selenium

21 July 2023 21:48

Selenium offfical website:
https://www.selenium.dev/

Selenium Webdriver:
- One of its component
- It is a module
  - Firefox driver--->Firefox()
  - Chrome Driver ----> Chrome()
  - Edge---> Edge()
- It is a api (application programming interface) why webdriver is api?

Understanding web layers

1) GUI/UI or presentation layer- GUI testing
2) Application server- contains all business logic- api tetsing
3) Database layer- backend layer-database testing

Why webdriver is API?

Automation code -> webdriver -> Application open in browser

Webdrivers contains classes method so we are refering those in our automation. Job of webdriver to understand our code and interact with browser.
That's why we are calling webdriver is an api

Selenium 3.x
Selenium client lib or selenium language binding
Selenium client library(java/python/ruby) ---json wire protocol over http-->webdrivers--->w3c proto-->browsers
- Not stable

Selenium 4.x
Selenium client library(java/python/ruby) ---w3c protocol-->webdrivers--->w3c proto-->w3c proto-->btrowsers
- Stable and all over architure uses same poto
- Webdrivers are developed by brower companies
- Refer(offical website)

Setup and installation:
- Install python latest version -Welcome to Python.org
- Install pycharm -Get Your Educational Tool - JetBrains

Download webdrivers
Chrome -https://googlechromelabs.github.io/chrome-for-testing/
Firefox- https://github.com/mozilla/geckodriver/releases/download/v0.33.0/geckodriver-v0.33.0-win-aarch64.zip
Edge- https://developer.microsoft.com/en-us/microsoft-edge/tools/webdriver/

Selenium4 python documentation
https://www.selenium.dev/selenium/docs/api/py/api.html
https://selenium-python.readthedocs.io/

Starting with selenium

- Open browser
  Webdriver.Chrome(executable_path="")
  Webdriver.Chrome()

  Webdriver.Chrome(service=Srevice("E:\selenium\drivers\chromedriver.exe"))

https://pypi.org/project/webdriver-manager/

```
pip install webdriver-manager
```

Use with Chrome

```
# selenium 3
from selenium import webdriver
from webdriver_manager.chrome import ChromeDriverManager

driver = webdriver.Chrome(ChromeDriverManager().install())
```

```
# selenium 4
from selenium import webdriver
from selenium.webdriver.chrome.service import Service as ChromeService
from webdriver_manager.chrome import ChromeDriverManager

driver = webdriver.Chrome(service=ChromeService(ChromeDriverManager().install()))
```

Locators

Identify various elements in the locators

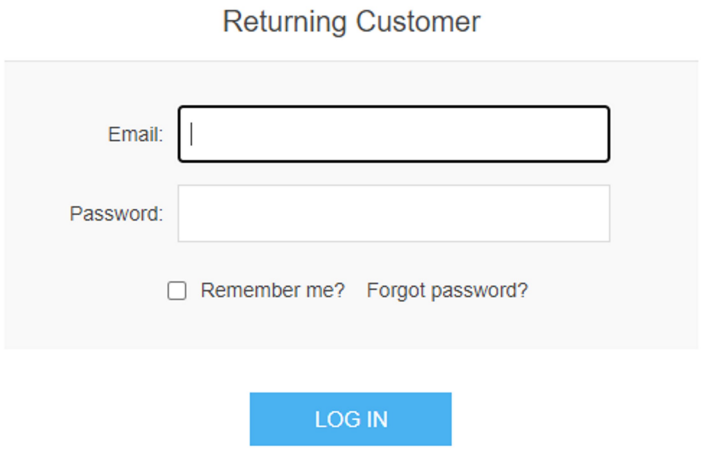
Normal locators - can be taken from xml page

- ID-unique-fastest
- Name-unique
- Linktext/partialtext- unique
- Classname- to find more than element
- tagname- to find more than element

Customized locators- can be written or generated from the tool, can write our own xpath

- Css selector
  - Tag/id
  - Tag/class
  - Tag/attr
  - Tag/class/attr
- Xpath
  - Absolute
  - relative

Understanding Basic html structure




```
<div class="form-fields"> == $0
  <div class="inputs">
    <label for="Email">Email:</label>
    <input class="email" autofocus type="email" data-val="true" data-val-email="Wrong email" data-val-required="Please enter your email" id="Email" name="Email">
    <span class="field-validation-valid" data-valmsg-for="Email" data-valmsg-replace="true"></span>
    ::after
  </div>
  <div class="inputs">
    <label for="Password">Password:</label>
    <input class="password" type="password" id="Password" name="Password">
    <span class="field-validation-valid" data-valmsg-for="Password" data-valmsg-replace="true"></span>
    ::after
  </div>
  <div class="inputs reversed">...</div>
</div>
<div class="buttons">
  <button type="submit" class="button-1 login-button">Log in</button>
</div>
<input name="__RequestVerificationToken" type="hidden" value="CfDJ8Jtw2KziYYJGnXbyZNE5L9QvglyADTpbULL-v1nqaAmfIQ2XhRtMOpBZxW-r8Tlv2NvjvzCdlOJW044PzXnZdpgO46VGVL1PbghBuXSFM0fKDpnSyVHTFW-d1hxhd16WZQJ92k12DVISzqzuaYNz3bA">
<input name="RememberMe" type="hidden" value="false">
</form>
</div>
</div>
<div class="external-authentication"></div>
```

<input class="email" autofocus=""
type="email"
data-val="true"
data-val-email="Wrong email"
data-val-required="Please enter your email" id="Email" name="Email">

- Input---> tag
- Class---> attr
- "email"--> value

- Tag for image---> img
- Tag for link---> a(anchor tag)---common tag=href hyperlink_reference

Css selector:(tagname is optional)

- Tag/id----(syntax: tag#valueofid)-----input#email---->without tag #email
- Tag/class---synatx: tag.valueofclass-----input.email--->without tag .email
- Tag/attr----synatx: tag[attr=value]----input[data-val=true]---double quotes is optional for value --a[type=button] --withouttag[type=button]
- Tag/class/attr----synatx: tag.valueofclass[attr=value]----input.email[data-val=true]

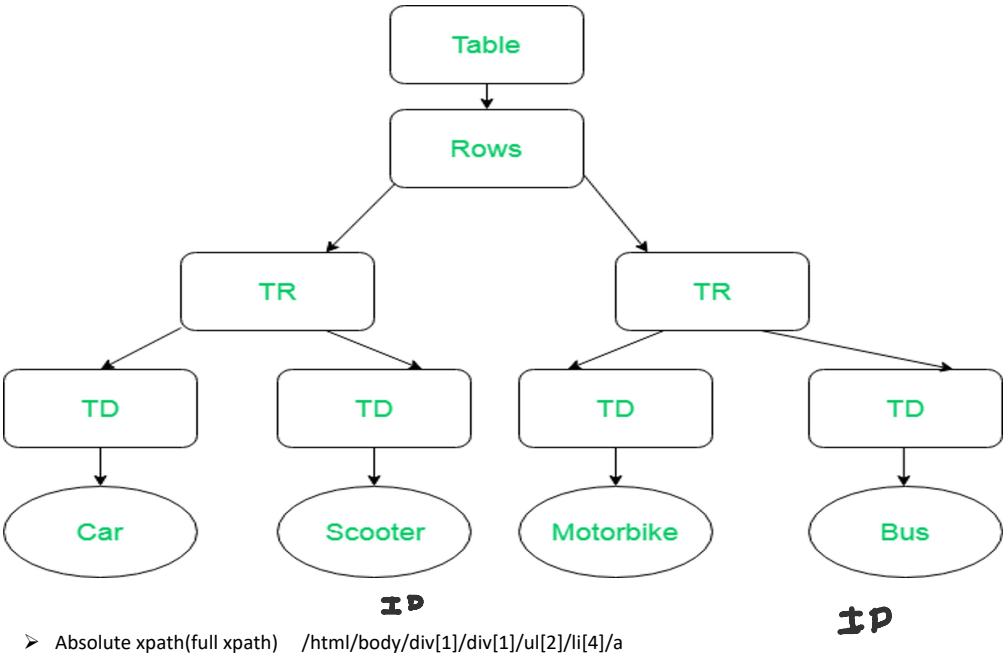
XPATH:

