff_value': 3, 'string': 'RESERVED1'}**

**SYSTEM = {'ff_value': 5, 'string': 'SYSTEM'}**

**UNSPECIFIED = {'ff_value': 6, 'string': 'UNSPECIFIED'}**

**class** selenium.webdriver.common.proxy.**ProxyTypeFactory**
Bases: object

Factory for proxy types.

**static make**(*ff_value*, *string*)

## 7.9 Utilities

The Utils methods.

selenium.webdriver.common.utils.**find_connectable_ip**(*host*, *port=None*)
Resolve a hostname to an IP, preferring IPv4 addresses.

We prefer IPv4 so that we don't change behavior from previous IPv4-only implementations, and because some drivers (e.g., FirefoxDriver) do not support IPv6 connections.

If the optional port number is provided, only IPs that listen on the given port are considered.

**Args**

- host - A hostname.
- port - Optional port number.

**Returns** A single IP address, as a string. If any IPv4 address is found, one is returned. Otherwise, if any IPv6 address is found, one is returned. If neither, then None is returned.

selenium.webdriver.common.utils.**free_port**()
Determines a free port using sockets.

selenium.webdriver.common.utils.**is_connectable**(*port*, *host='localhost'*)
Tries to connect to the server at port to see if it is running.

**Args**

- port - The port to connect.

selenium.webdriver.common.utils.**is_url_connectable**(*port*)
Tries to connect to the HTTP server at /status path and specified port to see if it responds successfully.

**Args**

- port - The port to connect.

selenium.webdriver.common.utils.**join_host_port**(*host*, *port*)
Joins a hostname and port together.

This is a minimal implementation intended to cope with IPv6 literals. For example, _join_host_port('::1', 80) == '[::1]:80'.

**Args**

- host - A hostname.
- port - An integer port.

selenium.webdriver.common.utils.**keys_to_typing**(*value*)
Processes the values that will be typed in the element.

## 7.10 Service

**class** selenium.webdriver.common.service.**Service**(*executable*, *port=0*, *log_file=-3*, *env=None*, *start_error_message=""*)
Bases: object

**__init__**(*executable*, *port=0*, *log_file=-3*, *env=None*, *start_error_message=""*)
Initialize self. See help(type(self)) for accurate signature.

**assert_process_still_running**()

**command_line_args**()

**is_connectable**()

**send_remote_shutdown_command**()

**start**()
Starts the Service.

**Exceptions**

- WebDriverException : Raised either when it can't start the service or when it can't connect to the service

**stop**()
Stops the service.

**service_url**
Gets the url of the Service

## 7.11 Application Cache

The ApplicationCache implementaion.

**class** selenium.webdriver.common.html5.application_cache.**ApplicationCache**(*driver*)
Bases: object

**__init__**(*driver*)
Creates a new Aplication Cache.

**Args**

- driver: The WebDriver instance which performs user actions.

**CHECKING = 2**

**DOWNLOADING = 3**

**IDLE = 1**

**OBSOLETE = 5**

**UNCACHED = 0**

**UPDATE_READY = 4**

**status**
Returns a current status of application cache.

## 7.12 Firefox WebDriver

**class** selenium.webdriver.firefox.webdriver.**WebDriver**(*firefox_profile=None*, *firefox_binary=None*, *timeout=30*, *capabilities=None*, *proxy=None*, *executable_path='geckodriver'*, *options=None*, *service_log_path='geckodriver.log'*, *firefox_options=None*, *service_args=None*, *desired_capabilities=None*, *log_path=None*, *keep_alive=True*)
Bases: *selenium.webdriver.remote.webdriver.WebDriver*

**__init__**(*firefox_profile=None*, *firefox_binary=None*, *timeout=30*, *capabilities=None*, *proxy=None*, *executable_path='geckodriver'*, *options=None*, *service_log_path='geckodriver.log'*, *firefox_options=None*, *service_args=None*, *desired_capabilities=None*, *log_path=None*, *keep_alive=True*)
Starts a new local session of Firefox.

Based on the combination and specificity of the various keyword arguments, a capabilities dictionary will be constructed that is passed to the remote end.

The keyword arguments given to this constructor are helpers to more easily allow Firefox WebDriver sessions to be customised with different options. They are mapped on to a capabilities dictionary that is passed on to the remote end.

As some of the options, such as *firefox_profile* and *options.profile* are mutually exclusive, precedence is given from how specific the setting is. *capabilities* is the least specific keyword argument, followed by *options*, followed by *firefox_binary* and *firefox_profile*.

In practice this means that if *firefox_profile* and *options.profile* are both set, the selected profile instance will always come from the most specific variable. In this case that would be *firefox_profile*. This will result in

*options.profile* to be ignored because it is considered a less specific setting than the top-level *firefox_profile* keyword argument. Similarily, if you had specified a *capabilities["moz:firefoxOptions"]["profile"]* Base64 string, this would rank below *options.profile*.

**Parameters**

- **firefox_profile** – Instance of `FirefoxProfile` object or a string. If undefined, a fresh profile will be created in a temporary location on the system.
- **firefox_binary** – Instance of `FirefoxBinary` or full path to the Firefox binary. If undefined, the system default Firefox installation will be used.
- **timeout** – Time to wait for Firefox to launch when using the extension connection.
- **capabilities** – Dictionary of desired capabilities.
- **proxy** – The proxy settings to us when communicating with Firefox via the extension connection.
- **executable_path** – Full path to override which geckodriver binary to use for Firefox 47.0.1 and greater, which defaults to picking up the binary from the system path.
- **options** – Instance of `options.Options`.
- **service_log_path** – Where to log information from the driver.
- **firefox_options** – Deprecated argument for options
- **service_args** – List of args to pass to the driver service
- **desired_capabilities** – alias of capabilities. In future versions of this library, this will replace 'capabilities'. This will make the signature consistent with RemoteWebDriver.
- **log_path** – Deprecated argument for service_log_path
- **keep_alive** – Whether to configure remote_connection.RemoteConnection to use HTTP keep-alive.

**context**(*context*)

Sets the context that Selenium commands are running in using a *with* statement. The state of the context on the server is saved before entering the block, and restored upon exiting it.

**Parameters** **context** – Context, may be one of the class properties *CONTEXT_CHROME* or *CONTEXT_CONTENT*.

Usage example:

```
with selenium.context(selenium.CONTEXT_CHROME):
    # chrome scope
    ... do stuff ...
```

**install_addon**(*path*, *temporary=None*)

Installs Firefox addon.

Returns identifier of installed addon. This identifier can later be used to uninstall addon.

**Parameters** **path** – Absolute path to the addon that will be installed.

**Usage** driver.install_addon('/path/to/firebug.xpi')

**quit**()

Quits the driver and close every associated window.

**set_context**(*context*)

**uninstall_addon**(*identifier*)
Uninstalls Firefox addon using its identifier.

**Usage** driver.uninstall_addon('addon@foo.com')

**CONTEXT_CHROME = 'chrome'**

**CONTEXT_CONTENT = 'content'**

**NATIVE_EVENTS_ALLOWED = True**

**firefox_profile**

## 7.13 Firefox WebDriver Options

**class** selenium.webdriver.firefox.options.**Log**
Bases: object

**__init__**()
Initialize self. See help(type(self)) for accurate signature.

**to_capabilities**()

**class** selenium.webdriver.firefox.options.**Options**
Bases: object

**__init__**()
Initialize self. See help(type(self)) for accurate signature.

**add_argument**(*argument*)
Add argument to be used for the browser process.

**set_capability**(*name*, *value*)
Sets a capability.

**set_headless**(*headless=True*)
Deprecated, options.headless = True

**set_preference**(*name*, *value*)
Sets a preference.

**to_capabilities**()
Marshals the Firefox options to a *moz:firefoxOptions* object.

**KEY = 'moz:firefoxOptions'**

**accept_insecure_certs**

**arguments**
Returns a list of browser process arguments.

**binary**
Returns the FirefoxBinary instance

**binary_location**
Returns the location of the binary.

**capabilities**

**headless**
Returns whether or not the headless argument is set

**preferences**
Returns a dict of preferences.

**profile**
Returns the Firefox profile to use.

**proxy**
returns Proxy if set otherwise None.

## 7.14 Firefox WebDriver Profile

**exception** selenium.webdriver.firefox.firefox_profile.**AddonFormatError**
Bases: Exception

Exception for not well-formed add-on manifest files

**class** selenium.webdriver.firefox.firefox_profile.**FirefoxProfile**(*profile_directory=None*)
Bases: object

**__init__**(*profile_directory=None*)
Initialises a new instance of a Firefox Profile

**Args**

- profile_directory: Directory of profile that you want to use. If a directory is passed in it will be cloned and the cloned directory will be used by the driver when instantiated. This defaults to None and will create a new directory when object is created.

**add_extension**(*extension='webdriver.xpi'*)

**set_preference**(*key*, *value*)
sets the preference that we want in the profile.

**set_proxy**(*proxy*)

**update_preferences**()

**ANONYMOUS_PROFILE_NAME = 'WEBDRIVER_ANONYMOUS_PROFILE'**

**DEFAULT_PREFERENCES = None**

**accept_untrusted_certs**

**assume_untrusted_cert_issuer**

**encoded**
A zipped, base64 encoded string of profile directory for use with remote WebDriver JSON wire protocol

**native_events_enabled**

**path**
Gets the profile directory that is currently being used

**port**
Gets the port that WebDriver is working on

## 7.15 Firefox WebDriver Binary

**class** selenium.webdriver.firefox.firefox_binary.**FirefoxBinary**(*firefox_path=None*, *log_file=None*)

Bases: object

**__init__**(*firefox_path=None*, *log_file=None*)
Creates a new instance of Firefox binary.

**Args**

- firefox_path - Path to the Firefox executable. By default, it will be detected from the standard locations.
- **log_file - A file object to redirect the firefox process output to. It can be sys.stdout.** Please note that with parallel run the output won't be synchronous. By default, it will be redirected to /dev/null.

