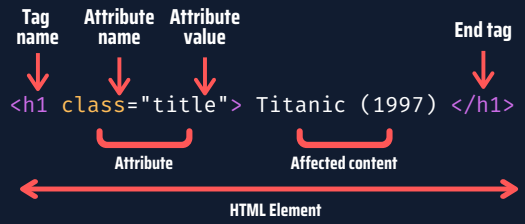
Web Scraping Cheat Sheet

Web Scraping is the process of extracting data from a website. Before studying Beautiful Soup and Selenium, it's good to review some HTML basics first.

HTML for Web Scraping

Let's take a look at the HTML element syntax.

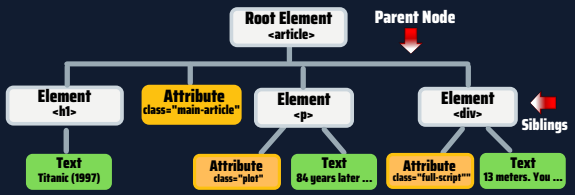


This is a single HTML element, but the HTML code behind a website has hundreds of them.

HTML code example

```
<article class="main-article">
 <h1> Titanic (1997) </h1>
 <p class="plot"> 84 years later ... </p>
 <div class="full-script"> 13 meters. You ... </div>
</article>
```

The HTML code is structured with "nodes". Each rectangle below represents a node (element, attribute and text nodes)



- "Siblings" are nodes with the same parent.
- It's recommended for beginners to use IDs to find elements and if there isn't any build an XPath.

Beautiful Soup

Workflow

Importing the libraries

```
from bs4 import BeautifulSoup
import requests
```

Fetch the pages

```
result=requests.get("www.google.com")
result.status_code # get status code
result.headers # get the headers
```

Page content

```
content = result.text
```

Create soup

```
soup = BeautifulSoup(content,"lxml")
```

HTML in a readable format

```
print(soup.prettify())
```

Find an element

```
soup.find(id="specific_id")
```

Find elements

```
soup.find_all("a")
soup.find_all("a","css_class")
soup.find_all("a",class_="my_class")
soup.find_all("a",attrs={"class":
                         "my_class"})
```

Get inner text

```
sample = element.get_text()
sample = element.get_text(strip=True,
                          separator=' ')
```

Get specific attributes

```
sample = element.get('href')
```

Here are my guides/tutorials and courses
- Medium Guides/YouTube Tutorials
- Web Scraping Course
- Data Science Course
- Automation Course
- Make Money Using Programming Skills

XPath

We need to learn XPath to scrape with Selenium or Scrapy.

XPath Syntax

An XPath usually contains a tag name, attribute name, and attribute value.

```
//tagName[@AttributeName="Value"]
```

Let's check some examples to locate the article, title, and transcript elements of the HTML code we used before.

```
//article[@class="main-article"]
//h1
//div[@class="full-script"]
```

XPath Functions and Operators

XPath functions

```
//tag[contains(@AttributeName, "Value")]
```

XPath Operators: and, or

```
//tag[(expression 1) and (expression 2)]
```

XPath Special Characters

/	Selects the children from the node set on the left side of this character
//	Specifies that the matching node set should be located at any level within the document
.	Specifies the current context should be used (refers to present node)
..	Refers to a parent node
*	A wildcard character that selects all elements or attributes regardless of names
@	Select an attribute
()	Grouping an XPath expression
[n]	Indicates that a node with index "n" should be selected

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Selenium 4

Note that there are a few changes between Selenium 3.x versions and Selenium 4.

Import libraries:

```
from selenium import webdriver
from selenium.webdriver.chrome.service import Service

web="www.google.com"
path='introduce chromedriver path'
service = Service(executable_path=path)  # selenium 4
driver = webdriver.Chrome(service=service)  # selenium 4
driver.get(web)
```

Note:

```
driver = webdriver.Chrome(path)  # selenium 3.x
```

Find an element

```
driver.find_element(by="id", value="...")  # selenium 4
driver.find_element_by_id("write-id-here")  # selenium 3.x
```

Find elements

```
driver.find_elements(by="xpath", value="...")  # selenium 4
driver.find_elements_by_xpath("write-xpath-here")  # selenium 3.x
```

Quit driver

```
driver.quit()
```

Getting the text

```
data = element.text
```

Implicit Waits

```
import time
time.sleep(2)
```

Explicit Waits

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

WebDriverWait(driver, 5).until(EC.element_to_be_clickable((By.ID, 'id_name')))
# Wait 5 seconds until an element is clickable
```

Options: Headless mode, change window size

```
from selenium.webdriver.chrome.options import Options
options = Options()
options.headless = True
options.add_argument('window-size=1920x1080')
driver=webdriver.Chrome(service=service,options=options)
```

Scrapy

Scrapy is the most powerful web scraping framework in Python, but it's a bit complicated to set up, so check my guide or its documentation to set it up.

Creating a Project and Spider

To create a new project, run the following command in the terminal.

```
scrapy startproject my_first_spider
```

To create a new spider, first change the directory.

```
cd my_first_spider
```

Create an spider

```
scrapy genspider example example.com
```

The Basic Template

When you create a spider, you obtain a template with the following content.

```
import scrapy
class ExampleSpider(scrapy.Spider):
    name = 'example'
    allowed_domains = ['example.com']
    start_urls = ['http://example.com/']

    def parse(self, response):
        pass
```

Class

Parse method

The class is built with the data we introduced in the previous command, but the parse method needs to be built by us. To build it, use the functions below.

Finding elements

To find elements in Scrapy, use the response argument from the parse method

```
response.xpath('//tag[@AttributeName="Value"]')
```

Getting the text

To obtain the text element we use text() and either .get() or .getall(). For example:

```
response.xpath('//h1/text()').get()
response.xpath('//tag[@Attribute="Value"]/text()').getall()
```

Return data extracted

To see the data extracted we have to use the yield keyword

```
def parse(self, response):
    title = response.xpath('//h1/text()').get()

    # Return data extracted
    yield {'titles': title}
```

Run the spider and export data to CSV or JSON

```
scrapy crawl example
scrapy crawl example -o name_of_file.csv
scrapy crawl example -o name_of_file.json
```