- -Xml path
- Syntax / language for finding any element on the webpage
- Finds the location of the element in the page using html DOM structure

- Xpath can be used to navigate through the elements and attribute in DOM structure
- Xpath is an address of the element

DOM is a API interface provided by the browser, when a webpage is loaded browser creates a document object model

```
<table>
    <tbody>
        <tr>
            <td>Car</td>
            <td>Scooter</td>
        </tr>
        <tr>
            <td>MotorBike</td>
            <td>Bus</td>
        </tr>
    </tbody>
</table>
```



- Absolute xpath(full xpath) /html/body/div[1]/div[1]/ul[2]/li[4]/a
- Relative xpath(partial xpath) //*[@id="userProfileId"]/a

Difference betwn absolute and relative xpath

abs xpath starts from root html node	Rlt xpath directly jumps to element on the dom
/	//
Uses Tags/nodes	Uses attributes

How to write own xpath?

- Abs xpath. Strat from bottom to top
  /html/body/div[1]/div[1]/ul[2]/li[4]/a
- Rlt xpath- //tagname[@attr="value"]
  //input[@id="email"] or //*[@id="email"]

Using tools we can automatically capture autmatically

- Firebug/firepath---firefox ---deprecated /not available due to security reasons
- Rightclk element-> inspect->hightlight html node--> right click--copy path(to check xpath crtl+f)
- Chropath (https://chromewebstore.google.com/detail/chropath/ljngjbnaijcbncmcnjfhigebomdlkcjo?pli=1)
- Selector hub

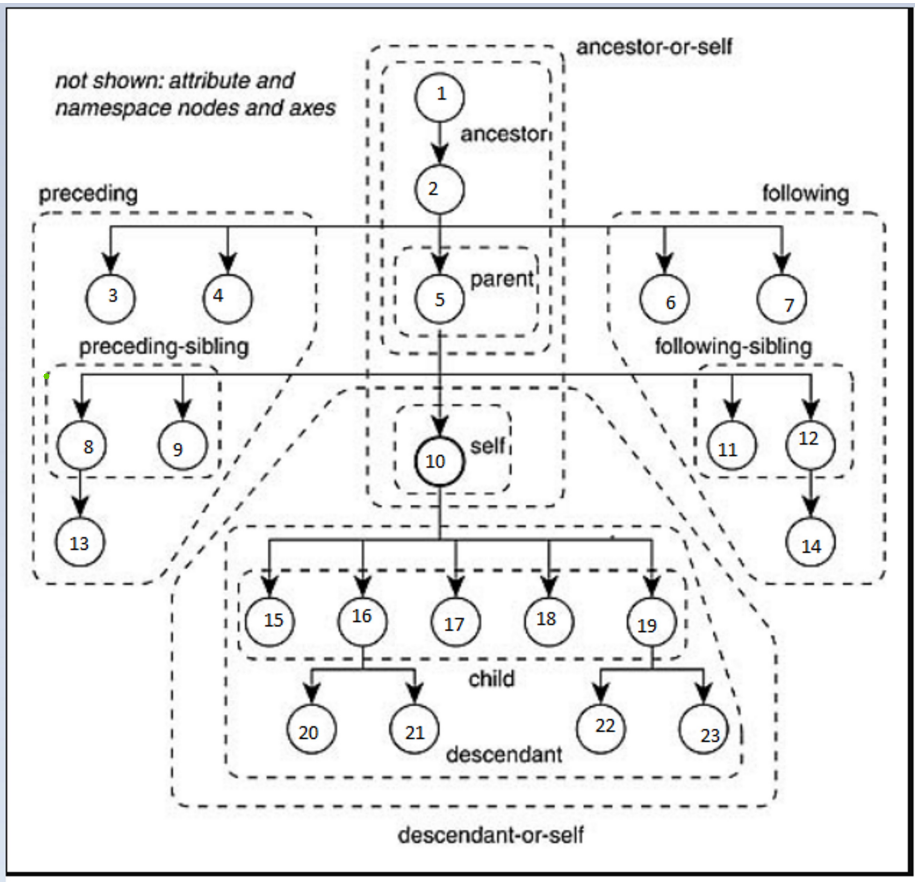
Xpath options:
Eg:<input class="email" autofocus="" type="email" data-val="true" data-val-email="Wrong email" data-val-required="Please enter your email" id="Email" name="Email">

- Or --------->//input[@id="email" or @data-val="true"]
- And----->//input[@id="email" and @data-val="true"]
- ** Contains()---->
  When button id is changing.id-"start" and id="stop"
  //*[contains(@id,st)]

- //a[contains(text(),'Rajasthan Cylinders')]
- ** starts-with()
  //*[starts-with(@id,st)]
  //span[starts-with(@id,'servi_name')]
  Also Works with contains operator
- **Ends-with()(works only with xpath 2.0 version)
- Text()
  //tag[text()=">innertext<"]

Xpath axes: (traverse top to bottom or bottom to top)

- Self
- Parent
- Child
- Ancestor
- Descendent
- Following
- Following-sibling
- Preceding
- Preceding-sibling
- Ancestor-or-self
- Descendent-or-self



AxisName	Result	
child	Selects all children of the current node	//*[attr='value']/child::tagname
parent	Selects the parent of the current node	//*[attr='value']/parent::tagname
ancestor	Selects all ancestors (parent, grandparent, etc.) of the current node	//*[attr='value']/ancestor::tagname
descendant	Selects all descendants (children, grandchildren, etc.) of the current node	//*[attr='value']/descendant::tagname
following	Selects everything in the document after the closing tag	//*[attr='value']/following::tagname

	the current node	
following	Selects everything in the document after the closing tag of the current node	//*[attr='value']/following::tagname
preceding	Selects all nodes that appear before the current node in the document, except ancestors, attribute nodes and namespace nodes	//*[attr='value']/preceding::tagname
following-sibling	Selects all siblings after the current node	//current html tag[@attr='value']/following-sibling::sibling tag[@attr='value']
preceding-sibling	Selects all siblings before the current node	//current html tag[@attr='value']/preceding-sibling::previous tag[@attr='value']
self	Selects the current node	//*[attr='value']/self::tagname