**add_command_line_options**(**args*)

**kill**()
Kill the browser.

This is useful when the browser is stuck.

**launch_browser**(*profile*, *timeout=30*)
Launches the browser for the given profile name. It is assumed the profile already exists.

**which**(*fname*)
Returns the fully qualified path by searching Path of the given name

**NO_FOCUS_LIBRARY_NAME = 'x_ignore_nofocus.so'**

## 7.16 Firefox WebDriver Extension Connection

**exception** selenium.webdriver.firefox.extension_connection.**ExtensionConnectionError**
Bases: Exception

An internal error occurred int the extension.

Might be caused by bad input or bugs in webdriver

**class** selenium.webdriver.firefox.extension_connection.**ExtensionConnection**(*host*, *firefox_profile*, *firefox_binary=None*, *timeout=30*)

Bases: *selenium.webdriver.remote.remote_connection.RemoteConnection*

**__init__**(*host*, *firefox_profile*, *firefox_binary=None*, *timeout=30*)
Initialize self. See help(type(self)) for accurate signature.

**connect**()
Connects to the extension and retrieves the session id.

**classmethod connect_and_quit**()
Connects to an running browser and quit immediately.

**classmethod is_connectable**()
Trys to connect to the extension but do not retrieve context.

**quit**(*sessionId=None*)

## 7.17 Chrome WebDriver

**class** selenium.webdriver.chrome.webdriver.**WebDriver**(*executable_path='chromedriver'*, *port=0*, *options=None*, *service_args=None*, *desired_capabilities=None*, *service_log_path=None*, *chrome_options=None*, *keep_alive=True*)

Bases: *selenium.webdriver.remote.webdriver.WebDriver*

Controls the ChromeDriver and allows you to drive the browser.

You will need to download the ChromeDriver executable from http://chromedriver.storage.googleapis.com/index.html

**__init__**(*executable_path='chromedriver'*, *port=0*, *options=None*, *service_args=None*, *desired_capabilities=None*, *service_log_path=None*, *chrome_options=None*, *keep_alive=True*)
Creates a new instance of the chrome driver.

Starts the service and then creates new instance of chrome driver.

**Args**

- executable_path - path to the executable. If the default is used it assumes the executable is in the $PATH
- port - port you would like the service to run, if left as 0, a free port will be found.
- options - this takes an instance of ChromeOptions
- service_args - List of args to pass to the driver service
- desired_capabilities - Dictionary object with non-browser specific capabilities only, such as "proxy" or "loggingPref".
- service_log_path - Where to log information from the driver.
- chrome_options - Deprecated argument for options
- keep_alive - Whether to configure ChromeRemoteConnection to use HTTP keep-alive.

**create_options**()

**execute_cdp_cmd**(*cmd*, *cmd_args*)
Execute Chrome Devtools Protocol command and get returned result

The command and command args should follow chrome devtools protocol domains/commands, refer to link https://chromedevtools.github.io/devtools-protocol/

**Args**

- cmd: A str, command name
- cmd_args: A dict, command args. empty dict {} if there is no command args

**Usage** driver.execute_cdp_cmd('Network.getResponseBody', {'requestId': requestId})

**Returns** A dict, empty dict {} if there is no result to return. For example to getResponseBody:

{'base64Encoded': False, 'body': 'response body string'}

**get_network_conditions**()
Gets Chrome network emulation settings.

**Returns** A dict. For example:

{'latency': 4, 'download_throughput': 2, 'upload_throughput': 2, 'offline': False}

**launch_app**(*id*)
Launches Chrome app specified by id.

**quit**()
Closes the browser and shuts down the ChromeDriver executable that is started when starting the ChromeDriver

**set_network_conditions**(***network_conditions*)
Sets Chrome network emulation settings.

**Args**

- network_conditions: A dict with conditions specification.

**Usage**

**driver.set_network_conditions(** offline=False, latency=5, # additional latency (ms) download_throughput=500 * 1024, # maximal throughput upload_throughput=500 * 1024) # maximal throughput

Note: 'throughput' can be used to set both (for download and upload).

## 7.18 Chrome WebDriver Options

**class** selenium.webdriver.chrome.options.**Options**
Bases: object

**__init__**()
Initialize self. See help(type(self)) for accurate signature.

**add_argument**(*argument*)
Adds an argument to the list

**Args**

- Sets the arguments

**add_encoded_extension**(*extension*)
Adds Base64 encoded string with extension data to a list that will be used to extract it to the ChromeDriver

**Args**

- extension: Base64 encoded string with extension data

**add_experimental_option**(*name*, *value*)
Adds an experimental option which is passed to chrome.

**Args:** name: The experimental option name. value: The option value.

**add_extension**(*extension*)
Adds the path to the extension to a list that will be used to extract it to the ChromeDriver

**Args**

- extension: path to the *.crx file

**set_capability**(*name*, *value*)
Sets a capability.

**set_headless**(*headless=True*)
Deprecated, options.headless = True

**to_capabilities**()
Creates a capabilities with all the options that have been set and

returns a dictionary with everything

**KEY = 'goog:chromeOptions'**

**arguments**
Returns a list of arguments needed for the browser

**binary_location**
Returns the location of the binary otherwise an empty string

**capabilities**

**debugger_address**
Returns the address of the remote devtools instance

**experimental_options**
Returns a dictionary of experimental options for chrome.

**extensions**
Returns a list of encoded extensions that will be loaded into chrome

**headless**
Returns whether or not the headless argument is set

## 7.19 Chrome WebDriver Service

**class** selenium.webdriver.chrome.service.**Service**(*executable_path*, *port=0*, *service_args=None*, *log_path=None*, *env=None*)
Bases: *selenium.webdriver.common.service.Service*

Object that manages the starting and stopping of the ChromeDriver

**__init__**(*executable_path*, *port=0*, *service_args=None*, *log_path=None*, *env=None*)
Creates a new instance of the Service

**Args**

- executable_path : Path to the ChromeDriver
- port : Port the service is running on
- service_args : List of args to pass to the chromedriver service
- log_path : Path for the chromedriver service to log to

**command_line_args**()

## 7.20 Remote WebDriver

The WebDriver implementation.

**class** selenium.webdriver.remote.webdriver.**WebDriver**(*command_executor='http://127.0.0.1:4444/wd/hub'*, *desired_capabilities=None*, *browser_profile=None*, *proxy=None*, *keep_alive=False*, *file_detector=None*, *options=None*)

Bases: object

Controls a browser by sending commands to a remote server. This server is expected to be running the WebDriver wire protocol as defined at https://github.com/SeleniumHQ/selenium/wiki/JsonWireProtocol

**Attributes**

- session_id - String ID of the browser session started and controlled by this WebDriver.
- **capabilities - Dictionaty of effective capabilities of this browser session as returned** by the remote server. See https://github.com/SeleniumHQ/selenium/wiki/DesiredCapabilities
- command_executor - remote_connection.RemoteConnection object used to execute commands.
- error_handler - errorhandler.ErrorHandler object used to handle errors.

**__init__**(*command_executor='http://127.0.0.1:4444/wd/hub'*, *desired_capabilities=None*, *browser_profile=None*, *proxy=None*, *keep_alive=False*, *file_detector=None*, *options=None*)

Create a new driver that will issue commands using the wire protocol.

**Args**

- **command_executor - Either a string representing URL of the remote server or a custom** remote_connection.RemoteConnection object. Defaults to 'http://127.0.0.1:4444/wd/hub'.
- **desired_capabilities - A dictionary of capabilities to request when** starting the browser session. Required parameter.
- **browser_profile - A selenium.webdriver.firefox.firefox_profile.FirefoxProfile object.** Only used if Firefox is requested. Optional.
- **proxy - A selenium.webdriver.common.proxy.Proxy object. The browser session will** be started with given proxy settings, if possible. Optional.
- **keep_alive - Whether to configure remote_connection.RemoteConnection to use** HTTP keep-alive. Defaults to False.
- **file_detector - Pass custom file detector object during instantiation. If None,** then default LocalFileDetector() will be used.
- options - instance of a driver options.Options class

**add_cookie**(*cookie_dict*)

Adds a cookie to your current session.

**Args**

- **cookie_dict: A dictionary object, with required keys - "name" and "value";** optional keys - "path", "domain", "secure", "expiry"

**Usage:** driver.add_cookie({'name' : 'foo', 'value' : 'bar'}) driver.add_cookie({'name' : 'foo', 'value' : 'bar', 'path' : '/'}) driver.add_cookie({'name' : 'foo', 'value' : 'bar', 'path' : '/', 'secure':True})

**back**()
Goes one step backward in the browser history.

**Usage** driver.back()

**close**()
Closes the current window.

**Usage** driver.close()

**create_web_element**(*element_id*)
Creates a web element with the specified *element_id*.

**delete_all_cookies**()
Delete all cookies in the scope of the session.

**Usage** driver.delete_all_cookies()

**delete_cookie**(*name*)
Deletes a single cookie with the given name.

**Usage** driver.delete_cookie('my_cookie')

**execute**(*driver_command*, *params=None*)
Sends a command to be executed by a command.CommandExecutor.

**Args**

- driver_command: The name of the command to execute as a string.
- params: A dictionary of named parameters to send with the command.

**Returns** The command's JSON response loaded into a dictionary object.

**execute_async_script**(*script*, **args*)
Asynchronously Executes JavaScript in the current window/frame.

**Args**

- script: The JavaScript to execute.
- *args: Any applicable arguments for your JavaScript.

