Selenium Python之学习笔记

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➢ 示例

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.by importBy
from selenium.webdriver.support.ui import WebDriverWait  #available
since 2.4.0
from selenium.webdriver.support import expected_conditions as EC
#avaliable since 2.26.0#注意“as 别名”的写法

#import time
if __name__ == "__main__":
    #Create a new instance of the Firfox driver
    driver = webdriver.Firefox()

    #max window
    driver.maximize_window()

    #go to the baidu skydriver home page
    driver.get('http://www.baidu.com')

    #print page title
print driver.title

    #find the element that's id attribute is kw1(the baidu search box)
input_element  = driver.find_element_by_id('kw1')

    #type in the search box
input_element.send_keys(授客!')

    #submit the form
input_element.submit()

try:
       #we have to wait for the page to refresh, the last thing that seems
to be updated is the title
       WebDriverWait(driver, 10).until(EC.title_contains('cheese!'))
print(driver.title)
finally:
       driver.quit()
```

说明：

```
# coding= utf-8
```

源程序为utf-8编码

```
from selenium import webdriver
```
要想使用selenium包中的webdriver模块里的函数，首先把包导进来

```
input_element.submit()
```
提交表单，此处也可以换成鼠标点击的方式，如下：
```
driver.find_element_by_id("su1").click()
```
查找属性id为su1的控件，即搜索按钮“百度一下”，然后点击click

- 获取一个页面

示例：打开博客网址http://ishouke.blog.sohu.com/
```
driver.get('http://ishouke.blog.sohu.com/')
```

- 关闭页面

```
driver.close()
```
注意：仅关闭当前窗口，不会关闭驱动

- 退出

退出并关闭窗口的每一个相关的驱动程序
```
driver.quit()
```

- 定位元素

● By ID(标签属性)

示例：
```
<div id="shouke">...</div>
element = driver.find_element_by_id('shouke')
```
或者
```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.ID, 'shouke')
```

● By Class Name(标签属性)

实际应用中，经常会有相同的class name，所以class name查找多个元素会比较实用

示例：
```
<div class="shouke">
<span>Cheddar</span>
</div>
<div class="shouke">
<span>授客</span>
</div>
```
```
elements= driver.find_elements_by_class_name('shouke')
```
或
```
from selenium.webdriver.common.by importBy
elements= driver.find_elements(By.CLASS_NAME,'shouke')
```

- By Tag Name(标签名)

示例：

```
<iframe src="..."></iframe>
frame = driver.find_element_by_tag_name('iframe')
```

或者

```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.TAG_NAME,'iframe')
```

- By Name(标签属性)

示例：

```
<input name="shouke" type="text"></input>
shouke = driver.find_element_by_name('shouke')
```

或者

```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.NAME,'shouke')
```

- By Link Text(元素内容)

一般情况，某个页面上不会出现相同的文字链接，通过文字链接来定位也是一种简单有效的定位方式

示例：

```
<a href="http://www.baidu.com/baidu?tn=monline_5_dg&ie=utf-8&wd=shouke">
search for shouke
</a>
```

```
driver.find_element_by_link_text('search for shouke')
```

或者

```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.LINK_TEXT,'search for shouke')
```

示例：模拟点击贴吧

```
# coding= utf-8 #可加可不加，防止中文乱码
from selenium import webdriver
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.implicitly_wait(10)
    driver.get("http://www.baidu.com/")
    driver.find_element_by_link_text('贴吧').click()
    driver.quit()
```

- By Partial Link Text(元素内容)

通过部分链接定位，即仅用链接的一部分文字进行匹配

示例：

```
<a href="http://www.baidu.com/baidu?tn=monline_5_dg&ie=utf-8&wd=shouke">
search for shouke
</a>
```

```
driver.find_element_by_partial_link_text('shouke')
```
或者
```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.LINK_TEXT,'shouke')
```
示例：模拟点击贴吧
```
# coding= utf-8 #可加可不加，防止中文乱码
from selenium import webdriver
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.implicitly_wait(5)
    driver.get('http://www.baidu.com/')
    driver.find_element_by_partial_link_text('贴').click()
    driver.quit()
```

- By CSS_Selector

示例：
```
<div id="shouke"><span class="dairy">test</span></div>
shouke = driver.find_element_by_css_selector('#shouke'))
```
或者
```
from selenium.webdriver.common.by importBy
element = driver.find_element(By.CSS_SELECTOR,'#shouke')
```
注意：

1. 不是所有浏览器都支持
2. css selector定位比xpath定位更速度，更快

- By XPATH

对于不支持本地Xpaht的浏览器，selenium也提供了自己的实现。但是Xpath引擎有所不同，如下表。

Driver	Tag and Attribute Name	Attribute Values	Native XPath Support
HtmlUnit Driver	Lower-cased	As they appear in the HTML	Yes
Internet Explorer Driver	Lower-cased	As they appear in the HTML	No
Firefox Driver	Case insensitive	As they appear in the HTML	Yes

示例：
```
<input type="text" name="授客" />
<INPUT type='text' name="shouke" />
inputs = driver.find_elements_by_xpath('//input')
```
或者
```
from selenium.webdriver.common.by importBy
inputs = driver.find_elements(By.XPATH,'//input')
```

不同浏览器驱动下，匹配的iput元素个数如下：

XPath expression	**HtmlUnit Driver**	**Firefox Driver**	**Internet Explorer Driver**
//input	1 ("example")	2	2
//INPUT	0	2	0

------------------------------定位单个元素----------------------------------

示例1：对百度搜索输入框的进行定位

搜索框的部分html代码，如下

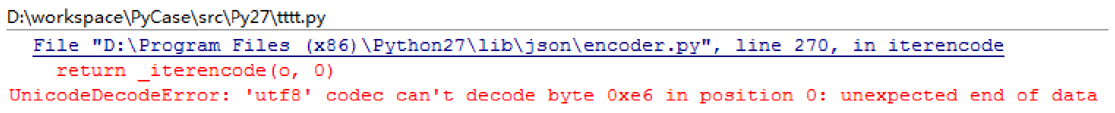
```
<input name="wd" class="" id="kw1" style="width: 521px;" type="text" maxLength="100"
```

```
#coding= utf-8 #可加可不加，防止中文乱码
from selenium import webdriver
import time

if __name__ == '__main__':
    driver = webdriver.Ie()

    driver.get('http://www.baidu.com/')
    driver.implicitly_wait(5)

    #通过标签属性id定位
    search_ipt = driver.find_element_by_id('kw1')

    search_ipt.send_keys(u'授客') #输入搜索内容
    time.sleep(1)
    search_ipt.clear()   #清空百度搜索输入输入框
    time.sleep(1)

    #通过标签属性name定位
    search_ipt = driver.find_element_by_name('wd')

    search_ipt.send_keys(u'授客')
    time.sleep(1)
    search_ipt.clear()
    time.sleep(1)

    #通过标签名tag name定位
    search_ipt = driver.find_element_by_tag_name('input')
    search_ipt.send_keys(u'授客')
    time.sleep(1)
    search_ipt.clear()
    time.sleep(1)

    #通过css selector定位
    search_ipt = driver.find_element_by_css_selector('#kw1')
    search_ipt.send_keys(u'授客')
    time.sleep(1)
    search_ipt.clear()
    time.sleep(1)

    #通过xpaht定位
    search_ipt = driver.find_element_by_xpath('//input[@id="kw1"]')
    search_ipt.send_keys(u'授客')

    #通过标签属性className方式定位(this.className)
    serach_btn = driver.find_element_by_id('su1').click()
    time.sleep(3)
    driver.quit()
```

注意：

search_ipt.send_keys(u'授客') #此处如果不加u，会出现以下错误

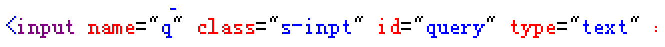
```
UnicodeDecodeError: 'utf8' codec can't decode byte 0xe6 in position 0:
unexpected end of data
```