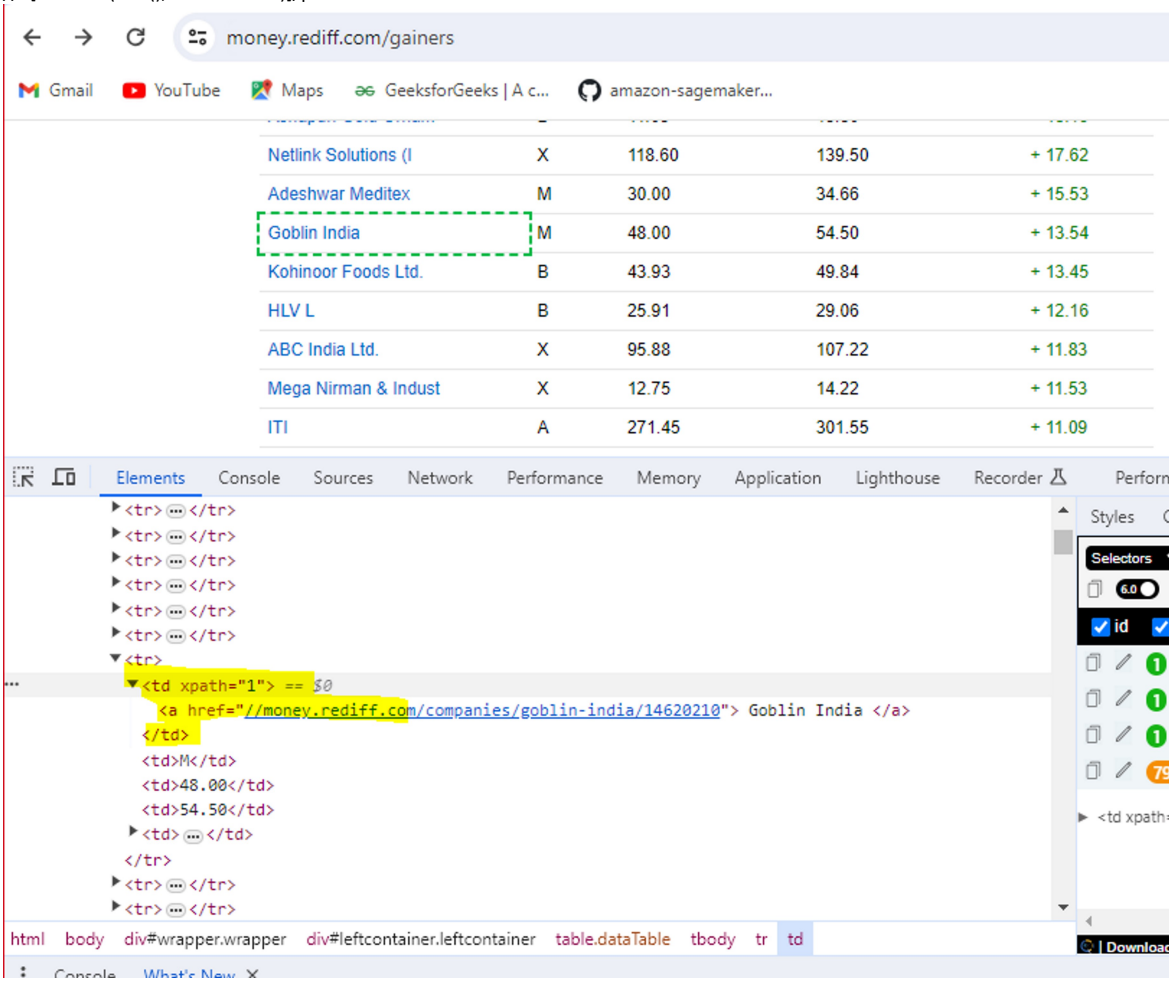
https://money.rediff.com/gainers/nse

self

//a[text()="Topic-wise Practice"]/self::a

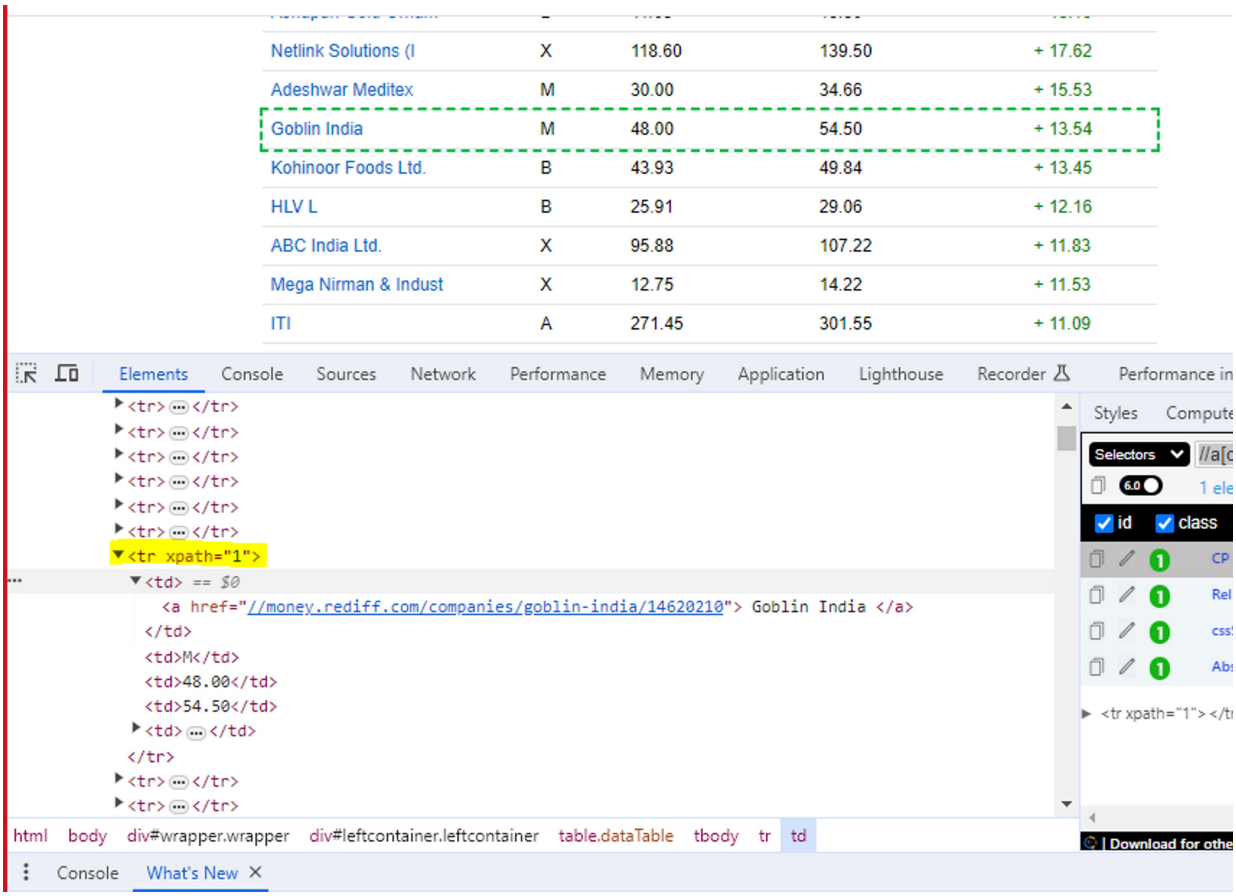
Parent

//a[contains(text(),'Goblin India')]/parent::td



child
//a[contains(text(),'Heritage Foods')]/ancestor::tr/child::td

ancestor
//a[contains(text(),'Goblin India')]/ancestor::tr



Desendents

//a[contains(text(),'Heritage Foods')]/ancestor::tr/descendant::td

following
//a[contains(text(),'Heritage Foods')]/ancestor::tr/following::td

Preceding
//a[contains(text(),'Heritage Foods')]/ancestor::tr/preceding::tr

Preceding sibling

//a[contains(text(),'Goblin India')]/ancestor::tr/td[3]/preceding-sibling::td
//a[contains(text(),'Goblin India')]/ancestor::tr/td[3]/following-sibling::td
//a[contains(text(),'Goblin India')]/ancestor::tr/td[3]/preceding::td
//a[contains(text(),'Goblin India')]/ancestor::tr/td[3]/following::td
//a[contains(text(),'Heritage Foods')]/ancestor-or-self::tr

//table[@class='dataTable']/tbody/tr[8]/td[3] (or) //a[contains(text(),'Goblin India')]/ancestor::tr/td[3]

findelement VS findelements:

Findelement //ul[@id="hslider"]//a[contains(text(), "Python")]	**Findelements** //ul[@id="hslider"]//a
With locator matching single web element Returns single web element	With locator matching single web element Returns single web elements in list
With locator matching multiple web elements Matches with first element and returns that elem	With locator matching multiple web elements Returns multiple web elements in list
NoSuchElementException error	Will not throw an exceptions. returns a empty list
Clear()	Clears the text in the input box [eg:https://www.makemytrip.com/]

Text	Will not Return the text in the input box. This method will work only on innertext. To get inner text Mostly linktext will have innertext.
Get_atrribute()	Returns the text in the input box. Returns value of any attribute.
What is Innertext?	value between > < tag <button type="submit" class="button-1 login-button">Log in</button>

Example:

```
#getthetexttypedintheinputboxtextvsget.attribute()
importtime

fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj)
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()

driver.find_element(By.XPATH,'//*[@id="gcse-form"]/button/i').click()
google_search=driver.find_element(By.XPATH,'//*[@id="gcse-search-input"]')
google_search.send_keys("selenium")
print("usingtextmethod:",google_search.text)
print("usinggetattributemethod:",google_search.get_attribute("value"))

time.sleep(10)
driver.find_element(By.XPATH,'//*[@id="gcse-search-input"]').clear()
google_search.send_keys("python")

print("Afterclearingtext...")
print("usingtextmethod:",google_search.text)
print("usinggetattributemethod:",google_search.get_attribute("value"))
```

Example2:

```
#getthetexttypedintheinputboxtextvsget.attribute()
importtime

fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj)
driver.get("https://www.facebook.com/")
driver.maximize_window()

#driver.find_element(By.XPATH,'//*[@id="gcse-form"]/button/i').click()
google_search=driver.find_element(By.XPATH,'//input[@id="email"]')
google_search.send_keys("selenium")
print("usingtextmethod:",google_search.text)
print("usinggetattributemethod:",google_search.get_attribute("value"))

driver.find_element(By.XPATH,'//input[@id="email"]').clear()
google_search.send_keys("python")

print("Afterclearingtext...")
print("usingtextmethod:",google_search.text)
print("usinggetattributemethod:",google_search.get_attribute("value"))
```

Selenium Commands:

- Application Commands

  Works only after opening the browser. Throws error if the browser not opened
  - .tittle - capture title of current page