**Usage** script = "var callback = arguments[arguments.length - 1]; " "window.setTimeout(function(){ callback('timeout') }, 3000);" driver.execute_async_script(script)

**execute_script**(*script*, **args*)
Synchronously Executes JavaScript in the current window/frame.

**Args**

- script: The JavaScript to execute.
- *args: Any applicable arguments for your JavaScript.

**Usage** driver.execute_script('return document.title;')

**file_detector_context**(*file_detector_class*, **args*, ***kwargs*)
Overrides the current file detector (if necessary) in limited context. Ensures the original file detector is set afterwards.

Example:

**with webdriver.file_detector_context(UselessFileDetector):** someinput.send_keys('/etc/hosts')

**Args**

- **file_detector_class - Class of the desired file detector. If the class is different** from the current file_detector, then the class is instantiated with args and kwargs and used as a file detector during the duration of the context manager.
- **args - Optional arguments that get passed to the file detector class during** instantiation.
- kwargs - Keyword arguments, passed the same way as args.

**find_element**(*by='id'*, *value=None*)

Find an element given a By strategy and locator. Prefer the find_element_by_* methods when possible.

**Usage** element = driver.find_element(By.ID, 'foo')

**Return type** *WebElement*

**find_element_by_class_name**(*name*)

Finds an element by class name.

**Args**

- name: The class name of the element to find.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_class_name('foo')

**find_element_by_css_selector**(*css_selector*)

Finds an element by css selector.

**Args**

- css_selector - CSS selector string, ex: 'a.nav#home'

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_css_selector('#foo')

**find_element_by_id**(*id_*)

Finds an element by id.

**Args**

- id_ - The id of the element to be found.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_id('foo')

**find_element_by_link_text** (*link_text*)
Finds an element by link text.

**Args**

- link_text: The text of the element to be found.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_link_text('Sign In')

**find_element_by_name** (*name*)
Finds an element by name.

**Args**

- name: The name of the element to find.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_name('foo')

**find_element_by_partial_link_text** (*link_text*)
Finds an element by a partial match of its link text.

**Args**

- link_text: The text of the element to partially match on.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_partial_link_text('Sign')

**find_element_by_tag_name** (*name*)
Finds an element by tag name.

**Args**

- name - name of html tag (eg: h1, a, span)

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_tag_name('h1')

**find_element_by_xpath**(*xpath*)
Finds an element by xpath.

**Args**

- xpath - The xpath locator of the element to find.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = driver.find_element_by_xpath('//div/td[1]')

**find_elements**(*by='id'*, *value=None*)
Find elements given a By strategy and locator. Prefer the find_elements_by_* methods when possible.

**Usage** elements = driver.find_elements(By.CLASS_NAME, 'foo')

**Return type** list of WebElement

**find_elements_by_class_name**(*name*)
Finds elements by class name.

**Args**

- name: The class name of the elements to find.

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = driver.find_elements_by_class_name('foo')

**find_elements_by_css_selector**(*css_selector*)
Finds elements by css selector.

**Args**

- css_selector - CSS selector string, ex: 'a.nav#home'

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = driver.find_elements_by_css_selector('.foo')

**find_elements_by_id**(*id_*)
Finds multiple elements by id.

**Args**

- id_ - The id of the elements to be found.

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = driver.find_elements_by_id('foo')

**find_elements_by_link_text**(*text*)
Finds elements by link text.

**Args**

- link_text: The text of the elements to be found.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = driver.find_elements_by_link_text('Sign In')

**find_elements_by_name**(*name*)
Finds elements by name.

**Args**

- name: The name of the elements to find.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = driver.find_elements_by_name('foo')

**find_elements_by_partial_link_text**(*link_text*)
Finds elements by a partial match of their link text.

**Args**

- link_text: The text of the element to partial match on.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = driver.find_elements_by_partial_link_text('Sign')

**find_elements_by_tag_name**(*name*)
Finds elements by tag name.

**Args**

- name - name of html tag (eg: h1, a, span)

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = driver.find_elements_by_tag_name('h1')

**find_elements_by_xpath**(*xpath*)
Finds multiple elements by xpath.

**Args**

- xpath - The xpath locator of the elements to be found.

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = driver.find_elements_by_xpath("//div[contains(@class, 'foo')]")

**forward**()
Goes one step forward in the browser history.

**Usage** driver.forward()

**fullscreen_window**()
Invokes the window manager-specific 'full screen' operation

**get**(*url*)
Loads a web page in the current browser session.

**get_cookie**(*name*)
Get a single cookie by name. Returns the cookie if found, None if not.

**Usage** driver.get_cookie('my_cookie')

**get_cookies**()
Returns a set of dictionaries, corresponding to cookies visible in the current session.

**Usage** driver.get_cookies()

**get_log**(*log_type*)
Gets the log for a given log type

**Args**

- log_type: type of log that which will be returned

**Usage** driver.get_log('browser') driver.get_log('driver') driver.get_log('client') driver.get_log('server')

**get_screenshot_as_base64**()

**Gets the screenshot of the current window as a base64 encoded string** which is useful in embedded images in HTML.

**Usage** driver.get_screenshot_as_base64()

**get_screenshot_as_file**(*filename*)

**Saves a screenshot of the current window to a PNG image file. Returns** False if there is any IOError, else returns True. Use full paths in your filename.

**Args**

- filename: The full path you wish to save your screenshot to. This should end with a *.png* extension.

**Usage** driver.get_screenshot_as_file('/Screenshots/foo.png')

**get_screenshot_as_png**()
Gets the screenshot of the current window as a binary data.

**Usage** driver.get_screenshot_as_png()

**get_window_position**(*windowHandle='current'*)
Gets the x,y position of the current window.

**Usage** driver.get_window_position()

**get_window_rect**()
Gets the x, y coordinates of the window as well as height and width of the current window.

**Usage** driver.get_window_rect()

**get_window_size**(*windowHandle='current'*)
Gets the width and height of the current window.

**Usage** driver.get_window_size()

**implicitly_wait**(*time_to_wait*)

**Sets a sticky timeout to implicitly wait for an element to be found,** or a command to complete. This method only needs to be called one time per session. To set the timeout for calls to execute_async_script, see set_script_timeout.

**Args**

- time_to_wait: Amount of time to wait (in seconds)

**Usage** driver.implicitly_wait(30)

**maximize_window**()
Maximizes the current window that webdriver is using

**minimize_window**()
Invokes the window manager-specific 'minimize' operation

**quit**()
Quits the driver and closes every associated window.

**Usage** driver.quit()

**refresh**()
Refreshes the current page.

**Usage** driver.refresh()

**save_screenshot**(*filename*)

**Saves a screenshot of the current window to a PNG image file. Returns** False if there is any IOError, else returns True. Use full paths in your filename.

**Args**

- filename: The full path you wish to save your screenshot to. This should end with a *.png* extension.

**Usage** driver.save_screenshot('/Screenshots/foo.png')

**set_page_load_timeout**(*time_to_wait*)

**Set the amount of time to wait for a page load to complete** before throwing an error.

**Args**

- time_to_wait: The amount of time to wait

**Usage** driver.set_page_load_timeout(30)

**set_script_timeout**(*time_to_wait*)

**Set the amount of time that the script should wait during an** execute_async_script call before throwing an error.

**Args**

- time_to_wait: The amount of time to wait (in seconds)

**Usage** driver.set_script_timeout(30)

**set_window_position**(*x*, *y*, *windowHandle='current'*)
Sets the x,y position of the current window. (window.moveTo)

**Args**

- x: the x-coordinate in pixels to set the window position
- y: the y-coordinate in pixels to set the window position

**Usage** driver.set_window_position(0,0)

**set_window_rect**(*x=None*, *y=None*, *width=None*, *height=None*)
Sets the x, y coordinates of the window as well as height and width of the current window.

**Usage** driver.set_window_rect(x=10, y=10) driver.set_window_rect(width=100, height=200) driver.set_window_rect(x=10, y=10, width=100, height=200)

**set_window_size**(*width*, *height*, *windowHandle='current'*)
Sets the width and height of the current window. (window.resizeTo)

**Args**

- width: the width in pixels to set the window to
- height: the height in pixels to set the window to

**Usage** driver.set_window_size(800,600)

**start_client**()
Called before starting a new session. This method may be overridden to define custom startup behavior.

**start_session**(*capabilities*, *browser_profile=None*)
Creates a new session with the desired capabilities.

**Args**

- browser_name - The name of the browser to request.
- version - Which browser version to request.
- platform - Which platform to request the browser on.
- javascript_enabled - Whether the new session should support JavaScript.
- browser_profile - A selenium.webdriver.firefox.firefox_profile.FirefoxProfile object. Only used if Firefox is requested.

**stop_client**()
Called after executing a quit command. This method may be overridden to define custom shutdown behavior.

**switch_to_active_element**()
Deprecated use driver.switch_to.active_element

**switch_to_alert**()
Deprecated use driver.switch_to.alert

**switch_to_default_content**()
Deprecated use driver.switch_to.default_content

**switch_to_frame**(*frame_reference*)
Deprecated use driver.switch_to.frame

**switch_to_window**(*window_name*)
Deprecated use driver.switch_to.window

**application_cache**
Returns a ApplicationCache Object to interact with the browser app cache

**current_url**
Gets the URL of the current page.

**Usage** driver.current_url

**current_window_handle**
Returns the handle of the current window.

**Usage** driver.current_window_handle

**desired_capabilities**
returns the drivers current desired capabilities being used

**file_detector**

**log_types**
Gets a list of the available log types

**Usage** driver.log_types

**mobile**

**name**
Returns the name of the underlying browser for this instance.

**Usage** name = driver.name

**orientation**
Gets the current orientation of the device

**Usage** orientation = driver.orientation

**page_source**
Gets the source of the current page.

**Usage** driver.page_source

**switch_to**

**Returns**

- SwitchTo: an object containing all options to switch focus into

**Usage** element = driver.switch_to.active_element alert = driver.switch_to.alert driver.switch_to.default_content() driver.switch_to.frame('frame_name') driver.switch_to.frame(1) driver.switch_to.frame(driver.find_elements_by_tag_name("iframe")[0]) driver.switch_to.parent_frame() driver.switch_to.window('main')

**title**
Returns the title of the current page.

**Usage** title = driver.title

**window_handles**
Returns the handles of all windows within the current session.

**Usage** driver.window_handles

## 7.21 Remote WebDriver WebElement

**class** selenium.webdriver.remote.webelement.**WebElement**(*parent*, *id_*, *w3c=False*)
Bases: object

Represents a DOM element.