```
D:\workspace\PyCase\src\Py27\tttt.py
  File "D:\Program Files (x86)\Python27\lib\json\encoder.py", line 270, in iterencode
    return _iterencode(o, 0)
UnicodeDecodeError: 'utf8' codec can't decode byte 0xe6 in position 0: unexpected end of data
```

示例2：对有道搜索输入框的进行定位

搜索输入框部分html代码如下



```
<input name="q" class="s-inpt" id="query" type="text" :
```

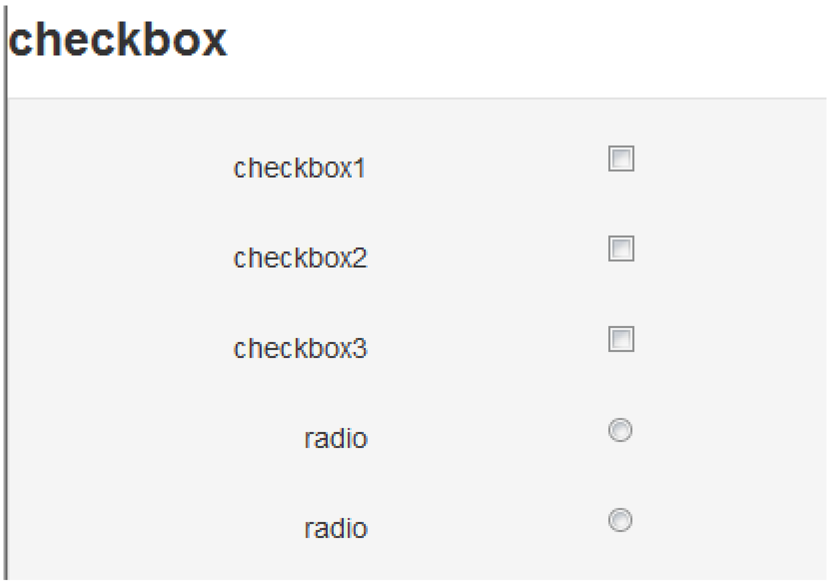
```
# coding= utf-8
from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Ie()

    driver.get("http://www.youdao.com/")
    driver.implicitly_wait(10)

    #通过标签属性class定位
    search_ipt = driver.find_element_by_class_name('s-inpt')
    search_ipt.send_keys(u'授客')

    driver.find_element_by_class_name('s-btn').click()

    time.sleep(3)
    driver.quit()
```

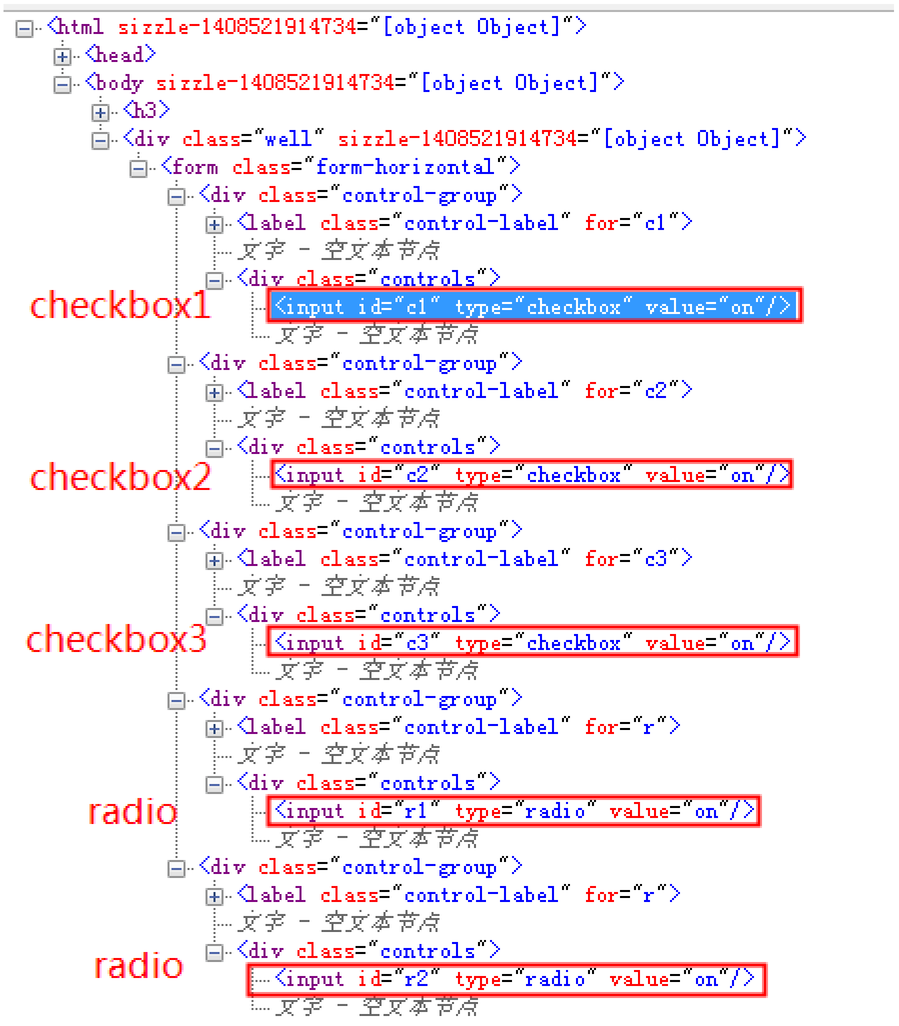
------------------------------定位一组元素----------------------------------
find_element_by_xx方法可以定位单个元素，定位一组元素则要用find_elements_by_xxx方法（注意，该方法返回list列表对象）

定位一组对象一般用于以下场景：

- 批量操作对象，比如将页面上所有的checkbox都勾上
- 先获取一组对象，再在这组对象中过滤出需要具体定位的一些对象。比如，定位出页面上所有的checkbox，然后选择最后一个

注意：
1.把“checkbox.html”放在同脚本放在同一工作目录下
2.ie下运行或报错，提示找不到元素，
解决方法：去掉“IE已限制此网页运行可以访问计算机的脚本或ActiveX控件”提醒





```
<html sizzle-1408521914734="[object Object]">
  <head>
  <body sizzle-1408521914734="[object Object]">
    <h3>
    <div class="well" sizzle-1408521914734="[object Object]">
      <form class="form-horizontal">
        <div class="control-group">
          <label class="control-label" for="c1">
          文字 - 空文本节点
          <div class="controls">
            <input id="c1" type="checkbox" value="on"/>
            文字 - 空文本节点
        <div class="control-group">
          <label class="control-label" for="c2">
          文字 - 空文本节点
          <div class="controls">
            <input id="c2" type="checkbox" value="on"/>
            文字 - 空文本节点
        <div class="control-group">
          <label class="control-label" for="c3">
          文字 - 空文本节点
          <div class="controls">
            <input id="c3" type="checkbox" value="on"/>
            文字 - 空文本节点
        <div class="control-group">
          <label class="control-label" for="r">
          文字 - 空文本节点
          <div class="controls">
            <input id="r1" type="radio" value="on"/>
            文字 - 空文本节点
        <div class="control-group">
          <label class="control-label" for="r">
          文字 - 空文本节点
          <div class="controls">
            <input id="r2" type="radio" value="on"/>
            文字 - 空文本节点
```

示例1：批量勾选页面上所有复选框

方法一

```
# coding= utf-8

from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath("checkbox.html")
    driver.get(file_path)
    driver.implicitly_wait(5)  #

    # 选择所有的input元素
    inputs = driver.find_elements_by_tag_name("input")
    #或者如下
    #inputs = driver.find_elements_by_css_selector("input")