  - .current_url - capture current url
  - .page_source - caputre source code of the page
  - .get() - opens application url

Example:

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
```

```
driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()
print(f"title:{driver.title}")
print(f"currenturl:{driver.current_url}")
print(f"pagesource:{driver.page_source}")
```

- Conditional commands
  Returns true when the below condition satisfied
    Is_displayed()
    Is_enabled()---->
    Is_selelcted()---> checkbox, radio buttons---> works only for inputtags

Example:

```
#is_displayed()is_enabled()is_selected()

importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()
driver.implicitly_wait(10)
#is_displayed()
sign_elem=driver.find_element(By.XPATH,'//*[@id="userProfileId"]/a')
print(sign_elem.is_displayed())
sign_elem.click()

remember_elem=driver.find_element(By.XPATH,'//input[@name="rem"and@type="checkbox"]')
print(remember_elem.is_selected())
print(remember_elem.is_enabled())
remember_elem.click()
print(remember_elem.is_selected())
```

- Browser Commands

Driver.close()	Driver.quit()
For single page - closes the browser	Closes the page and quits the browers
Internally - Backend process will continue to run	Ensures Backend Process will be killed
For multiple page- closes the one page (ie) parent window mostly (driver focused)	Closes all the page and quits the browser

Example:

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()

elem_cookie=driver.find_element(By.XPATH,'//button[@class="consent-btn"]')
ifelem_cookie.is_displayed():
elem_cookie.click()
driver.find_element(By.XPATH,'//*[@id="RA-root"]/a/span').click()

time.sleep(10)

#driver.close()#driverfocusedonlygetclosed

driver.quit()#allprocesswillalsogetkilled
```

- Navigator commands

.back()
.forward()
.refresh()

Example:

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()
print(f"title:{driver.title}")
print(f"currenturl:{driver.current_url}")
#print(f"pagesource:{driver.page_source}")
driver.get("https://www.facebook.com/")
driver.back()
driver.refresh()
driver.forward()
```

- Wait Commands
  - To solve Synchronization problem - no sync btwn code and browser
  - Implicit wait
  - Explicit wait
  - Time.sleep()----related to python

Time.sleep()--->

Static/hard coding the timing/ poor performance
Need to mention every time when the wait for element required
If the element is available within the time it will wait upto the time mention in the function
If the element is not available with in the time it illl not find the element script will fail

Implicit wait------>

Driver.implicitly_wait(<time in sec>)

Act as wait until element found. Applies for overall script.
If the element found within the time limit it will pass on to the next line in the script. Good performance
Demerit: if the element is not seen within the time it will throw the error.

Explicit wait--->

Works based on condition(presence_of_element_located)

Need to create separate class

From selenium.webdriver.support.
Wait_obj=webdriver.WebDriverWait(driver_obj,
<time>,
<ignore_exception=[exeptions to be ignored]>,
<poll_frequency=2>----> polls every 2 sec, checks every 2 sec interval

)----declaration

And use the wait_obj in script where explicit wait needed

From selenium.webdriver import expected condition as EC
Wait_obj.until(EC.<conditions ie element to be located>(<locator>))---no need of find element

Returns the element and perform the action

What if the condition not satisfied? - If the element is not satisfied it will wait until the time set during wait_obj creation

Explicit works based on element. Have to insert in script wherevere the wait is needed.