Generally, all interesting operations that interact with a document will be performed through this interface.

All method calls will do a freshness check to ensure that the element reference is still valid. This essentially determines whether or not the element is still attached to the DOM. If this test fails, then an `StaleElementReferenceException` is thrown, and all future calls to this instance will fail.

**__init__**(*parent*, *id_*, *w3c=False*)
Initialize self. See help(type(self)) for accurate signature.

**clear**()
Clears the text if it's a text entry element.

**click**()
Clicks the element.

**find_element**(*by='id'*, *value=None*)
Find an element given a By strategy and locator. Prefer the find_element_by_* methods when possible.

**Usage** element = element.find_element(By.ID, 'foo')

**Return type** *WebElement*

**find_element_by_class_name**(*name*)
Finds element within this element's children by class name.

**Args**

- name: The class name of the element to find.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_class_name('foo')

**find_element_by_css_selector**(*css_selector*)
Finds element within this element's children by CSS selector.

**Args**

- css_selector - CSS selector string, ex: 'a.nav#home'

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_css_selector('#foo')

**find_element_by_id**(*id_*)
Finds element within this element's children by ID.

**Args**

- id_ - ID of child element to locate.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** foo_element = element.find_element_by_id('foo')

**find_element_by_link_text** (*link_text*)
Finds element within this element's children by visible link text.

**Args**

- link_text - Link text string to search for.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_link_text('Sign In')

**find_element_by_name** (*name*)
Finds element within this element's children by name.

**Args**

- name - name property of the element to find.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_name('foo')

**find_element_by_partial_link_text** (*link_text*)
Finds element within this element's children by partially visible link text.

**Args**

- link_text: The text of the element to partially match on.

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_partial_link_text('Sign')

**find_element_by_tag_name** (*name*)
Finds element within this element's children by tag name.

**Args**

- name - name of html tag (eg: h1, a, span)

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_tag_name('h1')

**find_element_by_xpath**(*xpath*)
Finds element by xpath.

**Args**

- xpath - xpath of element to locate. "//input[@class='myelement']"

Note: The base path will be relative to this element's location.

This will select the first link under this element.

```
myelement.find_element_by_xpath(".//a")
```

However, this will select the first link on the page.

```
myelement.find_element_by_xpath("//a")
```

**Returns**

- WebElement - the element if it was found

**Raises**

- NoSuchElementException - if the element wasn't found

**Usage** element = element.find_element_by_xpath('//div/td[1]')

**find_elements**(*by='id'*, *value=None*)
Find elements given a By strategy and locator. Prefer the find_elements_by_* methods when possible.

**Usage** element = element.find_elements(By.CLASS_NAME, 'foo')

**Return type** list of WebElement

**find_elements_by_class_name**(*name*)
Finds a list of elements within this element's children by class name.

**Args**

- name: The class name of the elements to find.

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = element.find_elements_by_class_name('foo')

**find_elements_by_css_selector**(*css_selector*)
Finds a list of elements within this element's children by CSS selector.

**Args**

- css_selector - CSS selector string, ex: 'a.nav#home'

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = element.find_elements_by_css_selector('.foo')

**find_elements_by_id**(*id_*)
Finds a list of elements within this element's children by ID. Will return a list of webelements if found, or an empty list if not.

**Args**

- id_ - Id of child element to find.

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = element.find_elements_by_id('foo')

**find_elements_by_link_text** (*link_text*)
Finds a list of elements within this element's children by visible link text.

**Args**

- link_text - Link text string to search for.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = element.find_elements_by_link_text('Sign In')

**find_elements_by_name** (*name*)
Finds a list of elements within this element's children by name.

**Args**

- name - name property to search for.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = element.find_elements_by_name('foo')

**find_elements_by_partial_link_text** (*link_text*)
Finds a list of elements within this element's children by link text.

**Args**

- link_text: The text of the element to partial match on.

**Returns**

- list of webelement - a list with elements if any was found. an empty list if not

**Usage** elements = element.find_elements_by_partial_link_text('Sign')

**find_elements_by_tag_name** (*name*)
Finds a list of elements within this element's children by tag name.

**Args**

- name - name of html tag (eg: h1, a, span)

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = element.find_elements_by_tag_name('h1')

**find_elements_by_xpath** (*xpath*)
Finds elements within the element by xpath.

**Args**

- xpath - xpath locator string.

Note: The base path will be relative to this element's location.

This will select all links under this element.

```
myelement.find_elements_by_xpath(".//a")
```

However, this will select all links in the page itself.

```
myelement.find_elements_by_xpath("//a")
```

**Returns**

- list of WebElement - a list with elements if any was found. An empty list if not

**Usage** elements = element.find_elements_by_xpath("//div[contains(@class, 'foo')]")

**get_attribute**(*name*)

Gets the given attribute or property of the element.

This method will first try to return the value of a property with the given name. If a property with that name doesn't exist, it returns the value of the attribute with the same name. If there's no attribute with that name, `None` is returned.

Values which are considered truthy, that is equals "true" or "false", are returned as booleans. All other non-`None` values are returned as strings. For attributes or properties which do not exist, `None` is returned.

**Args**

- name - Name of the attribute/property to retrieve.

Example:

```
# Check if the "active" CSS class is applied to an element.
is_active = "active" in target_element.get_attribute("class")
```

**get_property**(*name*)

Gets the given property of the element.

**Args**

- name - Name of the property to retrieve.

Example:

```
text_length = target_element.get_property("text_length")
```

**is_displayed**()

Whether the element is visible to a user.

**is_enabled**()

Returns whether the element is enabled.

**is_selected**()

Returns whether the element is selected.

Can be used to check if a checkbox or radio button is selected.

**screenshot**(*filename*)

**Saves a screenshot of the current element to a PNG image file. Returns** False if there is any IOError, else returns True. Use full paths in your filename.

**Args**

- filename: The full path you wish to save your screenshot to. This should end with a *.png* extension.

**Usage** element.screenshot('/Screenshots/foo.png')

**send_keys**(**value*)
Simulates typing into the element.

**Args**

- value - A string for typing, or setting form fields. For setting file inputs, this could be a local file path.

Use this to send simple key events or to fill out form fields:

```
form_textfield = driver.find_element_by_name('username')
form_textfield.send_keys("admin")
```

This can also be used to set file inputs.

```
file_input = driver.find_element_by_name('profilePic')
file_input.send_keys("path/to/profilepic.gif")
# Generally it's better to wrap the file path in one of the methods
# in os.path to return the actual path to support cross OS testing.
# file_input.send_keys(os.path.abspath("path/to/profilepic.gif"))
```

**submit**()
Submits a form.

**value_of_css_property**(*property_name*)
The value of a CSS property.

**id**
Internal ID used by selenium.

This is mainly for internal use. Simple use cases such as checking if 2 webelements refer to the same element, can be done using ==:

```
if element1 == element2:
    print("These 2 are equal")
```

**location**
The location of the element in the renderable canvas.

**location_once_scrolled_into_view**
THIS PROPERTY MAY CHANGE WITHOUT WARNING. Use this to discover where on the screen an element is so that we can click it. This method should cause the element to be scrolled into view.

Returns the top lefthand corner location on the screen, or `None` if the element is not visible.

**parent**
Internal reference to the WebDriver instance this element was found from.

**rect**
A dictionary with the size and location of the element.

**screenshot_as_base64**
Gets the screenshot of the current element as a base64 encoded string.

**Usage** img_b64 = element.screenshot_as_base64

**screenshot_as_png**
Gets the screenshot of the current element as a binary data.

**Usage** element_png = element.screenshot_as_png

**size**
The size of the element.

**tag_name**
This element's `tagName` property.

**text**
The text of the element.

## 7.22 Remote WebDriver Command

**class** selenium.webdriver.remote.command.**Command**
Bases: object

Defines constants for the standard WebDriver commands.