    #或者如下
    #inputs = driver.find_elements_by_xpath("//input")

    #过滤出所有的checkbox并勾选之（属性type值为checkbox则为checkbox元素）
    forinputin inputs:
#获取元素的某个属性值element.get_attribute('attribute_name')
        if input.get_attribute('type') == 'checkbox':
input.click()

    time.sleep(5)
    driver.quit()
```

方法二

```
# coding= utf-8

from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath("checkbox.html")
    driver.get(file_path)
    driver.implicitly_wait(10)  #

    #选择所有的checkbox元素
    checkboxes=driver.find_elements_by_css_selector('input[type="checkbox"]
')

    #或者如下
    checkboxes = driver.find_elements_by_xpath('//input[@type="checkbox"]')

for checkbox in checkboxes:
        checkbox.click()

    time.sleep(10)

    # 打印当前页面有多少个checkbox
    print(len(checkboxes))
    driver.quit()
```

示例2：去掉最后一个复选框

```
# -*- coding: utf-8 -*-

from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath("checkbox.html")
    driver.get(file_path)
    driver.implicitly_wait(10)  #

    # 选择所有的input，然后从中过滤出所有的checkbox并勾选之
    checkboxes =
driver.find_elements_by_css_selector('input[type=checkbox]')

for checkbox in checkboxes:
        checkbox.click()

    time.sleep(5)

    # 去掉最后一个复选框
    checkboxes.pop(len(checkboxes) - 1).click()

    time.sleep(5)

    driver.quit()
```

- 获取元素属性

element.get_attribute(attribute_name)

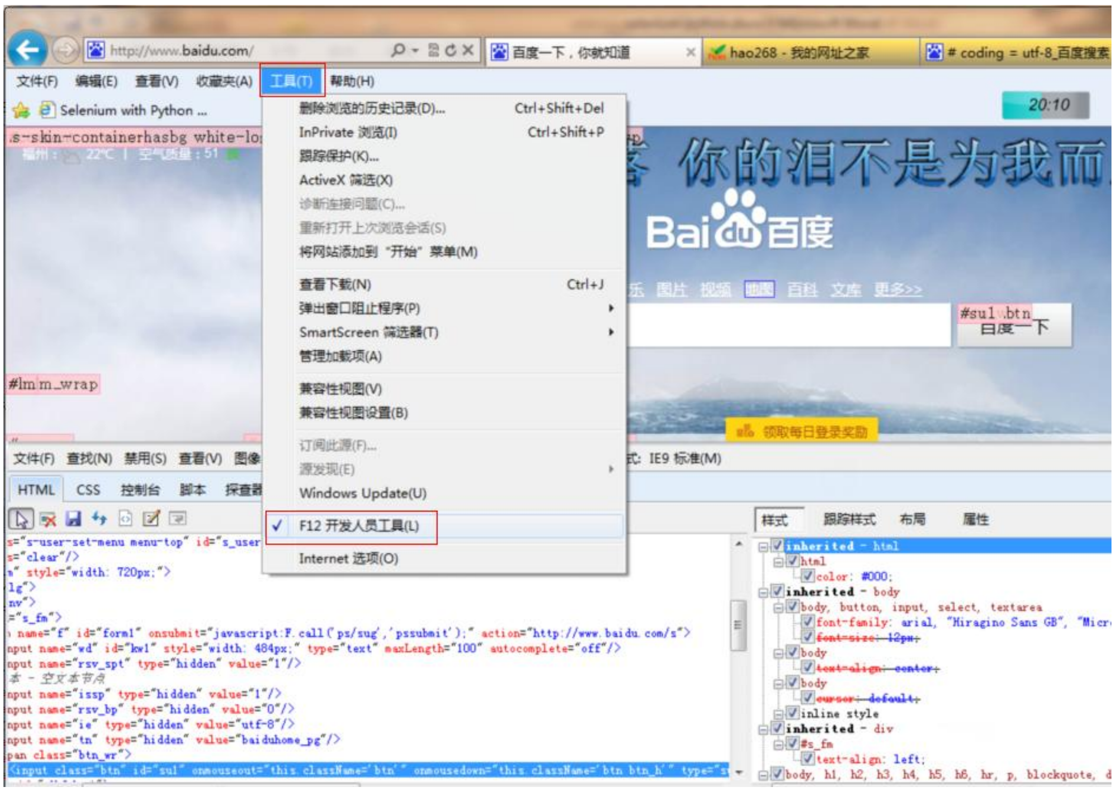
示例：

```
# coding= utf-8
from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.implicitly_wait(10)
    driver.get('http://ishouke.blog.sohu.com/')
    blog_url = driver.find_element_by_id('blogUrl')

    home_page = blog_url.find_element_by_link_text('首页') #定位"首页"连
接元素

    #打印连接href属性
print(home_page.get_attribute('href'))

    time.sleep(5)
    driver.quit()
```

附：查看页面元素id，name等属性的方法

- ie浏览器

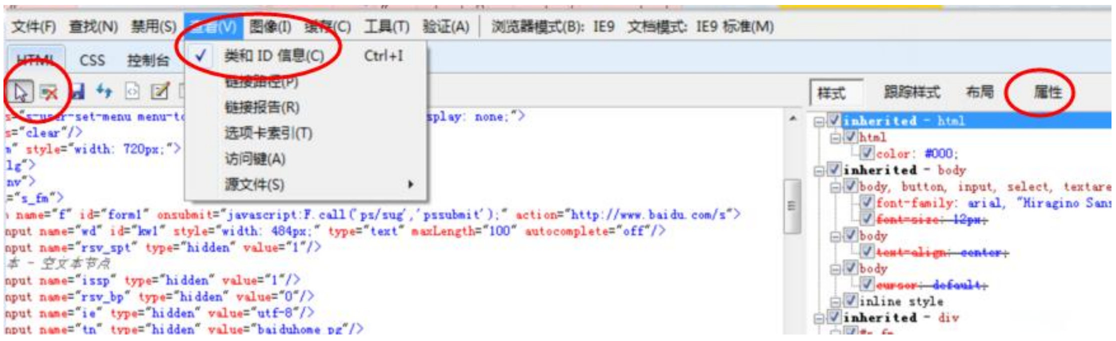
1.如下，打开浏览器，打开要测试的网址，点击工具->F12开发人员工具，打开图示的调试器



```
s="s-user-set-menu menu-top" id="s_user
s="clear"/>
n" style="width: 720px;">
lg">
nv">
="s_fm">
 name="f" id="form1" onsubmit="javascript:F.call('ps/sug','pssubmit');" action="http://www.baidu.com/s">
nput name="wd" id="kw1" style="width: 484px;" type="text" maxLength="100" autocomplete="off"/>
nput name="rsv_spt" type="hidden" value="1"/>
本 - 空文本节点
nput name="issp" type="hidden" value="1"/>
nput name="rsv_bp" type="hidden" value="0"/>
nput name="ie" type="hidden" value="utf-8"/>
nput name="tn" type="hidden" value="baiduhome_pg"/>
pan class="btn_wr">
<input class="btn" id="sul" onmouseout="this.className='btn'" onmousedown="this.className='btn btn_h'" type="s
```

```
inherited - html
  html
    color: #000;
inherited - body
  body, button, input, select, textarea
    font-family: arial, "Hiragino Sans GB", "Micr
    ~~font-size: 12px;~~
  body
    ~~text-align: center;~~
  body
    ~~cursor: default;~~
  inline style
inherited - div
  #s_fm
    text-align: left;
body, h1, h2, h3, h4, h5, h6, hr, p, blockquote, d
```

2.可以通过查看类和ID信息，或者单击元素->属性，查看控件的信息