```
fromseleniumimportwebdriver
fromselenium.webdriverimportActionChains
fromselenium.webdriver.chrome.serviceimportService
```

```
fromtimeimportsleep
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.supportimportexpected_conditions
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.common.exceptionsimport*

service_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=service_obj)
driver.get("https://money.rediff.com/gainers")
driver.maximize_window()
#driver.implicitly_wait(300)
driver.find_element(By.XPATH,"//a[contains(text(),'SiyaramRecyclingIn')]").click()

wait_obj=WebDriverWait(driver,60,2,ignored_exceptions=[NoSuchElementException,TimeoutException])

wait_obj.until(expected_conditions.visibility_of_element_located((By.XPATH,"//*[@id='for_BSE']/h1")))
#wait_obj.until(expected_conditions.alert_is_present())
wait_obj.until(expected_conditions.presence_of_all_elements_located((By.XPATH,"//span")))#worksonlywithxpathmatchesmultipleel
em

print(driver.find_element(By.XPATH,"//*[@id='for_BSE']/h1").text)

sleep(10)
```

Working with different types of elements:

- **Handling Checkboxes.(**https://itera-qa.azurewebsites.net/home/automation**)**

  Select specific checkbox---> get locator of specifi check box and click
  Select all check box---------> get all elem in list and click. Use xpath that finds multiple element in list and access using for loop [using individual elements, using index]

  To select single and multiple check box use xpath condtion or python comdition
  Clear check_box also uses click method before that we need to check condition is_selected() to make sure all the check box are cleared

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://itera-qa.azurewebsites.net/home/automation")
driver.maximize_window()

#radio_btn_elem=driver.find_element(By.CSS_SELECTOR,'input#female')
#radio_btn_elem.click()
#print(radio_btn_elem.is_selected())

#checkboxtoselectoneelement
#checkbox_elem=driver.find_element(By.CSS_SELECTOR,'input#sunday')
#checkbox_elem.click()
#print(checkbox_elem.is_selected())

#toselectallcheckbox
checkbox_elems=driver.find_elements(By.XPATH,'//*[contains(@id,"day")]')
print(len(checkbox_elems))

forelemincheckbox_elems:
ifnotelem.is_selected():
elem.click()


forelemincheckbox_elems:
print(elem.is_selected())
```

- Links.
  Internal - nav in same page/page open internally
  External - nav to other page

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait___
```

```
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()
print(driver.title)
#driver.find_element(By.LINK_TEXT,"InterviewPreparation").click()
#print(driver.title)
driver.find_element(By.LINK_TEXT,"Communityishere").click()
print(driver.title)

#driver.quit()
```

broken links - future devolepment dev place the links in webpage

Deadlinkcity.com---> brokenlinks
Broken links returns error codes- which ever links are giving error codes are brokenlinks.
Request module is requird for checking broken links

```
http://www.domaindoesnot.exist/
Traceback (most recent call last):
  File "C:\Users\user\AppData\Local\Programs\Python\Python38\lib\site-packages\urllib3\connection.py", line 174, in
_new_conn
    conn = connection.create_connection(
  File "C:\Users\user\AppData\Local\Programs\Python\Python38\lib\site-packages\urllib3\util\connection.py", line 72,
in create_connection
    for res in socket.getaddrinfo(host, port, family, socket.SOCK_STREAM):
  File "C:\Users\user\AppData\Local\Programs\Python\Python38\lib\socket.py", line 918, in getaddrinfo
    for res in _socket.getaddrinfo(host, port, family, type, proto, flags):
socket.gaierror: [Errno 11001] getaddrinfo failed
```

1) Get the brokenlink from href using get_arrtibute() method
2) Use res=request.head(url)
3) Res.status_code()>=400:
4) Return bad url

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("http://www.deadlinkcity.com/")
driver.maximize_window()
print(driver.title)

driver.find_element(By.LINK_TEXT,"Errorcode401").click()
print(driver.title)

#driver.quit()
```

4 req method
aut

- **Dropdown**

  How to select value from dropdown:
  Mostly stated with select tag---option tag
  Dropdown is a webelement inthat all the opions are also webelemet
  We have select method in python.

  a. Get the locator of drop down use find_element
  b. Select() class(

  Drp_country_ele= driver.find_element()

  Drop_county=Select(Drp_country_ele)
  Dropcountry.select_by_visible_text("pass_the text")
  Drpcountry.Select_by_value("attribute of option")
  Drpcountry.select_by_index("index_number")

  Returns all the options element

Drpcountry.options
Use the for loop to access the options

Without using buildin function how to select dropdown?

```
Alloption=Drpcountry.options
For opt in alloption:
    If opt.text == "name":
        Opt.click()
        Break
```

Works only for select tag. If not select tag …use the findelement of all options and creatte thefunc with click method.

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.support.selectimportSelect
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://itera-qa.azurewebsites.net/home/automation")
driver.maximize_window()

drop_down_elem=driver.find_element(By.XPATH,'//*[@class="custom-select"]')
options_elem=Select(drop_down_elem)


options_elem.select_by_visible_text("Italy")
options_elem.select_by_index("5")
options_elem.select_by_value("3")
print(options_elem.options)

#driver.quit()
```

Switch to commands

Alerts or pop up windows:

https://the-internet.herokuapp.com/javascript_alerts
https://mypage.rediff.com/

1) Can get text from alert box
2) Give input
3) Ok and cancel button

Driver.switch_to.alert

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.support.selectimportSelect
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://the-internet.herokuapp.com/javascript_alerts")
driver.maximize_window()

driver.find_element(By.XPATH,"//button[contains(text(),'ClickforJSPrompt')]").click()
time.sleep(5)
alert_window=driver.switch_to.alert
print(alert_window.text)
alert_window.send_keys("welcome")
#alert_window.accept()#---->clicksopen
alert_window.dismiss()#--->cancel

#driver.quit()
```

Frames or Iframes

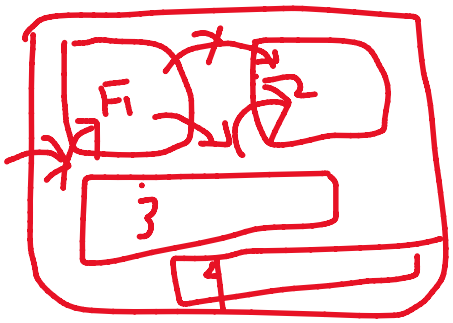
https://www.selenium.dev/selenium/docs/api/java/index.html?overview-summary.html

Tags for frame	------> frame/iframe/form
To get total number of frames	Use ctrl+f in dev tool

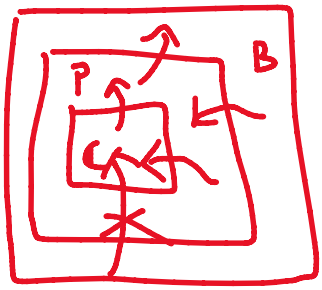
1) Driver.switch_to_frame() # selenium3
2) driver.switch_to.frame() #selenium4

pass name,id,frameaswebelement
switch_to.frame(name of the frame)
switch_to.frame(id of the name)
switch_to.frame(webelement)
switch_to.frame(o)--Index

driver.switch_to.default_content()---- contols comes to main page

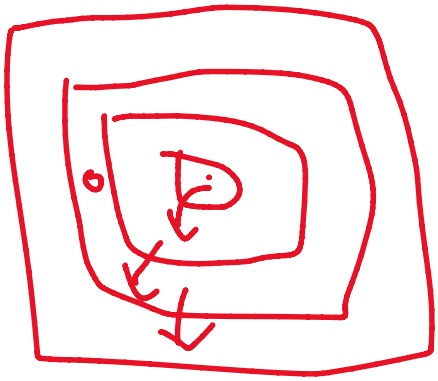



```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.support.selectimportSelect
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://www.selenium.dev/selenium/docs/api/java/index.html?overview-summary.html")
driver.maximize_window()

#framesoriframes

driver.switch_to.frame('packageListFrame')
driver.find_element(By.LINK_TEXT,'org.openqa.selenium').click()
driver.switch_to.default_content()

driver.switch_to.frame('packageFrame')
driver.find_element(By.LINK_TEXT,'WebDriver').click()
driver.switch_to.default_content()

driver.switch_to.frame('classFrame')
driver.find_element(By.XPATH,'//ul[@class="navList"]/li/a[contains(text(),"Help")]').click()
driver.switch_to.default_content()
#driver.quit()
```



