



CP-SAT SELENIUM SUMMIT 2021

Selenium Power Tools

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Quick Poll

Selenium is not a testing tool!

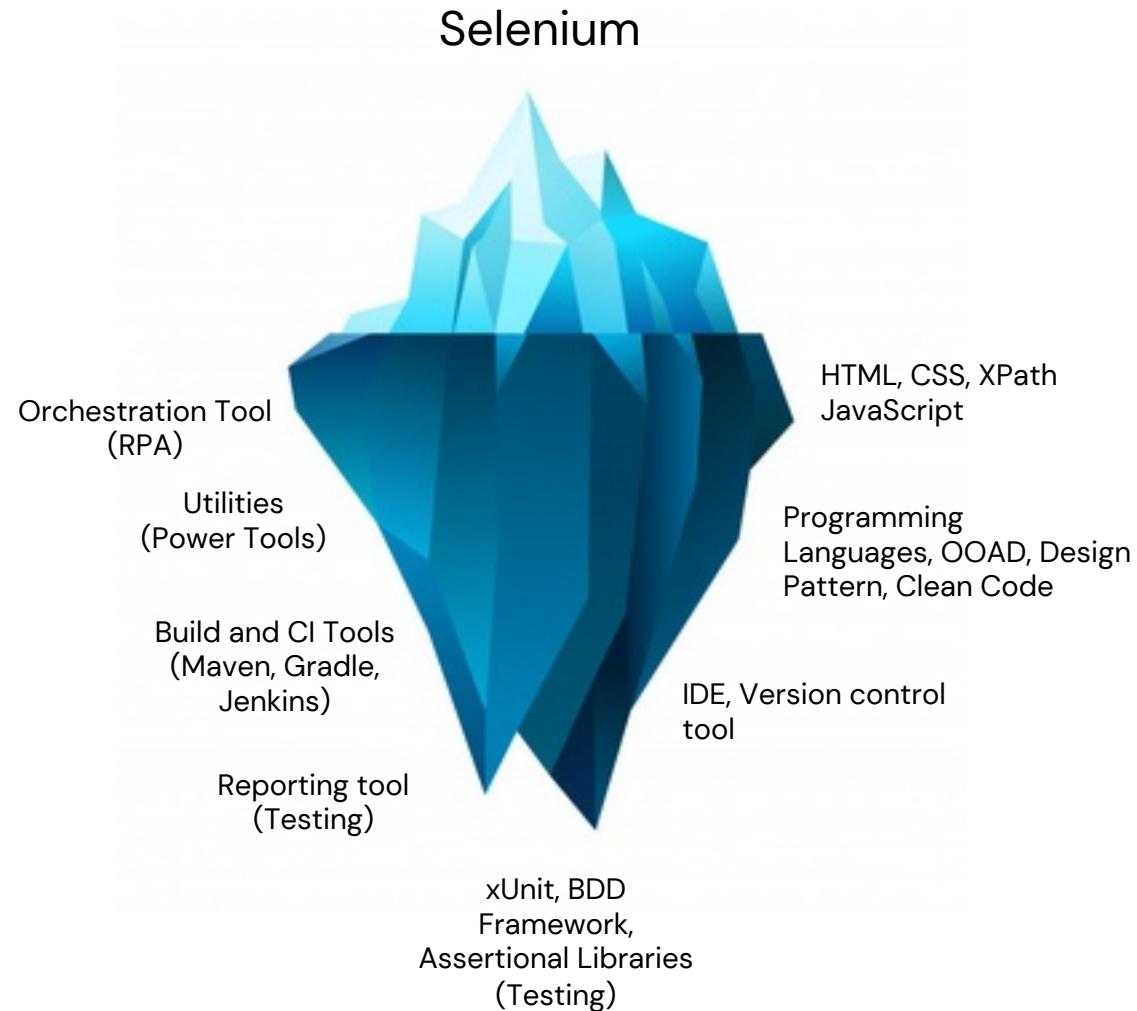
Selenium automates browsers. That's it!
What you do with that power is entirely up to you.