While these constants have no meaning in and of themselves, they are used to marshal commands through a service that implements WebDriver's remote wire protocol:

https://github.com/SeleniumHQ/selenium/wiki/JsonWireProtocol

**ACCEPT_ALERT = 'acceptAlert'**

**ADD_COOKIE = 'addCookie'**

**CLEAR_APP_CACHE = 'clearAppCache'**

**CLEAR_ELEMENT = 'clearElement'**

**CLEAR_LOCAL_STORAGE = 'clearLocalStorage'**

**CLEAR_SESSION_STORAGE = 'clearSessionStorage'**

**CLICK = 'mouseClick'**

**CLICK_ELEMENT = 'clickElement'**

**CLOSE = 'close'**

**CONTEXT_HANDLES = 'getContextHandles'**

**CURRENT_CONTEXT_HANDLE = 'getCurrentContextHandle'**

**DELETE_ALL_COOKIES = 'deleteAllCookies'**

**DELETE_COOKIE = 'deleteCookie'**

**DELETE_SESSION = 'deleteSession'**

**DISMISS_ALERT = 'dismissAlert'**

**DOUBLE_CLICK = 'mouseDoubleClick'**

**DOUBLE_TAP = 'touchDoubleTap'**

**ELEMENT_SCREENSHOT = 'elementScreenshot'**

**EXECUTE_ASYNC_SCRIPT = 'executeAsyncScript'**

**EXECUTE_SCRIPT = 'executeScript'**

**EXECUTE_SQL = 'executeSql'**

**FIND_CHILD_ELEMENT = 'findChildElement'**

**FIND_CHILD_ELEMENTS = 'findChildElements'**

```
    FIND_ELEMENT = 'findElement'
    FIND_ELEMENTS = 'findElements'
    FLICK = 'touchFlick'
    FULLSCREEN_WINDOW = 'fullscreenWindow'
    GET = 'get'
    GET_ACTIVE_ELEMENT = 'getActiveElement'
    GET_ALERT_TEXT = 'getAlertText'
    GET_ALL_COOKIES = 'getCookies'
    GET_ALL_SESSIONS = 'getAllSessions'
    GET_APP_CACHE = 'getAppCache'
    GET_APP_CACHE_STATUS = 'getAppCacheStatus'
    GET_AVAILABLE_LOG_TYPES = 'getAvailableLogTypes'
    GET_COOKIE = 'getCookie'
    GET_CURRENT_URL = 'getCurrentUrl'
    GET_CURRENT_WINDOW_HANDLE = 'getCurrentWindowHandle'
    GET_ELEMENT_ATTRIBUTE = 'getElementAttribute'
    GET_ELEMENT_LOCATION = 'getElementLocation'
    GET_ELEMENT_LOCATION_ONCE_SCROLLED_INTO_VIEW = 'getElementLocationOnceScrolledIntoView
    GET_ELEMENT_PROPERTY = 'getElementProperty'
    GET_ELEMENT_RECT = 'getElementRect'
    GET_ELEMENT_SIZE = 'getElementSize'
    GET_ELEMENT_TAG_NAME = 'getElementTagName'
    GET_ELEMENT_TEXT = 'getElementText'
    GET_ELEMENT_VALUE = 'getElementValue'
    GET_ELEMENT_VALUE_OF_CSS_PROPERTY = 'getElementValueOfCssProperty'
    GET_LOCAL_STORAGE_ITEM = 'getLocalStorageItem'
    GET_LOCAL_STORAGE_KEYS = 'getLocalStorageKeys'
    GET_LOCAL_STORAGE_SIZE = 'getLocalStorageSize'
    GET_LOCATION = 'getLocation'
    GET_LOG = 'getLog'
    GET_NETWORK_CONNECTION = 'getNetworkConnection'
    GET_PAGE_SOURCE = 'getPageSource'
    GET_SCREEN_ORIENTATION = 'getScreenOrientation'
    GET_SESSION_STORAGE_ITEM = 'getSessionStorageItem'
    GET_SESSION_STORAGE_KEYS = 'getSessionStorageKeys'
    GET_SESSION_STORAGE_SIZE = 'getSessionStorageSize'
```

```
    GET_TITLE = 'getTitle'
    GET_WINDOW_HANDLES = 'getWindowHandles'
    GET_WINDOW_POSITION = 'getWindowPosition'
    GET_WINDOW_RECT = 'getWindowRect'
    GET_WINDOW_SIZE = 'getWindowSize'
    GO_BACK = 'goBack'
    GO_FORWARD = 'goForward'
    IMPLICIT_WAIT = 'implicitlyWait'
    IS_ELEMENT_DISPLAYED = 'isElementDisplayed'
    IS_ELEMENT_ENABLED = 'isElementEnabled'
    IS_ELEMENT_SELECTED = 'isElementSelected'
    LONG_PRESS = 'touchLongPress'
    MAXIMIZE_WINDOW = 'windowMaximize'
    MINIMIZE_WINDOW = 'minimizeWindow'
    MOUSE_DOWN = 'mouseButtonDown'
    MOUSE_UP = 'mouseButtonUp'
    MOVE_TO = 'mouseMoveTo'
    NEW_SESSION = 'newSession'
    QUIT = 'quit'
    REFRESH = 'refresh'
    REMOVE_LOCAL_STORAGE_ITEM = 'removeLocalStorageItem'
    REMOVE_SESSION_STORAGE_ITEM = 'removeSessionStorageItem'
    SCREENSHOT = 'screenshot'
    SEND_KEYS_TO_ACTIVE_ELEMENT = 'sendKeysToActiveElement'
    SEND_KEYS_TO_ELEMENT = 'sendKeysToElement'
    SET_ALERT_CREDENTIALS = 'setAlertCredentials'
    SET_ALERT_VALUE = 'setAlertValue'
    SET_ELEMENT_SELECTED = 'setElementSelected'
    SET_LOCAL_STORAGE_ITEM = 'setLocalStorageItem'
    SET_LOCATION = 'setLocation'
    SET_NETWORK_CONNECTION = 'setNetworkConnection'
    SET_SCREEN_ORIENTATION = 'setScreenOrientation'
    SET_SCRIPT_TIMEOUT = 'setScriptTimeout'
    SET_SESSION_STORAGE_ITEM = 'setSessionStorageItem'
    SET_TIMEOUTS = 'setTimeouts'
    SET_WINDOW_POSITION = 'setWindowPosition'
```

```
SET_WINDOW_RECT = 'setWindowRect'
SET_WINDOW_SIZE = 'setWindowSize'
SINGLE_TAP = 'touchSingleTap'
STATUS = 'status'
SUBMIT_ELEMENT = 'submitElement'
SWITCH_TO_CONTEXT = 'switchToContext'
SWITCH_TO_FRAME = 'switchToFrame'
SWITCH_TO_PARENT_FRAME = 'switchToParentFrame'
SWITCH_TO_WINDOW = 'switchToWindow'
TOUCH_DOWN = 'touchDown'
TOUCH_MOVE = 'touchMove'
TOUCH_SCROLL = 'touchScroll'
TOUCH_UP = 'touchUp'
UPLOAD_FILE = 'uploadFile'
W3C_ACCEPT_ALERT = 'w3cAcceptAlert'
W3C_ACTIONS = 'actions'
W3C_CLEAR_ACTIONS = 'clearActionState'
W3C_DISMISS_ALERT = 'w3cDismissAlert'
W3C_EXECUTE_SCRIPT = 'w3cExecuteScript'
W3C_EXECUTE_SCRIPT_ASYNC = 'w3cExecuteScriptAsync'
W3C_GET_ACTIVE_ELEMENT = 'w3cGetActiveElement'
W3C_GET_ALERT_TEXT = 'w3cGetAlertText'
W3C_GET_CURRENT_WINDOW_HANDLE = 'w3cGetCurrentWindowHandle'
W3C_GET_WINDOW_HANDLES = 'w3cGetWindowHandles'
W3C_GET_WINDOW_POSITION = 'w3cGetWindowPosition'
W3C_GET_WINDOW_SIZE = 'w3cGetWindowSize'
W3C_MAXIMIZE_WINDOW = 'w3cMaximizeWindow'
W3C_SET_ALERT_VALUE = 'w3cSetAlertValue'
W3C_SET_WINDOW_POSITION = 'w3cSetWindowPosition'
W3C_SET_WINDOW_SIZE = 'w3cSetWindowSize'
```

## 7.23 Remote WebDriver Error Handler

**class** selenium.webdriver.remote.errorhandler.**ErrorCode**

Bases: object

Error codes defined in the WebDriver wire protocol.

```
ELEMENT_CLICK_INTERCEPTED = [64, 'element click intercepted']
```

```
ELEMENT_IS_NOT_SELECTABLE = [15, 'element not selectable']
ELEMENT_NOT_INTERACTABLE = [60, 'element not interactable']
ELEMENT_NOT_VISIBLE = [11, 'element not visible']
IME_ENGINE_ACTIVATION_FAILED = [31, 'ime engine activation failed']
IME_NOT_AVAILABLE = [30, 'ime not available']
INSECURE_CERTIFICATE = ['insecure certificate']
INVALID_ARGUMENT = [61, 'invalid argument']
INVALID_COOKIE_DOMAIN = [24, 'invalid cookie domain']
INVALID_COORDINATES = ['invalid coordinates']
INVALID_ELEMENT_COORDINATES = [29, 'invalid element coordinates']
INVALID_ELEMENT_STATE = [12, 'invalid element state']
INVALID_SELECTOR = [32, 'invalid selector']
INVALID_SESSION_ID = ['invalid session id']
INVALID_XPATH_SELECTOR = [51, 'invalid selector']
INVALID_XPATH_SELECTOR_RETURN_TYPER = [52, 'invalid selector']
JAVASCRIPT_ERROR = [17, 'javascript error']
METHOD_NOT_ALLOWED = [405, 'unsupported operation']
MOVE_TARGET_OUT_OF_BOUNDS = [34, 'move target out of bounds']
NO_ALERT_OPEN = [27, 'no such alert']
NO_SUCH_COOKIE = [62, 'no such cookie']
NO_SUCH_ELEMENT = [7, 'no such element']
NO_SUCH_FRAME = [8, 'no such frame']
NO_SUCH_WINDOW = [23, 'no such window']
SCRIPT_TIMEOUT = [28, 'script timeout']
SESSION_NOT_CREATED = [33, 'session not created']
STALE_ELEMENT_REFERENCE = [10, 'stale element reference']
SUCCESS = 0
TIMEOUT = [21, 'timeout']
UNABLE_TO_CAPTURE_SCREEN = [63, 'unable to capture screen']
UNABLE_TO_SET_COOKIE = [25, 'unable to set cookie']
UNEXPECTED_ALERT_OPEN = [26, 'unexpected alert open']
UNKNOWN_COMMAND = [9, 'unknown command']
UNKNOWN_ERROR = [13, 'unknown error']
UNKNOWN_METHOD = ['unknown method exception']
XPATH_LOOKUP_ERROR = [19, 'invalid selector']
```

**class** selenium.webdriver.remote.errorhandler.**ErrorHandler**
Bases: object

Handles errors returned by the WebDriver server.