```
s="s-user-set-menu menu-t                    splay: none;">
s="clear"/>
n" style="width: 720px;">
lg">
nv">
="s_fm">
 name="f" id="form1" onsubmit="javascript:F.call('ps/sug','pssubmit');" action="http://www.baidu.com/s">
nput name="wd" id="kw1" style="width: 484px;" type="text" maxLength="100" autocomplete="off"/>
nput name="rsv_spt" type="hidden" value="1"/>
本 - 空文本节点
nput name="issp" type="hidden" value="1"/>
nput name="rsv_bp" type="hidden" value="0"/>
nput name="ie" type="hidden" value="utf-8"/>
nput name="tn" type="hidden" value="baiduhome_pg"/>
```

```
inherited - html
  html
    color: #000;
inherited - body
  body, button, input, select, textare
    font-family: arial, "Hiragino Sans
    ~~font-size: 12px;~~
  body
    ~~text-align: center;~~
  body
    ~~cursor: default;~~
  inline style
inherited - div
```

- 火狐

安装debug插件，右键查看元素

➢ 操作元素

需要引入ActionChains类(点击除外)

```
from selenium.webdriver.common.action_chains import ActionChains
```

● 鼠标操作

1. 鼠标点击元素

```
element.click()
```

2. 鼠标右键

```
chain = ActionChains(driver)
chain.context_click(element).perform()
```

示例：

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.action_chains import ActionChains
import time
if __name__ == "__main__":
    driver = webdriver.Ie()

    # 访问百度登录页面
    driver.get("http://www.baidu.com/")
    driver.implicitly_wait(5)  # 智能等待5秒

    #鼠标右键搜索按钮
    chain = ActionChains(driver)
    rt = driver.find_element_by_id("su1")
    chain.context_click(rt).perform()
    time.sleep(5)

    driver.quit()
```

3. 鼠标双击

```
chain = ActionChains(driver)
chain.double_click(element).perform()
```

示例：

```
#coding= utf-8 #可加可不加，防止中文乱码
from selenium import webdriver
from selenium.webdriver.common.action_chains import ActionChains
import time
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.get("http://www.baidu.com/")
    driver.implicitly_wait(5)  # 智能等待5秒

    #鼠标双击搜索按钮
    chain = ActionChains(driver)
    rt = driver.find_element_by_id("su1")
    chain.double_click(rt).perform()

    time.sleep(5)
    driver.quit()
```

4. 鼠标拖拽

```
action = ActionChains(driver)
action.drag_and_drop(source_element, target_element).perform()
```

示例：

```
# -*- coding: utf-8 -*-
from selenium import webdriver
from selenium.webdriver.common.action_chains import ActionChains
import time

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    driver.get('http://www.ztree.me/v3/demo/cn/exedit/drag.html')

    #find source element with title attribute '随意拖拽 1-1'
    source = driver.find_element_by_id('treeDemo_2_a')

    #find target element with title arrtibute '随意拖拽1-2'
    target = driver.find_element_by_id('treeDemo_3_a')

    #construct class ActionChains object
    action = ActionChains(driver)

    #move source element to the position of target element
    action.drag_and_drop(source, target).perform()

    time.sleep(3)
    #change target element, try again
    target = driver.find_element_by_id('treeDemo_1_ul')
    action.drag_and_drop(source, target).perform()

    time.sleep(3)
    driver.quit()
```

● 键盘操作

键盘操作需要引入Keys类(输入文字除外)

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

✧ 输入文字

element.send_keys(text)

✧ 单按键操作

1. TAB键操作

element.send_keys(Keys.TAB)

示例

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.keys import Keys
import time
if __name__ == "__main__":
    driver = webdriver.Ie()
    # 访问115登录页面
    driver.get('http://www.115.com/')
    driver.implicitly_wait(5)  # 智能等待5秒
    driver.maximize_window()

    account_ipt = driver.find_element_by_id('js-account')
    account_ipt.clear()
    account_ipt.send_keys('24636313') # 输入帐号

    time.sleep(2)
    #定位密码输入框
    passwd_ipt = driver.find_element_by_id('js-passwd')
    #模拟tab键,把光标定位到密码框,模拟光标一闪一闪的状态
    times = 10
while(times >= 0):
        passwd_ipt.send_keys(Keys.TAB)
        time.sleep(1)
        times = times - 1

    time.sleep(3)
    driver.quit()
```

5. 回车键(Enter)操作

element.send_keys(Keys.ENTER)

示例：模拟回车登录115网盘

```
# coding= utf-8
```

```
fromseleniumimport webdriver
fromselenium.webdriver.common.keys import Keys#需要引入Keys包
import time
if __name__ == "__main__":
    driver = webdriver.Ie()
    # 访问115登录页面
    driver.get("http://www.115.com/")
    driver.implicitly_wait(5)  #智能等待5秒
    driver.maximize_window()

    account_ipt = driver.find_element_by_id('js-account')
    account_ipt.clear()
    account_ipt.send_keys('laiyuhenshuai@163.com') # 输入帐号

    time.sleep(1)
    #定位密码输入框
    passwd_ipt = driver.find_element_by_id('js-passwd')
    passwd_ipt.send_keys('huozhe') #输入密码

    #模拟回车方式登录(注意：元素要选择对)
    passwd_ipt.send_keys(Keys.ENTER)

    time.sleep(3)
    driver.quit()
```

说明：也可以通过定位登录按钮，点击click，代替定位密码框回车

6. 退格键(Backspace)操作

element.send_keys(Keys.BACKSPACE)

示例：百度搜索框中输入内容，然后退格键删除一个字符

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.keys import Keys #需要引入Keys包
import time

if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.maximize_window()
    driver.get('http://www.baidu.com')
    driver.implicitly_wait(5)

    s_ipt = driver.find_element_by_id('kw1')
    #输入框输入内容
    s_ipt.send_keys(u'hello,授客')
    time.sleep(1)

    #退格删除1个字符
    s_ipt.send_keys(Keys.BACKSPACE)

    time.sleep(3)
    driver.quit()
```

✧ 按键组合操作

1. 全选操作(Control+a)

element.send_keys(Keys.CONTROL, a)

2. 复制操作(Control+c)

element.send_keys(Keys.CONTROL, c)

3. 剪切操作(Control+x)

element.send_keys(Keys.CONTROL, x)

4. 黏贴操作

element.send_keys(Keys.CONTROL, v)

示例：

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.keys import Keys #需要引入Keys包
import time

if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.maximize_window()
    driver.get('http://www.baidu.com')
    driver.implicitly_wait(5)

    s_ipt = driver.find_element_by_id('kw1')
    #输入框输入内容
    s_ipt.send_keys(u'授客')
    time.sleep(1)

    #全选输入框内容
    s_ipt.send_keys(Keys.CONTROL, 'a')
    time.sleep(1)

    #复制输入框内容
    s_ipt.send_keys(Keys.CONTROL, 'c')
    time.sleep(1)

    # 剪切输入的内容
    s_ipt.send_keys(Keys.CONTROL, 'x')
    time.sleep(1)

    # 黏贴复制的内容
    s_ipt.send_keys(Keys.CONTROL, 'v')

    driver.find_element_by_id("su1").send_keys(Keys.ENTER)

    time.sleep(3)
    driver.quit()
```

● 清空对象内容

element.clear()

示例：清空百度搜索输入框

```
# coding= utf-8
from selenium import webdriver
import time
if __name__ == "__main__":
    driver = webdriver.Ie()

    # 访问百度首页
    driver.get('http://www.baidu.com')
    driver.implicitly_wait(5)  # 智能等待5秒
    s_ipt = driver.find_element_by_id('kw1')# kw1为输入框id
    s_ipt.send_keys(u'授客') #输入搜索内容
    time.sleep(2)
    s_ipt.clear()#清空搜索内容
    time.sleep(3)

    driver.quit()
```

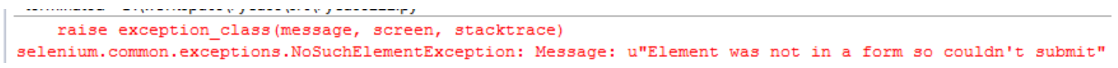
● 提交表单

示例：

```
<button type="button" id="submit">submit form</button>
```

element.submit()

注意：submit()方法的使用前提是元素element必须在表单范围内，即元素element必须是form元素的子元素，否则会抛出异常NoSuchElementException，如下：