Innerframes:
https://demo.automationtesting.in/Frames.html
https://ui.vision/demo/webtest/frames/

driver.switch_to.parent_frame() ----> control goes to parent frame




```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.waitimportWebDriverWait
fromselenium.webdriver.support.selectimportSelect
fromselenium.webdriver.supportimportexpected_conditionsasEC

driver=webdriver.Chrome()
driver.get("https://ui.vision/demo/webtest/frames/")
driver.maximize_window()

#framesoriframes
frame_elem=driver.find_element(By.XPATH,'//frameset/frameset/frame[2]')
driver.switch_to.frame(frame_elem)
print(driver.find_element(By.XPATH,'//input[@name="mytext3"]').send_keys("reachedframe3"))
print(driver.find_element(By.XPATH,'//p').text)

inner_frame=driver.find_element(By.XPATH,'/html/body/center/iframe')
```

```
driver.switch_to.frame(inner_frame)
print(driver.find_element(By.XPATH,'//div[@class="ahS2Le"]/div').text)

driver.switch_to.parent_frame()
driver.find_element(By.XPATH,'//input[@name="mytext3"]').clear()
driver.find_element(By.XPATH,'//input[@name="mytext3"]').send_keys("reachedframe3again")
print(driver.find_element(By.XPATH,'//input[@name="mytext3"]').get_attribute("value"))
```

- **Handle windows**

  Windows are handles based on window id
  Window ids are generated by browser

```
driver.switch_to.window(windowid)
driver.current_window_handle--->retunscurrentwindows
driver.window_handles--->returnsmultiplewindows
```

https://www.myntra.com/tops

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj)
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()

driver.find_element(By.LINK_TEXT,'Communityishere').click()
driver.find_element(By.LINK_TEXT,'Communityishere').click()


print(driver.current_window_handle)
print(driver.window_handles)

forhandleindriver.window_handles:
driver.switch_to.window(handle)
print(driver.title)
if"Community"indriver.title:
driver.close()
```

Authentication pop ups-
https://the-internet.herokuapp.com/basic_auth
(admin/admin)

we don't have webelement
Inject username password- syntax

1) Using url----> this is called bypassing the alert

   Syntax

   http://username:password@url

   https://admin:admin@the-internet.herokuapp.com/basic_auth

2) Using autoit-install pyautoit -

```
Pip install pyautoit
```

```
importtime

fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
importautoit

driver=webdriver.Chrome()
driver.get("https://the-internet.herokuapp.com/basic_auth")
driver.maximize_window()
```

```
time.sleep(5)

autoit.win_wait_active("",30)
autoit.send("admin{TAB}")
autoit.send("admin{Enter}")
```

a. To learn more on autoit refer below links

https://www.autoitscript.com/autoit3/docs/

https://github.com/jacexh/pyautoit/tree/master

1) Allow popup (Whatmylocation.com)

```
Ops=webdriver.ChromeOptions
Ops.add_arguments("--disable--notifications")
…
Driver=wedriver.Chrome(service=serv_obj, options=ops)
```

https://chromedriver.chromium.org/capabilities
https://peter.sh/experiments/chromium-command-line-switches/

- **Webtable**
  - Static - data are same()
  - Dynamic - data updated every time(https://money.rediff.com/gainers/bse/daily/group)

Tags for table is /table/tbody (repr whole body)
/table/thead (repr whole header)

Tr---> table row
Th---> table header available in first row
Td---> table data

- Count number of row and col
- Read row col
- Read all row col
- Read row col based on condition

```
#Webtables

importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

driver=webdriver.Chrome()
driver.get("https://money.rediff.com/gainers")
driver.maximize_window()

#findingnumberofrowsandcol
no_of_row=driver.find_elements(By.XPATH,'//table[@class="dataTable"]/tbody/tr')
no_of_col=driver.find_elements(By.XPATH,'//table[@class="dataTable"]/tbody/tr[1]/td')
print(f"rows:{len(no_of_row)}\ncoloumns:{len(no_of_col)}")

#readspecificrowandcoloumdata
#data=driver.find_element(By.XPATH,'//table[@class="dataTable"]/tbody/tr[100]/td[1]').text
#print(data)

#readallrowandcoldata
#print("Printingallrowandcoloumdata")

#forrinrange(1,len(no_of_row)+1):
#forcinrange(1,len(no_of_col)+1):
#data=driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[{c}]').text
#print(data,"\t")
#print("***************")


#readdatabasedoncondition
#getallinfoofCLIOInfotech
```

```
"""forrinrange(1,len(no_of_row)+1):
stock_name=driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[1]').text
ifstock_name=="CLIOInfotech":
#togetspecificdetialmetioncorrectindex
#print(driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[1]').text)
#print(driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[4]').text)



#togetalldetialinthatspecificstoc
forcinrange(1,len(no_of_col)+1):
print(driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[{c}]').text,end="\t")
break"""

#getallinfoofstockwhichcurrentpriceislessthan10

forrinrange(1,len(no_of_row)+1):

stock_current_price=float(
driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[4]').text.replace(",",""))

#print(type(stock_current_price))

ifstock_current_price<=10:

forcinrange(1,len(no_of_col)+1):
print(driver.find_element(By.XPATH,f'//table[@class="dataTable"]/tbody/tr[{r}]/td[{c}]').text,end="\t")

print("\n")

driver.close()
```

- **Save screenshot**

  Takes screenshot of the webpage - useful at the time of failure

```
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy

driver=webdriver.Chrome()
driver.get("https://money.rediff.com/gainers")
driver.maximize_window()
driver.save_screenshot("./webtables.png")
driver.close()
```

```
import time
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.common.by import By

driver=webdriver.Chrome()
driver.get( https://money.rediff.com/gainers)
driver.maximize_window()
#driver.save_screenshot("./webtables.png")
#driver.save_screenshot(r"C:\Users\JS327941\Desktop\webtables.png")
driver.save_screenshot_as_png()# save as png format
driver.save_screenshot_as_base64()# save as binary format
driver.close()
```

- **Mouse Actions**
  - Mouse hover
  - Right click
  - Double click
  - Drag and drop

1) Mouse Hover