**check_response**(*response*)
Checks that a JSON response from the WebDriver does not have an error.

**Args**

- response - The JSON response from the WebDriver server as a dictionary object.

**Raises** If the response contains an error message.

## 7.24 Remote WebDriver Mobile

**class** selenium.webdriver.remote.mobile.**Mobile**(*driver*)
Bases: object

**class ConnectionType**(*mask*)
Bases: object

**__init__**(*mask*)
Initialize self. See help(type(self)) for accurate signature.

**airplane_mode**

**data**

**wifi**

**__init__**(*driver*)
Initialize self. See help(type(self)) for accurate signature.

**set_network_connection**(*network*)
Set the network connection for the remote device.

Example of setting airplane mode:

```
driver.mobile.set_network_connection(driver.mobile.AIRPLANE_MODE)
```

**AIRPLANE_MODE = <selenium.webdriver.remote.mobile.Mobile.ConnectionType object>**

**ALL_NETWORK = <selenium.webdriver.remote.mobile.Mobile.ConnectionType object>**

**DATA_NETWORK = <selenium.webdriver.remote.mobile.Mobile.ConnectionType object>**

**WIFI_NETWORK = <selenium.webdriver.remote.mobile.Mobile.ConnectionType object>**

**context**
returns the current context (Native or WebView).

**contexts**
returns a list of available contexts

**network_connection**

## 7.25 Remote WebDriver Remote Connection

**class** selenium.webdriver.remote.remote_connection.**RemoteConnection**(*remote_server_addr*, *keep_alive=False*, *resolve_ip=True*)

Bases: object

A connection with the Remote WebDriver server.

Communicates with the server using the WebDriver wire protocol: https://github.com/SeleniumHQ/selenium/wiki/JsonWireProtocol

**__init__**(*remote_server_addr*, *keep_alive=False*, *resolve_ip=True*)
Initialize self. See help(type(self)) for accurate signature.

**execute**(*command*, *params*)
Send a command to the remote server.

Any path subtitutions required for the URL mapped to the command should be included in the command parameters.

**Args**

- command - A string specifying the command to execute.
- params - A dictionary of named parameters to send with the command as its JSON payload.

**classmethod get_remote_connection_headers**(*parsed_url*, *keep_alive=False*)
Get headers for remote request.

**Args**

- parsed_url - The parsed url
- keep_alive (Boolean) - Is this a keep-alive connection (default: False)

**classmethod get_timeout**()

**Returns** Timeout value in seconds for all http requests made to the Remote Connection

**classmethod reset_timeout**()
Reset the http request timeout to socket._GLOBAL_DEFAULT_TIMEOUT

**classmethod set_timeout**(*timeout*)
Override the default timeout

**Args**

- timeout - timeout value for http requests in seconds

## 7.26 Remote WebDriver Utils

selenium.webdriver.remote.utils.**dump_json**(*json_struct*)

selenium.webdriver.remote.utils.**format_json**(*json_struct*)

selenium.webdriver.remote.utils.**load_json**(*s*)

selenium.webdriver.remote.utils.**unzip_to_temp_dir**(*zip_file_name*)
Unzip zipfile to a temporary directory.

The directory of the unzipped files is returned if success, otherwise None is returned.

## 7.27 Internet Explorer WebDriver

**class** selenium.webdriver.ie.webdriver.**WebDriver**(*executable_path='IEDriverServer.exe'*, *capabilities=None*, *port=0*, *timeout=30*, *host=None*, *log_level=None*, *service_log_path=None*, *options=None*, *ie_options=None*, *desired_capabilities=None*, *log_file=None*, *keep_alive=False*)
Bases: *selenium.webdriver.remote.webdriver.WebDriver*

Controls the IEServerDriver and allows you to drive Internet Explorer

**__init__**(*executable_path='IEDriverServer.exe'*, *capabilities=None*, *port=0*, *timeout=30*, *host=None*, *log_level=None*, *service_log_path=None*, *options=None*, *ie_options=None*, *desired_capabilities=None*, *log_file=None*, *keep_alive=False*)
Creates a new instance of the chrome driver.

Starts the service and then creates new instance of chrome driver.

**Args**

- executable_path - path to the executable. If the default is used it assumes the executable is in the $PATH
- capabilities: capabilities Dictionary object
- port - port you would like the service to run, if left as 0, a free port will be found.
- timeout - no longer used, kept for backward compatibility
- host - IP address for the service
- log_level - log level you would like the service to run.
- service_log_path - target of logging of service, may be "stdout", "stderr" or file path.
- options - IE Options instance, providing additional IE options
- ie_options - Deprecated argument for options
- desired_capabilities - alias of capabilities; this will make the signature consistent with RemoteWebDriver.
- log_file - Deprecated argument for service_log_path
- keep_alive - Whether to configure RemoteConnection to use HTTP keep-alive.

**create_options**()

**quit**()
Quits the driver and closes every associated window.

**Usage** driver.quit()

## 7.28 Android WebDriver

**class** selenium.webdriver.android.webdriver.**WebDriver**(*host='localhost'*, *port=4444*, *desired_capabilities={'browserName': 'android', 'platform': 'ANDROID', 'version': ''}*)

Bases: *selenium.webdriver.remote.webdriver.WebDriver*

Simple RemoteWebDriver wrapper to start connect to Selendroid's WebView app

For more info on getting started with Selendroid http://selendroid.io/mobileWeb.html

**__init__**(*host='localhost'*, *port=4444*, *desired_capabilities={'browserName': 'android', 'platform': 'ANDROID', 'version': ''}*)

Creates a new instance of Selendroid using the WebView app

**Args**

- host - location of where selendroid is running
- port - port that selendroid is running on
- desired_capabilities: Dictionary object with capabilities

## 7.29 Opera WebDriver

**class** selenium.webdriver.opera.webdriver.**OperaDriver**(*executable_path=None*, *port=0*, *options=None*, *service_args=None*, *desired_capabilities=None*, *service_log_path=None*, *opera_options=None*, *keep_alive=True*)

Bases: *selenium.webdriver.chrome.webdriver.WebDriver*

Controls the new OperaDriver and allows you to drive the Opera browser based on Chromium.

**__init__**(*executable_path=None*, *port=0*, *options=None*, *service_args=None*, *desired_capabilities=None*, *service_log_path=None*, *opera_options=None*, *keep_alive=True*)

Creates a new instance of the operadriver.

Starts the service and then creates new instance of operadriver.

**Args**

- **executable_path - path to the executable. If the default is used** it assumes the executable is in the $PATH
- **port - port you would like the service to run, if left as 0,** a free port will be found.
- options: this takes an instance of OperaOptions
- service_args - List of args to pass to the driver service
- desired_capabilities: Dictionary object with non-browser specific
- service_log_path - Where to log information from the driver.
- opera_options - Deprecated argument for options capabilities only, such as "proxy" or "loggingPref".

**create_options**()

**class** selenium.webdriver.opera.webdriver.**WebDriver**(*desired_capabilities=None*, *executable_path=None*, *port=0*, *service_log_path=None*, *service_args=None*, *options=None*)

Bases: *selenium.webdriver.opera.webdriver.OperaDriver*

**class ServiceType**

Bases: object

**CHROMIUM = 2**

**__init__**(*desired_capabilities=None*, *executable_path=None*, *port=0*, *service_log_path=None*, *service_args=None*, *options=None*)

Creates a new instance of the operadriver.

Starts the service and then creates new instance of operadriver.

**Args**

- **executable_path - path to the executable. If the default is used** it assumes the executable is in the $PATH
- **port - port you would like the service to run, if left as 0,** a free port will be found.
- options: this takes an instance of OperaOptions
- service_args - List of args to pass to the driver service
- desired_capabilities: Dictionary object with non-browser specific
- service_log_path - Where to log information from the driver.
- opera_options - Deprecated argument for options capabilities only, such as "proxy" or "loggingPref".

## 7.30 PhantomJS WebDriver

**class** selenium.webdriver.phantomjs.webdriver.**WebDriver**(*executable_path='phantomjs'*, *port=0*, *desired_capabilities={'browserName': 'phantomjs', 'javascriptEnabled': True, 'platform': 'ANY', 'version': ''}*, *service_args=None*, *service_log_path=None*)

Bases: *selenium.webdriver.remote.webdriver.WebDriver*

Wrapper to communicate with PhantomJS through Ghostdriver.

You will need to follow all the directions here: https://github.com/detro/ghostdriver

**__init__**(*executable_path='phantomjs'*, *port=0*, *desired_capabilities={'browserName': 'phantomjs', 'javascriptEnabled': True, 'platform': 'ANY', 'version': ''}*, *service_args=None*, *service_log_path=None*)

Creates a new instance of the PhantomJS / Ghostdriver.

Starts the service and then creates new instance of the driver.

**Args**

- executable_path - path to the executable. If the default is used it assumes the executable is in the $PATH
- port - port you would like the service to run, if left as 0, a free port will be found.
- desired_capabilities: Dictionary object with non-browser specific capabilities only, such as "proxy" or "loggingPref".
- service_args : A List of command line arguments to pass to PhantomJS
- service_log_path: Path for phantomjs service to log to.

**quit**()
Closes the browser and shuts down the PhantomJS executable that is started when starting the PhantomJS

## 7.31 PhantomJS WebDriver Service

**class** selenium.webdriver.phantomjs.service.**Service**(*executable_path*, *port=0*, *service_args=None*, *log_path=None*)
Bases: *selenium.webdriver.common.service.Service*

Object that manages the starting and stopping of PhantomJS / Ghostdriver

**__init__**(*executable_path*, *port=0*, *service_args=None*, *log_path=None*)
Creates a new instance of the Service

**Args**

- executable_path : Path to PhantomJS binary
- port : Port the service is running on
- service_args : A List of other command line options to pass to PhantomJS
- log_path: Path for PhantomJS service to log to

**command_line_args**()

**send_remote_shutdown_command**()

**service_url**
Gets the url of the GhostDriver Service

## 7.32 Safari WebDriver

**class** selenium.webdriver.safari.webdriver.**WebDriver**(*port=0*, *executable_path='/usr/bin/safaridriver'*, *reuse_service=False*, *desired_capabilities={'browserName': 'safari', 'platform': 'MAC', 'version': ''}*, *quiet=False*, *keep_alive=True*, *service_args=None*)
Bases: *selenium.webdriver.remote.webdriver.WebDriver*

Controls the SafariDriver and allows you to drive the browser.