```
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.NoSuchElementException: Message: u"Element was not in a form so couldn't submit"
```

注：提交表单也可以用点击来实现

```
driver.find_element_by_id('submit').click()
```

表单样式如下

```
<form>
<button type="button" id="submit">submit form</button>
...
<element>...</element>
</form>
```

示例：提交表单

```
# coding= utf-8
from selenium import webdriver
import time
if __name__ == "__main__":
    driver = webdriver.Ie()

    # 访问百度首页
    driver.get("http://www.baidu.com")
    driver.implicitly_wait(5)  # 智能等待5秒
    driver.find_element_by_id('kw1').send_keys(u'授客') # kw1为输入框id
    time.sleep(2)

    # 通过submit()来操作
    driver.find_element_by_id('su1').submit() # su1为“百度一下” 按钮id

    time.sleep(3)
    driver.quit()
```

- 处理select元素

如果采用Select类来处理，需要引入类

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

1. 取消所有选项的选中状态

```
#构造Select类对象 "select"
select = Select(select_element)
#取消所有选项的选中状态
select.deselect_all()
```

2. 根据选项元素的text内容定位选项

```
select = Select(select_element)
select.select_by_visible_text('text_value')
```

3. 根据选项元素的index定位选项

```
select = Select(select_element)
```

```
select.select_by_index(item_index)
```

注意：index从0开始算起，顺序为从上到下。

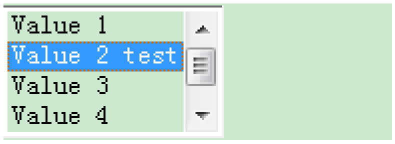
4. 根据选项元素的value属性值定位选项

```
select = Select(select_element)
select.select_by_value(value_attribute)
```

5. all_selected_options怎么用？？

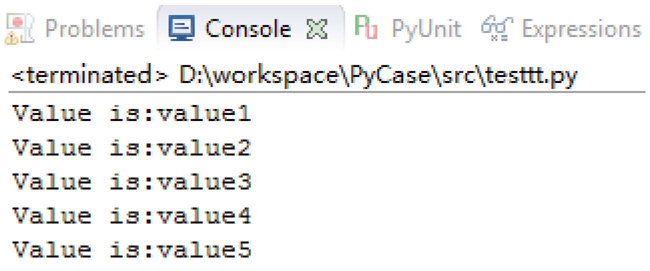
示例1：

```
<html>

<head>
<meta http-equiv="Content-type" content="text/html;charset=gb2312" />
</head>

<body>
<select name="testselect" multiple="multiple" size=4>
  <option value="value1">Value 1</option>
  <option value="value2" selected>Value 2 test</option>
  <option value="value3">Value 3</option>
  <option value="value4">Value 4</option>
  <option value="value5">Value 4</option>
</select>

</body>
</html>
```



```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('User Input-Filling In Forms.html')
    driver.get(url)
    driver.implicitly_wait(5)

    #find all elements with tag name “value”
    all_options = driver.find_elements_by_tag_name('input')
    #cycle through each options in turn,print their value and select each
for option in all_options:
print("Value is:" + option.get_attribute("value"))
        option.click()

    time.sleep(2)
    driver.quit()
```

运行后，页面上依次点选所有复选框(模拟安装ctrl键+鼠标点击操作)，而控制台输出如下



```
<terminated> D:\workspace\PyCase\src\testtt.py
Value is:value1
Value is:value2
Value is:value3
Value is:value4
Value is:value5
```

更有效率的方法

```
# -*- coding: utf-8 -*-

#available since 2.12
from selenium import webdriver
from selenium.webdriver.support.ui import Select
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('User Input-Filling In Forms.html')
    driver.get(url)
    driver.implicitly_wait(5)

    #construct Select Class Object "select"
    select = Select(driver.find_element_by_tag_name('select'))

    #clear all selected option
    select.deselect_all()

    #select the element with text value displayed "Value1"
    select.select_by_visible_text('Value 1')

    time.sleep(2)
    driver.quit()
```

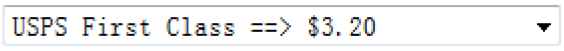
注意：

1. deselect_all()函数仅适用于<select multiple="multiple"…>这种带mutilple属性的select元素

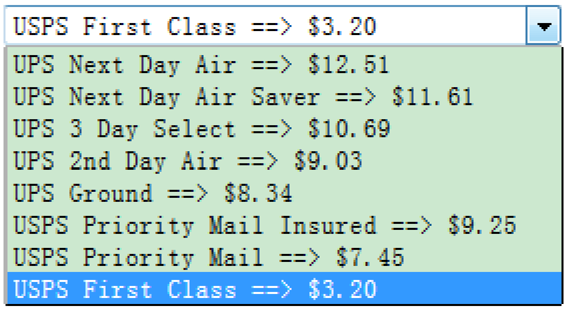
2.User Input-Filling In Forms.html文件要放在工程文件src目录下

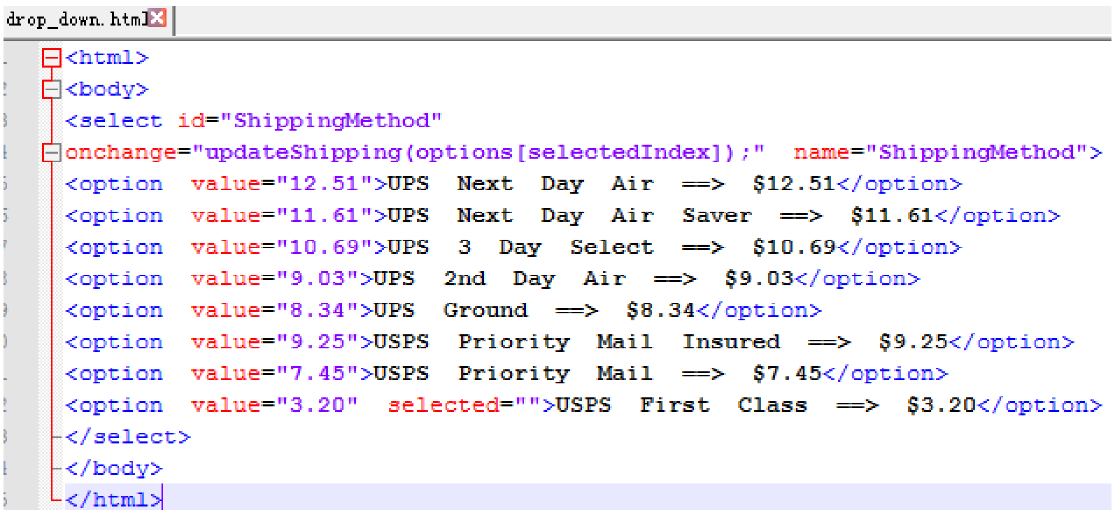
示例2

未点击时


USPS First Class ==> $3.20

点击时，弹出下拉选框


USPS First Class ==> $3.20
UPS Next Day Air ==> $12.51
UPS Next Day Air Saver ==> $11.61
UPS 3 Day Select ==> $10.69
UPS 2nd Day Air ==> $9.03
UPS Ground ==> $8.34
USPS Priority Mail Insured ==> $9.25
USPS Priority Mail ==> $7.45
USPS First Class ==> $3.20