```
fromselenium.webdriverimportActionChains
action=ActionChains(driver_obj)
move_to_element(<web driver>)
```

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriverimportActionChains
```

```
driver=webdriver.Chrome()
driver.get("https://www.geeksforgeeks.org/")
driver.maximize_window()

courses_elem=driver.find_element(By.XPATH,'//ul[@class="header-main__list"]/li/span[contains(text(),"Courses")]')
course1_elem=driver.find_element(By.XPATH,'//ul[@class="mega-dropdown"]/li/span[contains(text(),"ForWorkingProfessionals")]')
course2_elem=driver.find_element(By.XPATH,'//ul[@class="mega-dropdown"]/li/ul/li/a[text()="DevOps(Live)"]')

action=ActionChains(driver)

#Mousehover
action.move_to_element(courses_elem).move_to_element(course1_elem).move_to_element(course2_elem).click().perform()
print(driver.title)
driver.quit()
```

2) Right click----context_click(rclk_elem)
3) Double click----double_click(dclk_elem)

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriverimportActionChains

driver=webdriver.Chrome()
driver.get("https://demo.guru99.com/test/simple_context_menu.html")
driver.maximize_window()

rclk_elem=driver.find_element(By.XPATH,'//*[@id="authentication"]/span')
paste_elem=driver.find_element(By.XPATH,'//*[@id="authentication"]/ul/li[4]')
dclk_elem=driver.find_element(By.XPATH,'//*[@id="authentication"]/button')

action=ActionChains(driver)

#rightclick
action.context_click(rclk_elem).context_click(paste_elem).perform()
alert=driver.switch_to.alert
print(alert.text)
alert.accept()

#doubleclick
action.double_click(dclk_elem).perform()
alert=driver.switch_to.alert
print(alert.text)
alert.accept()


driver.quit()
```

4) Drag and drop
   a. Get elem of source and dest

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriverimportActionChains

driver=webdriver.Chrome()
driver.get("http://www.dhtmlgoodies.com/scripts/drag-drop-custom/demo-drag-drop-3.html")
driver.maximize_window()

source_elem=driver.find_element(By.ID,'box6')
dest_elem=driver.find_element(By.ID,'box106')

action=ActionChains(driver)

#draganddrop
action.drag_and_drop(source_elem,dest_elem).perform()
```

   b. Offset

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriverimportActionChains

driver=webdriver.Chrome()
driver.get("https://www.jqueryscript.net/demo/Price-Range-Slider-jQuery-UI/")
```

```
driver.maximize_window()

min_slider_elem=driver.find_element(By.XPATH,'//*[@id="slider-range"]/span[1]')
max_slider_elem=driver.find_element(By.XPATH,'//*[@id="slider-range"]/span[2]')

print(min_slider_elem.location)#{'x':59,'y':250}
print(max_slider_elem.location)#{'x':545,'y':250}--wecanmoveonlyxaxisnotyaxisitisfixed

action=ActionChains(driver)
# x axis for horizontal slider
# y axis will get changed for vertical slider
action.drag_and_drop_by_offset(min_slider_elem,100,0).perform()
action.drag_and_drop_by_offset(max_slider_elem,-145,0).perform()

#dependsonresolutionofwebpage
#dependsonbrowser

print(min_slider_elem.location)#{'x':161,'y':250}
print(max_slider_elem.location)#{'x':399,'y':250}
```

- Scrolling page

From browser when the page is long- it cannot be done by mouse action class

- Scroll to some offset
- Scropt until the element found
- Scroll top to bottom

```
importtime

fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriverimportActionChains

driver=webdriver.Chrome()
driver.get("https://www.countries-ofthe-world.com/flags-of-the-world.html")
driver.maximize_window()

#scrolltooffset

driver.execute_script("window.scrollBy(0,3000)","")
print(driver.execute_script("returnwindow.pageYOffset;"))

#scrolluntilelementfound
flag=driver.find_element(By.XPATH,'//img[@alt="FlagofIndia"]')
driver.execute_script("arguments[0].scrollIntoView();",flag)
print(driver.execute_script("return-window.pageYOffset;"))



#scrolltoendofpage
driver.execute_script("window.scrollBy(0,document.body.scrollHeight)","")
print(driver.execute_script("return-window.pageYOffset;"))

time.sleep(5)
#scrollbacktotopofpage
driver.execute_script("window.scrollBy(0,-document.body.scrollHeight)","")
print(driver.execute_script("return-window.pageYOffset;"))
```

FileDownload:

```
#filedownload

fromseleniumimportwebdriver
fromselenium.webdriver.common.byimportBy
importos
location=os.getcwd()


defchrome_setup():
```

```
fromselenium.webdriver.chrome.serviceimportService
#tosavethedownloadsinpreferedlocation
preferences={"download.default_directory":location}
ops=webdriver.ChromeOptions()
ops.add_experimental_option("prefs",preferences)

servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj,options=ops)
returndriver


defedge_setup():
fromselenium.webdriver.edge.serviceimportService
#tosavethedownloadsinpreferedlocation
preferences={"download.default_directory":location}
ops=webdriver.EdgeOptions()
ops.add_experimental_option("prefs",preferences)
servcie_obj=Service("E:\selenium\drivers\msedgedriver.exe")
driver=webdriver.Edge(service=servcie_obj,options=ops)
returndriver


deffirefox_setup():
fromselenium.webdriver.firefox.serviceimportService
#toskipanddownloadthefilewindowinfirefox
#setting
ops=webdriver.FirefoxOptions()
ops.set_preference("browser.helperApps.neverAsk.saveToDisk","application/txt")#/msword,/txt,/pdf
#https://developer.mozilla.org/en-US/docs/Web/HTTP/Basics_of_HTTP/MIME_types/Common_types
ops.set_preference("bowser.download.manager.showWhenStarting",False)
ops.set_preference("browser.download.folderList",2)#0-desktop,1-downloadfolder,2-desiredloc
ops.set_preference("browser.download.dir",location)#onlythefolderlistis2
#servcie_obj=Service("E:\selenium\drivers\geckodriver.exe")
driver=webdriver.Firefox(options=ops)
returndriver


#driver=chrome_setup()
#driver=edge_setup()
driver=firefox_setup()
driver.maximize_window()
driver.get('https://file-examples.com/index.php/sample-documents-download/sample-doc-download/')
driver.find_element(By.XPATH,'//*[@id="table-files"]//tr[1]/td[5]/a').click()
```

For PDF files which uses browser download- this option is not working in edge browser**(known issue with bowser)**

```
#filedownload


fromseleniumimportwebdriver
fromselenium.webdriver.common.byimportBy
importos
location=os.getcwd()


defchrome_setup():
fromselenium.webdriver.chrome.serviceimportService
#tosavethedownloadsinpreferedlocation
preferences={"download.default_directory":location,"plugins.always_open_pdf_externally":True}
ops=webdriver.ChromeOptions()
ops.add_experimental_option("prefs",preferences)

servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj,options=ops)
returndriver


defedge_setup():
fromselenium.webdriver.edge.serviceimportService
#tosavethedownloadsinpreferedlocation
preferences={"download.default_directory":location,"plugins.always_open_pdf_externally":True}
ops=webdriver.EdgeOptions()
ops.add_experimental_option("prefs",preferences)
servcie_obj=Service("E:\selenium\drivers\msedgedriver.exe")
driver=webdriver.Edge(service=servcie_obj,options=ops)
returndriver
```