**__init__**(*port=0*, *executable_path='/usr/bin/safaridriver'*, *reuse_service=False*, *desired_capabilities={'browserName': 'safari', 'platform': 'MAC', 'version': ''}*, *quiet=False*, *keep_alive=True*, *service_args=None*)

Creates a new Safari driver instance and launches or finds a running safaridriver service.

**Args**

- port - The port on which the safaridriver service should listen for new connections. If zero, a free port will be found.
- executable_path - Path to a custom safaridriver executable to be used. If absent, /usr/bin/safaridriver is used.
- reuse_service - If True, do not spawn a safaridriver instance; instead, connect to an already-running service that was launched externally.
- desired_capabilities: Dictionary object with desired capabilities (Can be used to provide various Safari switches).
- quiet - If True, the driver's stdout and stderr is suppressed.
- **keep_alive - Whether to configure SafariRemoteConnection to use** HTTP keep-alive. Defaults to False.
- service_args : List of args to pass to the safaridriver service

**debug**()

**get_permission**(*permission*)

**quit**()

Closes the browser and shuts down the SafariDriver executable that is started when starting the SafariDriver

**set_permission**(*permission*, *value*)

## 7.33 Safari WebDriver Service

**class** selenium.webdriver.safari.service.**Service**(*executable_path*, *port=0*, *quiet=False*, *service_args=None*)

Bases: *selenium.webdriver.common.service.Service*

Object that manages the starting and stopping of the SafariDriver

**__init__**(*executable_path*, *port=0*, *quiet=False*, *service_args=None*)

Creates a new instance of the Service

**Args**

- executable_path : Path to the SafariDriver
- port : Port the service is running on
- quiet : Suppress driver stdout and stderr
- service_args : List of args to pass to the safaridriver service

**command_line_args**()

**service_url**

Gets the url of the SafariDriver Service

## 7.34 Select Support

**class** selenium.webdriver.support.select.**Select**(*webelement*)

Bases: object

**__init__**(*webelement*)

Constructor. A check is made that the given element is, indeed, a SELECT tag. If it is not, then an UnexpectedTagNameException is thrown.

**Args**

- webelement - element SELECT element to wrap

**Example:** from selenium.webdriver.support.ui import Select

Select(driver.find_element_by_tag_name("select")).select_by_index(2)

**deselect_all**()

Clear all selected entries. This is only valid when the SELECT supports multiple selections. throws NotImplementedError If the SELECT does not support multiple selections

**deselect_by_index**(*index*)

Deselect the option at the given index. This is done by examing the "index" attribute of an element, and not merely by counting.

**Args**

- index - The option at this index will be deselected

throws NoSuchElementException If there is no option with specisied index in SELECT

**deselect_by_value**(*value*)

Deselect all options that have a value matching the argument. That is, when given "foo" this would deselect an option like:

<option value="foo">Bar</option>

**Args**

- value - The value to match against

throws NoSuchElementException If there is no option with specisied value in SELECT

**deselect_by_visible_text**(*text*)

Deselect all options that display text matching the argument. That is, when given "Bar" this would deselect an option like:

<option value="foo">Bar</option>

**Args**

- text - The visible text to match against

**select_by_index**(*index*)

Select the option at the given index. This is done by examing the "index" attribute of an element, and not merely by counting.

**Args**

- index - The option at this index will be selected

throws NoSuchElementException If there is no option with specisied index in SELECT

**select_by_value**(*value*)
Select all options that have a value matching the argument. That is, when given “foo” this would select an option like:

<option value=”foo”>Bar</option>

**Args**

- value - The value to match against

throws NoSuchElementException If there is no option with specisied value in SELECT

**select_by_visible_text**(*text*)
Select all options that display text matching the argument. That is, when given “Bar” this would select an option like:

<option value=”foo”>Bar</option>

**Args**

- text - The visible text to match against

throws NoSuchElementException If there is no option with specisied text in SELECT

**all_selected_options**
Returns a list of all selected options belonging to this select tag

**first_selected_option**
The first selected option in this select tag (or the currently selected option in a normal select)

**options**
Returns a list of all options belonging to this select tag

## 7.35 Wait Support

**class** selenium.webdriver.support.wait.**WebDriverWait**(*driver*, *timeout*, *poll_frequency=0.5*, *ignored_exceptions=None*)
Bases: object

**__init__**(*driver*, *timeout*, *poll_frequency=0.5*, *ignored_exceptions=None*)
Constructor, takes a WebDriver instance and timeout in seconds.

**Args**

- driver - Instance of WebDriver (Ie, Firefox, Chrome or Remote)
- timeout - Number of seconds before timing out
- poll_frequency - sleep interval between calls By default, it is 0.5 second.
- ignored_exceptions - iterable structure of exception classes ignored during calls. By default, it contains NoSuchElementException only.

**Example:** from selenium.webdriver.support.ui import WebDriverWait

element = WebDriverWait(driver, 10).until(lambda x: x.find_element_by_id(“someId”))

is_disappeared = WebDriverWait(driver, 30, 1, (ElementNotVisibleException)).

until_not(lambda x: x.find_element_by_id(“someId”).is_displayed())

**until**(*method*, *message=''*)
Calls the method provided with the driver as an argument until the return value is not False.

**until_not**(*method*, *message=''*)
Calls the method provided with the driver as an argument until the return value is False.

## 7.36 Color Support

**class** selenium.webdriver.support.color.**Color**(*red*, *green*, *blue*, *alpha=1*)
Bases: object

Color conversion support class

Example:

```
from selenium.webdriver.support.color import Color

print(Color.from_string('#00ff33').rgba)
print(Color.from_string('rgb(1, 255, 3)').hex)
print(Color.from_string('blue').rgba)
```

**__init__**(*red*, *green*, *blue*, *alpha=1*)
Initialize self. See help(type(self)) for accurate signature.

**static from_string**(*str_*)

**hex**

**rgb**

**rgba**

## 7.37 Event Firing WebDriver Support

**class** selenium.webdriver.support.event_firing_webdriver.**EventFiringWebDriver**(*driver*, *event_listener*)
Bases: object

A wrapper around an arbitrary WebDriver instance which supports firing events

**__init__**(*driver*, *event_listener*)
Creates a new instance of the EventFiringWebDriver

**Args**

- driver : A WebDriver instance
- event_listener : Instance of a class that subclasses AbstractEventListener and implements it fully or partially

Example:

```
from selenium.webdriver import Firefox
from selenium.webdriver.support.events import EventFiringWebDriver,␣
↪AbstractEventListener

class MyListener(AbstractEventListener):
    def before_navigate_to(self, url, driver):
```

(continues on next page)

(continued from previous page)

```
        print("Before navigate to %s" % url)
    def after_navigate_to(self, url, driver):
        print("After navigate to %s" % url)

driver = Firefox()
ef_driver = EventFiringWebDriver(driver, MyListener())
ef_driver.get("http://www.google.co.in/")
```

**back**()

**close**()

**execute_async_script**(*script*, **args*)

**execute_script**(*script*, **args*)

**find_element**(*by='id'*, *value=None*)

**find_element_by_class_name**(*name*)

**find_element_by_css_selector**(*css_selector*)

**find_element_by_id**(*id_*)

**find_element_by_link_text**(*link_text*)

**find_element_by_name**(*name*)

**find_element_by_partial_link_text**(*link_text*)

**find_element_by_tag_name**(*name*)

**find_element_by_xpath**(*xpath*)

**find_elements**(*by='id'*, *value=None*)

**find_elements_by_class_name**(*name*)

**find_elements_by_css_selector**(*css_selector*)

**find_elements_by_id**(*id_*)

**find_elements_by_link_text**(*text*)

**find_elements_by_name**(*name*)

**find_elements_by_partial_link_text**(*link_text*)

**find_elements_by_tag_name**(*name*)

**find_elements_by_xpath**(*xpath*)

**forward**()

**get**(*url*)

**quit**()

**wrapped_driver**
Returns the WebDriver instance wrapped by this EventsFiringWebDriver

**class** selenium.webdriver.support.event_firing_webdriver.**EventFiringWebElement**(*webelement*, *ef_driver*)

Bases: object

" A wrapper around WebElement instance which supports firing events

**__init__**(*webelement*, *ef_driver*)
Creates a new instance of the EventFiringWebElement

**clear**()

**click**()

**find_element**(*by='id'*, *value=None*)

**find_element_by_class_name**(*name*)

**find_element_by_css_selector**(*css_selector*)

**find_element_by_id**(*id_*)

**find_element_by_link_text**(*link_text*)

**find_element_by_name**(*name*)

**find_element_by_partial_link_text**(*link_text*)

**find_element_by_tag_name**(*name*)

**find_element_by_xpath**(*xpath*)

**find_elements**(*by='id'*, *value=None*)

**find_elements_by_class_name**(*name*)

**find_elements_by_css_selector**(*css_selector*)

**find_elements_by_id**(*id_*)

**find_elements_by_link_text**(*link_text*)

**find_elements_by_name**(*name*)

**find_elements_by_partial_link_text**(*link_text*)

**find_elements_by_tag_name**(*name*)

**find_elements_by_xpath**(*xpath*)

**send_keys**(**value*)

**wrapped_element**
Returns the WebElement wrapped by this EventFiringWebElement instance

## 7.38 Abstract Event Listener Support

**class** selenium.webdriver.support.abstract_event_listener.**AbstractEventListener**
Bases: object

Event listener must subclass and implement this fully or partially

**after_change_value_of**(*element*, *driver*)

**after_click**(*element*, *driver*)

**after_close**(*driver*)

**after_execute_script**(*script*, *driver*)

**after_find**(*by*, *value*, *driver*)

**after_navigate_back**(*driver*)

**after_navigate_forward**(*driver*)

**after_navigate_to**(*url*, *driver*)

**after_quit**(*driver*)

**before_change_value_of**(*element*, *driver*)

**before_click**(*element*, *driver*)

**before_close**(*driver*)

**before_execute_script**(*script*, *driver*)

**before_find**(*by*, *value*, *driver*)

**before_navigate_back**(*driver*)

**before_navigate_forward**(*driver*)

**before_navigate_to**(*url*, *driver*)

**before_quit**(*driver*)

**on_exception**(*exception*, *driver*)

## 7.39 Expected conditions Support

**class** selenium.webdriver.support.expected_conditions.**alert_is_present**
Bases: object

Expect an alert to be present.