```
<html>
<body>
<select id="ShippingMethod"
onchange="updateShipping(options[selectedIndex]);"  name="ShippingMethod">
<option  value="12.51">UPS  Next  Day  Air  ==>  $12.51</option>
<option  value="11.61">UPS  Next  Day  Air  Saver  ==>  $11.61</option>
<option  value="10.69">UPS  3  Day  Select  ==>  $10.69</option>
<option  value="9.03">UPS  2nd  Day  Air  ==>  $9.03</option>
<option  value="8.34">UPS  Ground  ==>  $8.34</option>
<option  value="9.25">USPS  Priority  Mail  Insured  ==>  $9.25</option>
<option  value="7.45">USPS  Priority  Mail  ==>  $7.45</option>
<option  value="3.20"  selected="">USPS  First  Class  ==>  $3.20</option>
</select>
</body>
</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time,os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath('drop_down.html')
    driver.get(file_path)
    driver.implicitly_wait(5)  #
    #先定位到下拉框
down_list =  driver.find_element_by_id("ShippingMethod")

    # 再点击下拉框下的选项
down_list.find_element_by_xpath("//option[@value='10.69']").click()

    time.sleep(5)
    driver.quit()
```

或者也可以如下，

```
# -*- coding: utf-8 -*-
from selenium import webdriver
from selenium.webdriver.support.ui import Select
import time,os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath('drop_down.html')
    driver.get(file_path)
    driver.implicitly_wait(5)

    down_list = Select(driver.find_element_by_tag_name('select'))

    #选择value属性的属性值为10.69的下拉选项
    down_list.select_by_value('10.69')

    #选择下拉选框中，从上往下，第二个下拉选项
    down_list.select_by_index(1)

    time.sleep(3)
    driver.quit()
```

注意：记得把drop_down.html放在工程src目录下

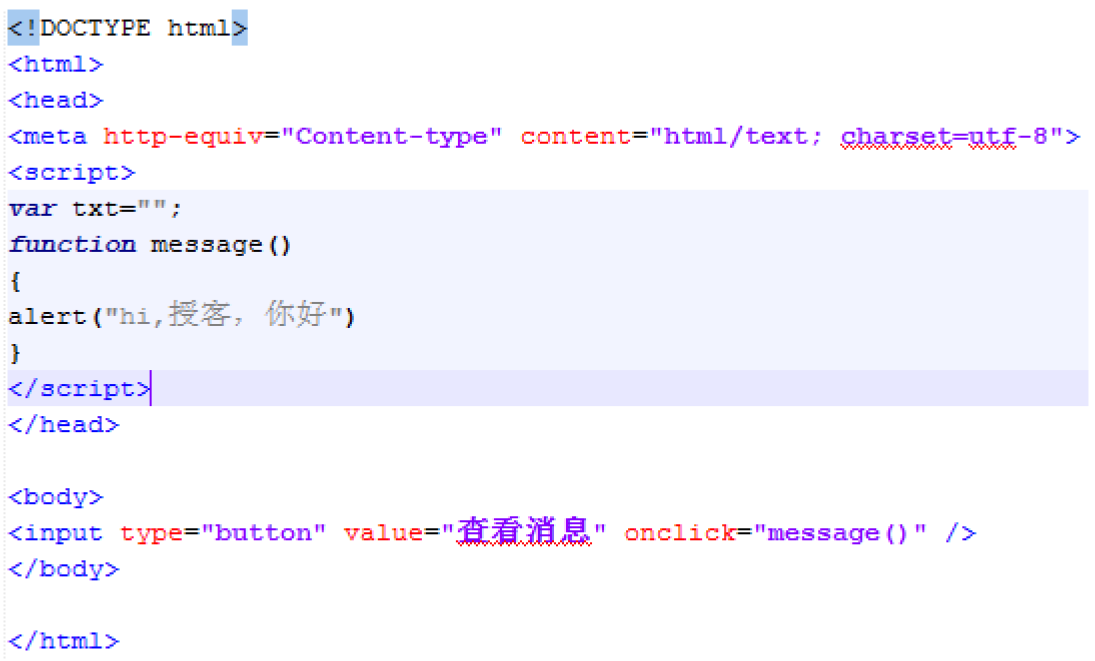
- 处理弹出对话框

包含alert(弹出告警对话框-对话框中有一个OK按钮),
confirm(确认对话框--对话框中包含一个OK按钮与Cancel按钮),
和prompt(等待输入弹出对话框--对话框中包含一个OK按钮、Cancel按钮与一个文本输入框)

1. 弹出alert对话“框确”认操作

```
alert = driver.switch_to.alert
alert.accept()
```

示例：接受告警



```
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-type" content="html/text; charset=utf-8">
<script>
var txt="";
function message()
{
alert("hi,授客, 你好")
}
</script>
</head>

<body>
<input type="button" value="查看消息" onclick="message()" />
</body>

</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('alert.html')
    driver.get(url)

    #click button with text:'查看消息'
    driver.find_element_by_tag_name('input').click()

    time.sleep(2)

    #capture the alter dialog
alter = driver.switch_to.alert

    #accept alter
alter.accept()

    time.sleep(3)
    driver.quit()
```

注意：记得把alert.html放在工程文件夹src目录下

2. 弹出confirm对话框“取消”操作

```
alert = driver.switch_to.alert
alert.dismiss()
```

示例：确认confirm对话框，忽视提醒对话框

```
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-type" content="html/text; charset=utf-8">
<script>
function message()
{
    if(confirm("确定要离开授客么？ 呜呜"))
    {
        alert("Bye,my friend.");
    }
    else
    {
        alert("嘿嘿， 你不走了呀!");
    }
}
</script>
</head>

<body>
<input type="button" value="退出" onclick="message()" />
</body>
</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('confirm.html')
    driver.get(url)

    #click button with text:'查看消息'
    driver.find_element_by_tag_name('input').click()

    time.sleep(2)
    #capture the confirm dialog
    alter = driver.switch_to.alert

    #confirm
    alter.accept()
    alter = driver.switch_to.alert
    #ignore second alter
    time.sleep(1)
    alter.dismiss()

    time.sleep(3)
    driver.quit()
```

注意：记得把confirm.html放在工程文件夹src目录下

3. 弹出prompt对话框“确认”操作

```
alert = driver.switch_to.alert
alert.accept()
```

示例：确认等待输入框

```
<!DOCTYPE html>
<html>
<head>
<script>
var txt="";
function message()
{
var sResult=prompt("请在下面输入作者名", "授客");
if(sResult!=null)
{
    alert("恭喜, 输入正确");
}
else
{
    alert("输入错误");
}
</script>
</head>

<body>
<input type="button" value="查看消息" onclick="message()" />
</body>
</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('prompt.html')
    driver.get(url)

    #click button with text:'查看消息'
    driver.find_element_by_tag_name('input').click()

    time.sleep(2)
    #capture the confirm dialog
    alter = driver.switch_to.alert

    #select ok
    alter.accept()

    time.sleep(3)
    driver.quit()
```

注意：记得把prompt.html放在工程文件夹src目录下

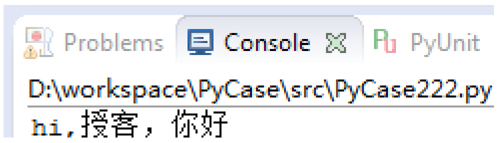
4. 获取弹出对话框文字信息

```
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-type" content="html/text; charset=utf-8">
<script>
var txt="";
function message()
{
alert("hi,授客, 你好")
}
</script>
</head>

<body>
<input type="button" value="查看消息" onclick="message()" />
</body>

</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
```

```
driver.maximize_window()
url = os.path.abspath('alert.html')
driver.get(url)

#click button with text:'查看消息'
driver.find_element_by_tag_name('input').click()

time.sleep(2)

#capture the alter dialog
alert = driver.switch_to.alert

#print text on alert object
print(alert.text)