www.selenium.dev

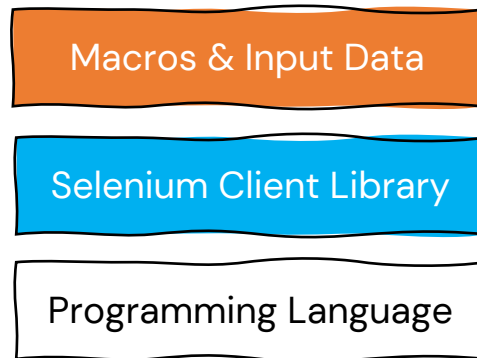
Selenium Use Cases

- Create Macro for automating repetitive tasks in a Browser window
 - Screen scrapping – e.g., find cheap hotels, flights...
 - Personal productivity – Filling timesheets, checking status
 - Stock trading (yeah!)
- Robotic Process Automation
- and most importantly testing or checking! (as in automated test execution tool)

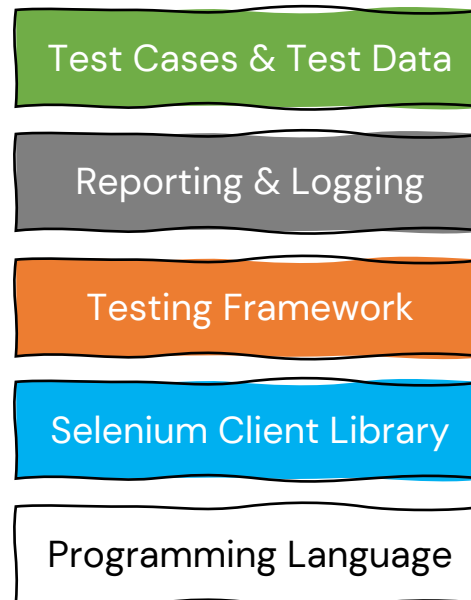
The Selenium Iceberg



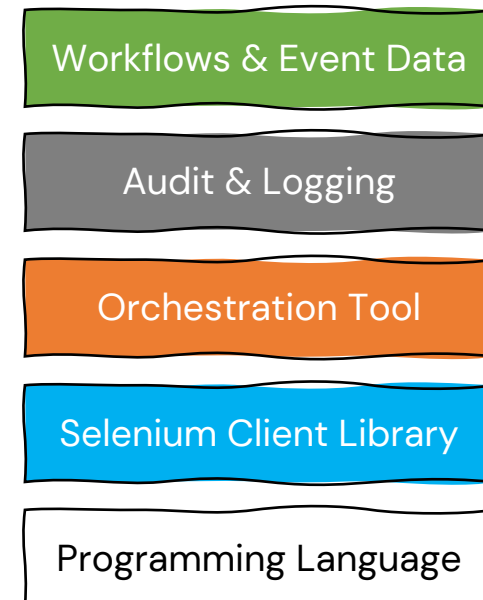
Selenium Stacks



As a Browser automation Macro



As a Testing Tool



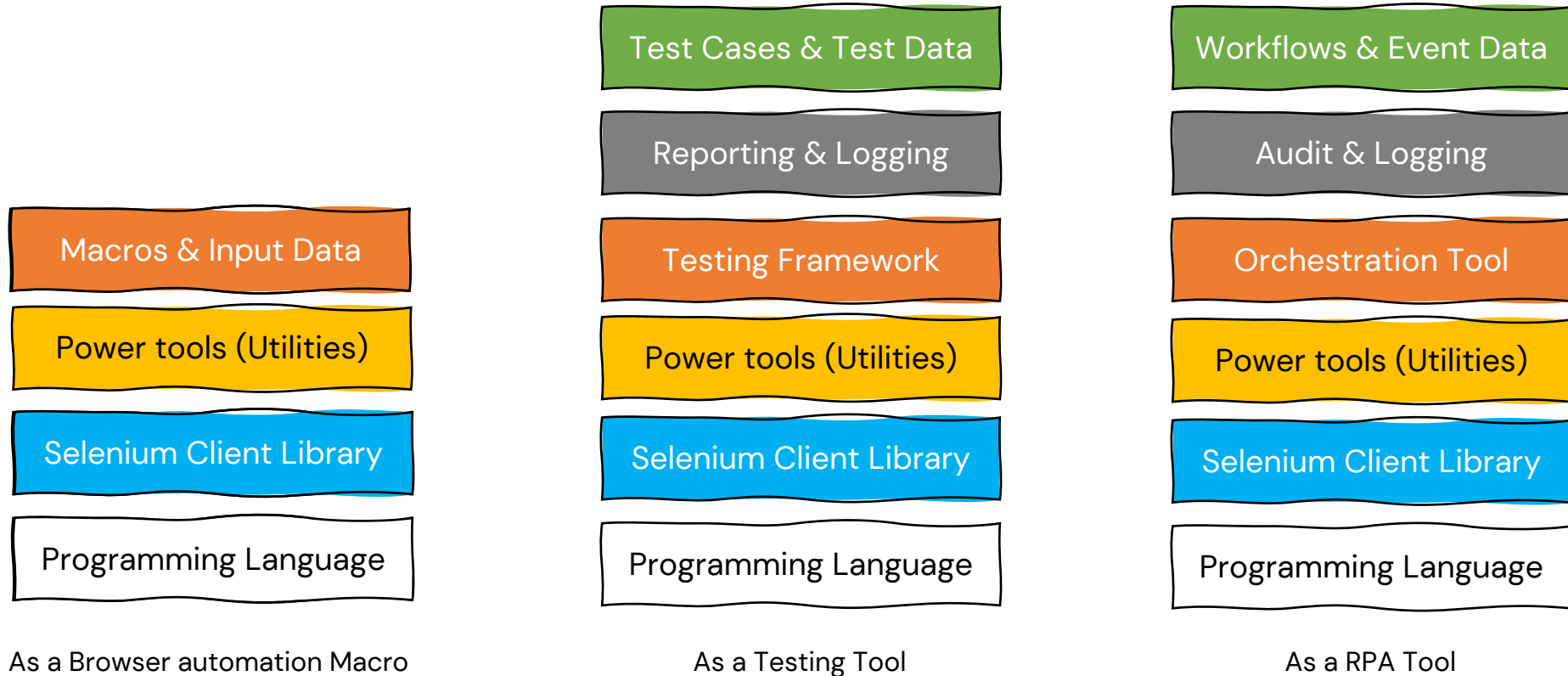
As a RPA Tool

? Frequently asked questions

- Does Selenium support Windows or Java Applications, Mainframes?
- Can we automate APIs with Selenium?
- How to test PDFs with Selenium?
- How to automate downloading browser drivers?
- How to take element screenshots?
- How to compare images in Selenium?
- How to check text on a image using Selenium?
- How to generate test data for Selenium tests?
- How to remove flakiness of tests due to application dependencies?
- and many more...

Stacks with Power Tools

In order to support such requirements, you can combine Selenium with other libraries (Power tools)





Everything that we discuss in this session is Open Source, no commercial or protected freeware stuff!

#respect #open-source

Six Power Tools

1

WebDriverManager

2

ShutterBug

3

Tesseract

4

Faker & Friends

5

WireMock

6

PDFBox

1 WebDriverManager



- WebDriverManager is a library which allows to automate the management of the drivers (e.g. chromedriver, geckodriver, etc.) required by Selenium WebDriver