**__init__**()
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**element_located_selection_state_to_be**

Bases: object

An expectation to locate an element and check if the selection state specified is in that state. locator is a tuple of (by, path) is_selected is a boolean

**__init__**(*locator*, *is_selected*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**element_located_to_be_selected**(*locator*)
Bases: object

An expectation for the element to be located is selected. locator is a tuple of (by, path)

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**element_selection_state_to_be**(*element*, *is_selected*

Bases: object

An expectation for checking if the given element is selected. element is WebElement object is_selected is a Boolean."

**__init__**(*element*, *is_selected*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**element_to_be_clickable**(*locator*)
Bases: object

An Expectation for checking an element is visible and enabled such that you can click it.

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**element_to_be_selected**(*element*)
Bases: object

An expectation for checking the selection is selected. element is WebElement object

**__init__**(*element*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**frame_to_be_available_and_switch_to_it**
Bases: object

An expectation for checking whether the given frame is available to switch to. If the frame is available it switches the given driver to the specified frame.

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**invisibility_of_element**(*locator*)
Bases: *selenium.webdriver.support.expected_conditions.invisibility_of_element_located*

An Expectation for checking that an element is either invisible or not present on the DOM.

element is either a locator (text) or an WebElement

**class** selenium.webdriver.support.expected_conditions.**invisibility_of_element_located**(*locator*)
Bases: object

An Expectation for checking that an element is either invisible or not present on the DOM.

locator used to find the element

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**new_window_is_opened**(*current_handles*)
Bases: object

An expectation that a new window will be opened and have the number of windows handles increase

**__init__**(*current_handles*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**number_of_windows_to_be**(*num_windows*)
Bases: object

An expectation for the number of windows to be a certain value.

**__init__**(*num_windows*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**presence_of_all_elements_located**(*locator*)
Bases: object

An expectation for checking that there is at least one element present on a web page. locator is used to find the element returns the list of WebElements once they are located

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**presence_of_element_located**(*locator*)
Bases: object

An expectation for checking that an element is present on the DOM of a page. This does not necessarily mean that the element is visible. locator - used to find the element returns the WebElement once it is located

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**staleness_of**(*element*)
Bases: object

Wait until an element is no longer attached to the DOM. element is the element to wait for. returns False if the element is still attached to the DOM, true otherwise.

**__init__**(*element*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**text_to_be_present_in_element**(*locator*, *text_*)
Bases: object

An expectation for checking if the given text is present in the specified element. locator, text

**__init__**(*locator*, *text_*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**text_to_be_present_in_element_value**(*lo*
*te*
Bases: object

An expectation for checking if the given text is present in the element's locator, text

**__init__**(*locator*, *text_*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**title_contains**(*title*)
Bases: object

An expectation for checking that the title contains a case-sensitive substring. title is the fragment of title expected returns True when the title matches, False otherwise

**__init__**(*title*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**title_is**(*title*)
Bases: object

An expectation for checking the title of a page. title is the expected title, which must be an exact match returns True if the title matches, false otherwise.

**__init__**(*title*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**url_changes**(*url*)
Bases: object

An expectation for checking the current url. url is the expected url, which must not be an exact match returns True if the url is different, false otherwise.

**__init__**(*url*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**url_contains**(*url*)
Bases: object

An expectation for checking that the current url contains a case-sensitive substring. url is the fragment of url expected, returns True when the url matches, False otherwise

**__init__**(*url*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**url_matches**(*pattern*)
Bases: object

An expectation for checking the current url. pattern is the expected pattern, which must be an exact match returns True if the url matches, false otherwise.

**__init__**(*pattern*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**url_to_be**(*url*)
Bases: object

An expectation for checking the current url. url is the expected url, which must be an exact match returns True if the url matches, false otherwise.

**__init__**(*url*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**visibility_of**(*element*)
Bases: object

An expectation for checking that an element, known to be present on the DOM of a page, is visible. Visibility means that the element is not only displayed but also has a height and width that is greater than 0. element is the WebElement returns the (same) WebElement once it is visible

**__init__**(*element*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**visibility_of_all_elements_located**(*loc*
Bases: object

An expectation for checking that all elements are present on the DOM of a page and visible. Visibility means that the elements are not only displayed but also has a height and width that is greater than 0. locator - used to find the elements returns the list of WebElements once they are located and visible

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**visibility_of_any_elements_located**(*loc*
Bases: object

An expectation for checking that there is at least one element visible on a web page. locator is used to find the element returns the list of WebElements once they are located

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

**class** selenium.webdriver.support.expected_conditions.**visibility_of_element_located**(*locator*)
Bases: object

An expectation for checking that an element is present on the DOM of a page and visible. Visibility means that the element is not only displayed but also has a height and width that is greater than 0. locator - used to find the element returns the WebElement once it is located and visible

**__init__**(*locator*)
Initialize self. See help(type(self)) for accurate signature.

CHAPTER 8

# Appendix: Frequently Asked Questions

Another FAQ: https://github.com/SeleniumHQ/selenium/wiki/Frequently-Asked-Questions

## 8.1 How to use ChromeDriver ?

Download the latest chromedriver from download page. Unzip the file:

```
unzip chromedriver_linux32_x.x.x.x.zip
```

You should see a `chromedriver` executable. Now you can create an instance of Chrome WebDriver like this:

```
driver = webdriver.Chrome(executable_path="/path/to/chromedriver")
```

The rest of the example should work as given in other documentation.

## 8.2 Does Selenium 2 support XPath 2.0 ?

Ref: http://seleniumhq.org/docs/03_webdriver.html#how-xpath-works-in-webdriver

Selenium delegates XPath queries down to the browser's own XPath engine, so Selenium support XPath supports whatever the browser supports. In browsers which don't have native XPath engines (IE 6,7,8), Selenium supports XPath 1.0 only.

## 8.3 How to scroll down to the bottom of a page ?

Ref: http://blog.varunin.com/2011/08/scrolling-on-pages-using-selenium.html

You can use the *execute_script* method to execute javascript on the loaded page. So, you can call the JavaScript API to scroll to the bottom or any other position of a page.

Here is an example to scroll to the bottom of a page:

```
driver.execute_script("window.scrollTo(0, document.body.scrollHeight);")
```

The window object in DOM has a scrollTo method to scroll to any position of an opened window. The scrollHeight is a common property for all elements. The *document.body.scrollHeight* will give the height of the entire body of the page.

## 8.4 How to auto save files using custom Firefox profile ?

Ref: http://stackoverflow.com/questions/1176348/access-to-file-download-dialog-in-firefox

Ref: http://blog.codecentric.de/en/2010/07/file-downloads-with-selenium-mission-impossible/

The first step is to identify the type of file you want to auto save.

To identify the content type you want to download automatically, you can use curl:

```
curl -I URL | grep "Content-Type"
```

Another way to find content type is using the requests module, you can use it like this:

```
import requests
content_type = requests.head('http://www.python.org').headers['content-type']
print(content_type)
```

Once the content type is identified, you can use it to set the firefox profile preference: `browser.helperApps.neverAsk.saveToDisk`

Here is an example:

```
import os

from selenium import webdriver

fp = webdriver.FirefoxProfile()

fp.set_preference("browser.download.folderList",2)
fp.set_preference("browser.download.manager.showWhenStarting",False)
fp.set_preference("browser.download.dir", os.getcwd())
fp.set_preference("browser.helperApps.neverAsk.saveToDisk", "application/octet-stream
↪")

browser = webdriver.Firefox(firefox_profile=fp)
browser.get("http://pypi.python.org/pypi/selenium")
browser.find_element_by_partial_link_text("selenium-2").click()
```

In the above example, `application/octet-stream` is used as the content type.

The `browser.download.dir` option specify the directory where you want to download the files.

## 8.5 How to upload files into file inputs ?

Select the `<input type="file">` element and call the `send_keys()` method passing the file path, either the path relative to the test script, or an absolute path. Keep in mind the differences in path names between Windows and Unix systems.

## 8.6 How to use firebug with Firefox ?

First download the Firebug XPI file, later you call the `add_extension` method available for the firefox profile:

```
from selenium import webdriver

fp = webdriver.FirefoxProfile()

fp.add_extension(extension='firebug-1.8.4.xpi')
fp.set_preference("extensions.firebug.currentVersion", "1.8.4") #Avoid startup screen
browser = webdriver.Firefox(firefox_profile=fp)
```

## 8.7 How to take screenshot of the current window ?

Use the *save_screenshot* method provided by the webdriver:

```
from selenium import webdriver

driver = webdriver.Firefox()
driver.get('http://www.python.org/')
driver.save_screenshot('screenshot.png')
driver.quit()
```

CHAPTER 9

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