```
deffirefox_setup():
fromselenium.webdriver.firefox.serviceimportService
#toskipanddownloadthefilewindowinfirefox
#setting
ops=webdriver.FirefoxOptions()
ops.set_preference("browser.helperApps.neverAsk.saveToDisk","application/pdf")#/msword,/txt,/pdf
#https://developer.mozilla.org/en-US/docs/Web/HTTP/Basics_of_HTTP/MIME_types/Common_types
ops.set_preference("bowser.download.manager.showWhenStarting",False)
ops.set_preference("browser.download.folderList",2)#0-desktop,1-downloadfolder,2-desiredloc
ops.set_preference("browser.download.dir",location)#onlythefolderlistis2
ops.set_preference("pdfjs.disabled",True)
#servcie_obj=Service("E:\selenium\drivers\geckodriver.exe")
driver=webdriver.Firefox(options=ops)
returndriver


#driver=chrome_setup()
#driver=edge_setup()#
driver=firefox_setup()
driver.maximize_window()
driver.get('https://file-examples.com/index.php/sample-documents-download/sample-pdf-download/')
driver.find_element(By.XPATH,'//*[@id="table-files"]//tr[1]/td[5]/a').click()


#####################################################################333

importpyautogui
importtime
fromseleniumimportwebdriver
fromselenium.webdriver.common.byimportBy
importos
print(os.getcwd())
location=os.getcwd()

defedge_setup():
fromselenium.webdriver.edge.serviceimportService
servcie_obj=Service("E:\selenium\drivers\msedgedriver.exe")

preferences={"download.default_directory":location,
"plugins.always_open_pdf_externally":True,
"download.prompt_for_download":False}
#preferences={"download.default_directory":r"C:\Users\user\PycharmProjects\pythonselenium\venv\selenium"}

ops=webdriver.EdgeOptions()
ops.UseChromium=True
ops.add_experimental_option("prefs",preferences)
driver=webdriver.Edge(service=servcie_obj,options=ops)
returndriver

driver=edge_setup()
driver.get("edge://settings/downloads")

driver.find_element(By.XPATH,'//input[@aria-label="OpenOfficefilesinthebrowser"]').click()
time.sleep(2)

driver.get("https://file-examples.com/index.php/sample-documents-download/sample-doc-download/")
driver.maximize_window()

driver.find_element(By.XPATH,'//*[@id="table-files"]/tbody/tr[1]/td[5]/a').click()
time.sleep(10)

##pdfdownload
#driver.get("https://file-examples.com/index.php/sample-documents-download/sample-pdf-download/")
#driver.maximize_window()
#driver.find_element(By.XPATH,'//*[@id="table-files"]/tbody/tr[1]/td[5]/a').click()
#time.sleep(10)


#pyautogui.hotkey('ctrl','s')
#time.sleep(5)
#pyautogui.typewrite(location+"/"+"pyautoit_download.pdf")
#pyautogui.press('enter')
#####################################################################
```

Upload file

```
fromseleniumimportwebdriver
fromselenium.webdriver.chrome.serviceimportService
fromselenium.webdriver.common.byimportBy
fromselenium.webdriver.support.selectimportSelect
```

```
servcie_obj=Service("E:\selenium\drivers\chromedriver.exe")
driver=webdriver.Chrome(service=servcie_obj)
driver.maximize_window()
driver.get('https://www.foundit.in/')
driver.find_element(By.XPATH,'//*[@id="heroSection-container"]/div[3]/div[2]/div[2]').click()
driver.find_element(By.ID,"file-upload").send_keys(r"C:\Users\user\Downloads\info.txt")

##########################################################################33
```

- handling cookies- browsers remember data(username password, sugesstion are based on data)--using cookies

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

driver=webdriver.Chrome()
driver.get( https://money.rediff.com/gainers)
driver.maximize_window()

#cookie---> having attribute linke name, value, expiredate...which will redturn dict collection
#print(driver.get_cookie())
cookies = driver.get_cookies() # capture cookies from the browsers
print("size of cookies", len(cookies))
# print det of all cookies
#for c in cookies:
   #print(c)
   #print(c["domain"]," : ",c["name"])

# how to add new cookie
driver.add_cookie({"name": "mycookie", "value":"12345"})
cookies = driver.get_cookies() # capture cookies from the browsers
print("size of cookies after adding cookie", len(cookies))

# delete the cookie

driver.delete_cookie("mycookie")
cookies = driver.get_cookies()
print("size of cookies after deleting cookie", len(cookies))
driver.delete_all_cookies()
cookies = driver.get_cookies()
print("size of cookies after deleting all cookies", len(cookies))
driver.quit()

#########################################################################333
```

- Head less mode testing-runs in backend-execution is faster

```
import time
from selenium import webdriver

def chrome_headless():
   from selenium.webdriver.chrome.service import Service
   ops=webdriver.ChromeOptions()
   ops.add_argument("--headless")
   driver=webdriver.Chrome(options=ops)
   return driver

def edge_headless():
   from selenium.webdriver.edge.service import Service
   ops=webdriver.EdgeOptions()
   ops.add_argument("--headless")
   driver=webdriver.Edge(options=ops)
   return driver

def firefox_headless():
   from selenium.webdriver.firefox.service import Service
   ops=webdriver.FirefoxOptions()
   ops.add_argument("--headless")
   driver=webdriver.Firefox(options=ops)
   return driver

#driver=chrome_headless()
#driver=edge_headless()
driver=firefox_headless()
driver.get( https://money.rediff.com/gainers)
print(driver.current_url)
print(driver.title)
driver.quit()
```

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- Autocomplete

```
import time
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.common.by import By
from selenium.webdriver.common.keys import Keys

driver=webdriver.Chrome()
driver.get( https://www.google.com/)
driver.maximize_window()

search_elem = driver.find_element(By.XPATH, "//*[@name='q']")
search_elem.click()
# time.sleep(4)
# search_elem.send_keys(Keys.ARROW_DOWN)
# time.sleep(4)
# search_elem.send_keys(Keys.ARROW_DOWN)
# time.sleep(4)
#print(search_elem.get_attribute("value"))

# suggestion_len = len(driver.find_elements(By.XPATH, '//*[@id="Alh6id"]/div[1]/div/ul/li'))
# for sug in range(suggestion_len):
#     time.sleep(4)
#     search_elem.send_keys(Keys.ARROW_DOWN)
#     print(search_elem.get_attribute("value"))

elem = driver.find_elements(By.XPATH, '//*[@id="Alh6id"]/div[1]/div/ul/li/div/div[2]/div[1]/div[1]/span')
for i in elem:
    print(i.text)
```

Tips to freeze or get autosuggestions:

Control+\ or F8 pause the java exe

Go to event listeners-> look for 'blur' option -> click remove remove all property(works for auto selection)

Go to event listeners-> look for 'mouseout' option -> click remove remove all property(works for tooltip)

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- DatePicker-

  Ref : datetime — Basic date and time types — Python 3.11.4 documentation

```
import datetime
#year month date time min sec millisec
date_time = datetime.datetime(2005, 4, 16)
print(date_time.strftime("%B %d, %Y %H:%M %p"))
current_time = datetime.datetime.now()
print(current_time.strftime("%B %d, %Y %H:%M %p"))
```

Shadow DOM