- Once configured WebDriverManager will automatically download configured browser drivers for your tests
- Use as a dependency, command line tool, server, docker container...

WebDriverManager – How to use it?

- 1 Find out the browser version
- 2 Download the driver version compatible with the browser version
- 3 Set system property in test with the location of binary

```
@Before
public void setup() {
    System.setProperty("webdriver.chrome.driver",
        "/Users/upgundecha/Downloads");
    driver = new ChromeDriver();
}
```

- 1 Add WebDriverManager dependency
- 2 Select the browser which you need, that's it! WebDriverManager will do the magic for you

```
@Before
public void setup() {
    WebDriverManager.chromedriver().setup();
    driver = new ChromeDriver();
}
```

2

ShutterBug



- Selenium Shutterbug is a utility library written in Java for making screenshots using Selenium WebDriver and further customizing, comparing and processing them with the help of Java AWT
- Selenium Screenshots on steroids

2

ShutterBug – Use Cases

- Capturing the entire page, WebElement, entire scrollable WebElement, frame
- Creating thumbnails
- Screenshot customizations:
- Highlighting element on the page, with added text
- Blur WebElement on the page (e.g. sensitive information)
- Blur whole page
- Blur whole page except specific WebElement
- Monochrome WebElement
- Crop around specific WebElement with offsets
- Screenshot comparison (with diff highlighting)

ShutterBug– How to use it?