#accept alter
alert.accept()

time.sleep(3)
driver.quit()
```

控制台输出结果：



```
D:\workspace\PyCase\src\PyCase222.py
hi,授客，你好
```

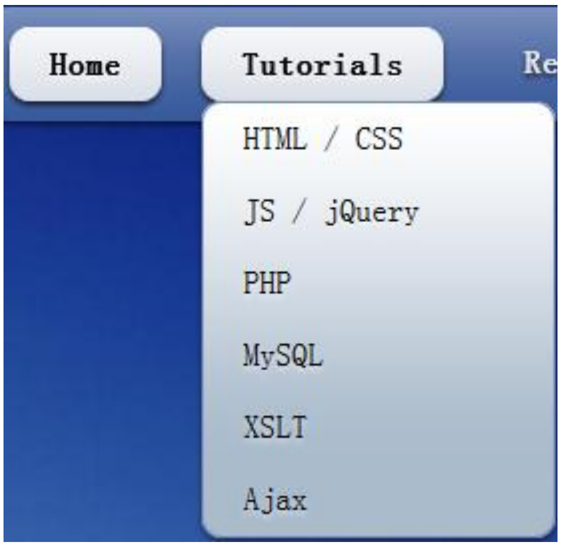
注意：记得把alert.html放在工程文件夹src目录下

● 处理下拉菜单

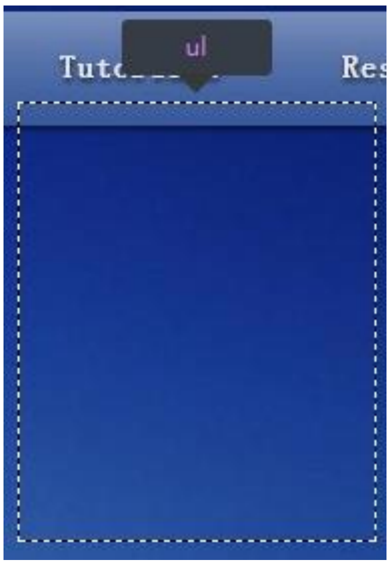
思路：采用分层处理的方法

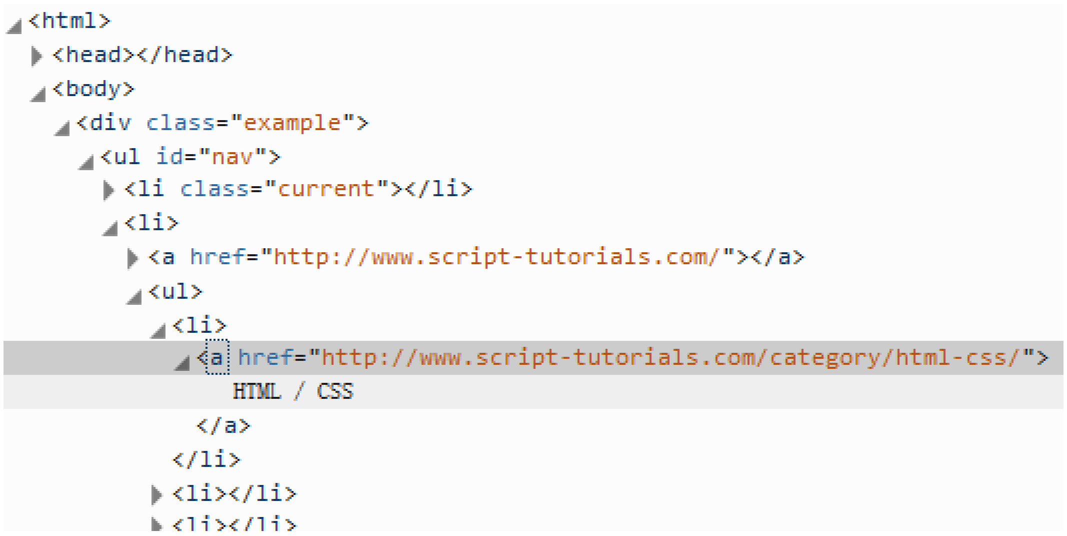
1. 鼠标移动到到界面元素上方，自动弹出下拉菜单

示例1：鼠标移动到Tutorials上方的时候，会自动弹出下拉菜单，模拟该过程并点击HTML / CSS



通过火狐可查看对应的页面元素对应的html元素，如下，白色圈圈即下拉面板对应的元素就是ul



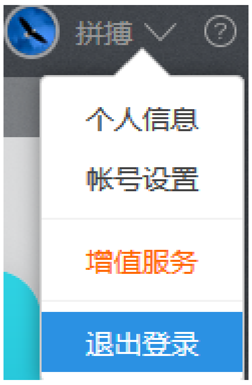


```
<html>
  <head></head>
  <body>
    <div class="example">
      <ul id="nav">
        <li class="current"></li>
        <li>
          <a href="http://www.script-tutorials.com/"></a>
          <ul>
            <li>
              <a href="http://www.script-tutorials.com/category/html-css/">
                HTML / CSS
              </a>
            </li>
            <li></li>
            <li></li>
```

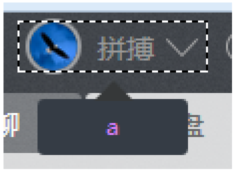
```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time, os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    driver.get("http://www.script-tutorials.com/demos/87/index.html")
    driver.implicitly_wait(10)

    #注意：针对这种鼠标移动到页面，自动弹出菜单的，用css或xpath，id等直接定位，是无法一次到位的
    #css
    #m=driver.find_element_by_css_selector('a[href="http://www.script-tutorials.com/category/html-css/"]').click() # 注意：会报错
    #xpath

    #driver.find_element_by_xpath('//a[@href="http://www.script-tutorials.com/category/html-css/"]').click()# 注意：会报错

    #定位下拉菜单面板(注意：和那个Tutorials无关，所以定位的是不是Tutorials)
    ul = driver.find_element_by_id('nav')

    #定位到 html-css菜单项所在的小面板
    li=ul.find_element_by_css_selector('li:nth-child(2)')

    #定位到html-css菜单项并点击
    a=li.find_element_by_css_selector('li>a').click()

    time.sleep(3)
    driver.quit()
```

测试页面：http://www.script-tutorials.com/demos/87/index.html

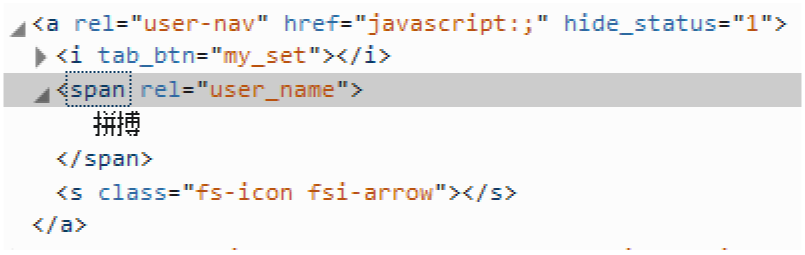
示例2：鼠标移动到“拼搏”，“头像“，”向下箭头“，都会自动弹出下拉菜单，现在模拟该操作并点击退出登录



同上列一样，我们先找存放下拉菜单的面板元素

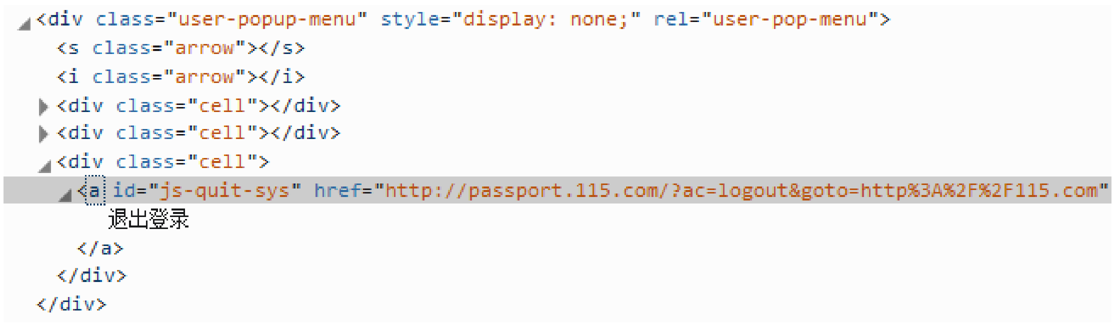


对应的html元素代码如下