1

```
// capture entire page
Shutterbug.shootPage(driver, Capture.FULL, true).save();
```

2

```
// blur and annotate
Shutterbug.shootPage(driver)
    .blur(searchBox)
    .monochrome(storeLogo)
    .highlightWithText(storeLogo, Color.blue, 3, "Monochromed logo", Color.blue, new
Font("SansSerif", Font.BOLD, 20))
    .highlightWithText(searchBox, "Blurred secret words")
    .withTitle("Store home page - " + new Date())
    .withName("home_page")
    .withThumbnail(0.7).save();
```

3

```
// image comparison
String baselineFilePath = new File("src/test/resources/baseline_img/first_promo_banner.png")
    .getAbsolutePath();

Assert.assertTrue(Shutterbug
    .shootElement(driver, firstPromoBanner)
    .equalsWithDiff(baselineFilePath, "diff", 0.1));
```

3

Tesseract



- Tesseract OCR is an optical character reading engine originally developed by HP in 1985 and open sourced in 2005. Since 2006 it is developed by Google. Tesseract has Unicode (UTF-8) support and can recognize over 100 languages “out of the box”
- Useful for capturing text from images, barcodes etc.
- **Use with caution!**

Tesseract – How to use it?

```
WebElement promoBanner = driver.findElement(By
    .cssSelector("ul.promos> li:nth-child(1) > a"));

BufferedImage bannerImg = Shutterbug.shootElement(driver, promoBanner).getImage();

Tesseract tesseract = new Tesseract();
tesseract.setDatapath("/usr/local/Cellar/tesseract/4.1.1/share/tessdata/");
tesseract.setLanguage("eng");
String result = tesseract.doOCR(bannerImg).trim();
Assert.assertEquals("HOME & DECOR\nFOR ALL YOUR SPACES", result);
```

4

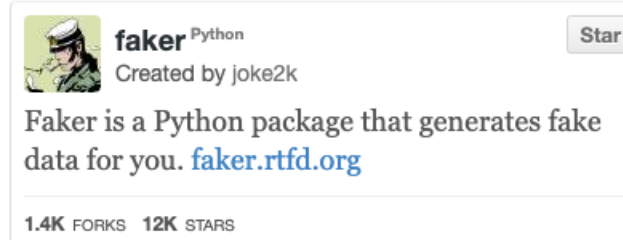
Faker & Friends



java-faker Java
Created by DiUS

Brings the popular ruby faker gem to Java
dius.github.io/java-faker

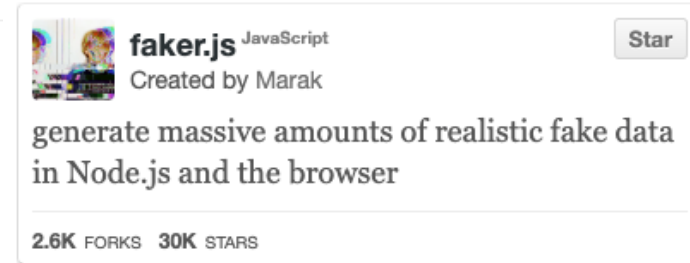
475 FORKS 2.4K STARS



faker Python
Created by joke2k

Faker is a Python package that generates fake data for you. faker.rtfd.org

1.4K FORKS 12K STARS



faker.js JavaScript
Created by Marak

generate massive amounts of realistic fake data in Node.js and the browser

2.6K FORKS 30K STARS

more...

- Faker & friends are set of libraries available in various programming languages to generate fake data for development and testing
- Faker can help in generating test data on the fly instead of manually finding data every time before you run a test
- Faker libraries can generate data for over 100 data domains such as Names, Addresses, Emails etc. in various locales.
- Faker can be extended to support custom data domains

4

Faker & Friends – How to use it?

```
Faker faker = new Faker();  
String firstName = faker.name().firstName();  
String lastName = faker.name().lastName();  
String email = faker.internet().emailAddress();  
String password = "P@ssword";  
String greetings = String.format("Hello, %s %s!", firstName, lastName);
```

5

WireMock



- Wiremock helps in mocking HTTP services. You can stub HTTP responses in JSON/XML for development and testing
- Also known as test doubles or service virtualization
- Wiremock can be used as a library in your Selenium projects or as standalone instance
- There are bunch of other alternative available. Check out my awesome-toolbox page

WireMock – How to use it?

1

```
// Setup and start the Wiremock server
WireMockServer wireMockServer = new WireMockServer(options()
    .port(4000)
    .notifier(new ConsoleNotifier(true)));

wireMockServer.start();
```

2

```
// Define stub for the test
wireMockServer

.stubFor(get(urlEqualTo("/data/2.5/weather?q=Singapore&appid
=undefined&units=metric")))
    .willReturn(aResponse()
        .withStatus(200)
        .withHeader("Content-Type",
"application/json")
        .withBodyFile("json/weather_data.json")));
```

6

PDFBox



- The Apache PDFBox library is an open-source Java tool for working with PDF documents.
- PDFBox allows creation of new PDF documents, manipulation of existing documents and the ability to extract content from documents
- Similar libraries available in other programming languages
- PDFBox can help you testing PDFs
- **Use with caution!**

PDFBox – How to use it?

```
doc = PDDocument.load(file);

Assert.assertEquals(1, doc.getNumberOfPages());
String content = new PDFTextStripper().getText(doc);

Assert.assertTrue(content.contains("PDF Test File"));
```



Demos!

Examples for this session are written in Java and JUnit

Most of these tools have alternate versions available in
other popular programming languages (Python, C#,
Ruby, JavaScript)

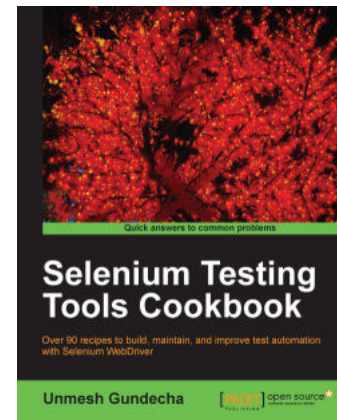
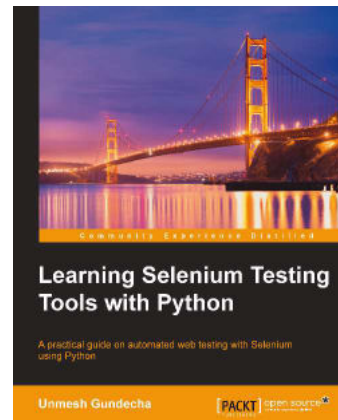
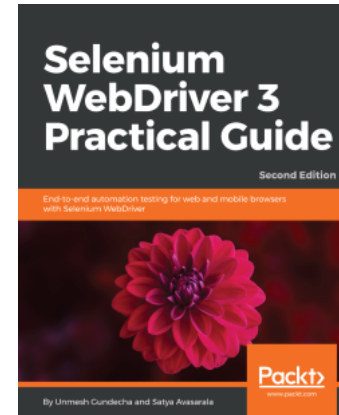
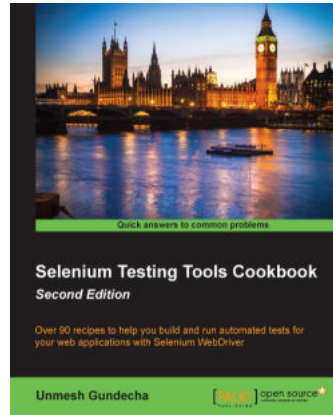
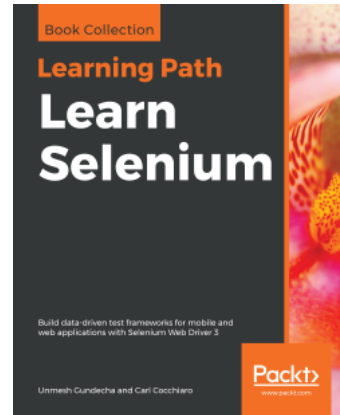
Resources

- Code from this session – <https://github.com/upgundecha/se-powertools-recipes>
- Awesome Toolbox – <https://github.com/upgundecha/awesome-toolbox>
- Awesome Selenium List – <https://github.com/christian-bromann/awesome-selenium>

How to create your Power Toolbox

- Keep looking for libraries & tools in
 - GitHub Explore
 - Package Repositories such as npmjs.org, PyPI (Python Package Index),
rubygems.org
- Create awesome list in your GitHub Repo

My Books & Blog



<https://www.amazon.com/~e/B00ATKDJOA>



Thank you!