```
<a rel="user-nav" href="javascript:;" hide_status="1">
  <i tab_btn="my_set"></i>
  <span rel="user_name">
     拼搏
  </span>
  <s class="fs-icon fsi-arrow"></s>
</a>
```

接着找 “退出登录”元素，如下，



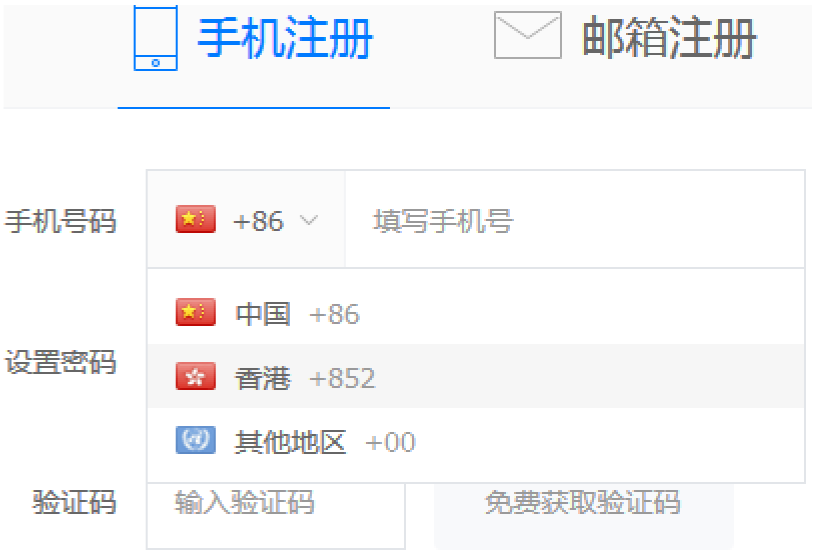
```
<div class="user-popup-menu" style="display: none;" rel="user-pop-menu">
  <s class="arrow"></s>
  <i class="arrow"></i>
  <div class="cell"></div>
  <div class="cell"></div>
  <div class="cell">
    <a id="js-quit-sys" href="http://passport.115.com/?ac=logout&goto=http%3A%2F%2F115.com"
      退出登录
    </a>
  </div>
</div>
```

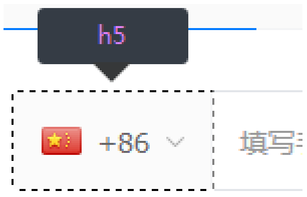
和上例不同的地方在哪里？ “菜单项”和“菜单面板”元素并不是“父子”关系，接着按照示例1的方法进行了实验，结果发现，模拟鼠标移动到元素'span[rel="user_nav"]',并没弹出下拉菜单面板，怎么办？见下面，移动到面板所在子元素比如“拼搏”，这下就好了

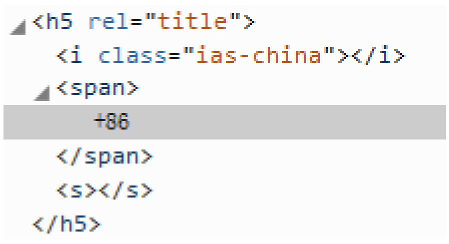
```
#coding=utf-8
from selenium import webdriver
from selenium.webdriver.common.action_chains import ActionChains
import time

#主程序
```

```
if __name__ == '__main__':
    driver = webdriver.Firefox()
    driver.maximize_window()

    url = 'http://www.115.com'
    driver.get(url)

    driver.implicitly_wait(20)

    #############115帐号登录 115网盘-不勾选5天内免登陆#############
    account_input = driver.find_element_by_id('js-account')
    account_input.clear()

    account_input.send_keys('24636313')
    passwd_input = driver.find_element_by_id('js-passwd')

    passwd_input.clear()

    passwd_input.send_keys('1017fenxiang')

    driver.find_element_by_id('js-submit').click()

    ###########退出115#############
    time.sleep(5)

    chain =ActionChains(driver)

    #鼠标移动到"下拉菜单面板", 目的在于弹出下拉菜单面板
    #span = driver.find_element_by_css_selector('span[rel="user_nav"]') #注意：
这里不起作用

    #鼠标移动到面板下的子元素：拼搏, 目的在于弹出下拉菜单面板
    span = driver.find_element_by_css_selector('span[rel="user_name"]')
chain.move_to_element(span).perform()

    #点击退出登录（弹出面板后就以直接以id等方式查找了
    driver.find_element_by_id('js-quit-sys').click()

    time.sleep(5)
    # 退出浏览器驱动并关闭浏览器窗口
    driver.quit()
```

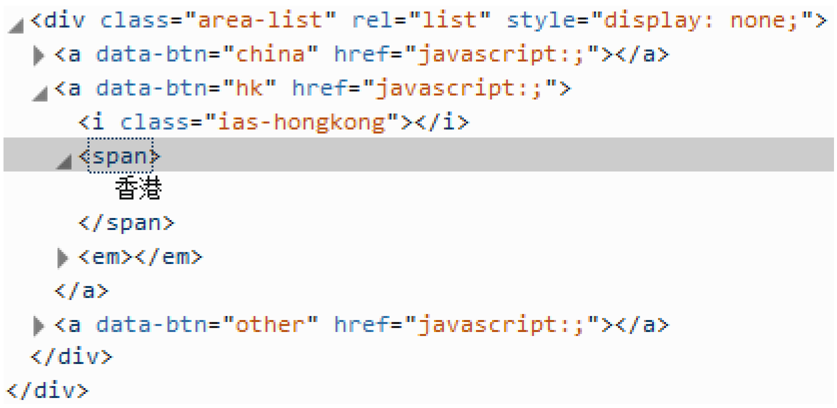
示例3：115网盘的注册页面，鼠标移动到+86会自动弹出下拉列表，模拟该操作并点击香港







```
<h5 rel="title">
  <i class="ias-china"></i>
  <span>
     +86
  </span>
  <s></s>
</h5>
```



```
<div class="area-list" rel="list" style="display: none;">
  <a data-btn="china" href="javascript:;"></a>
  <a data-btn="hk" href="javascript:;">
    <i class="ias-hongkong"></i>
    <span>
      香港
    </span>
    <em></em>
  </a>
  <a data-btn="other" href="javascript:;"></a>
</div>
</div>
```

```
# -*- coding: utf-8 -*-

from selenium import webdriver
from selenium.webdriver.common.action_chains import ActionChains
import time

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    driver.get('http://www.115.com')
    current_handle = driver.current_window_handle
    driver.find_element_by_link_text('免费注册').click()

    handles = driver.window_handles
for handle in handles:
if current_handle != handle:
           driver.switch_to_window(handle)

    chain = ActionChains(driver)
    #定位地区下拉列表
    area_list = driver.find_element_by_css_selector('h5[rel="title"]')
    chain.move_to_element(area_list).perform()
    driver.implicitly_wait(5)  #注意：如注释该语句，下面的执行经常会出现找不到
元素的情况，换成time.sleep(5)也不行

    #点击香港下拉菜单项
    driver.find_element_by_css_selector('a[data-btn="hk"]').click()
    driver.close() #关闭注册页面

    driver.switch_to_window(current_handle) #切换当前页面为原来的页面
    time.sleep(3)
    driver.quit()
```

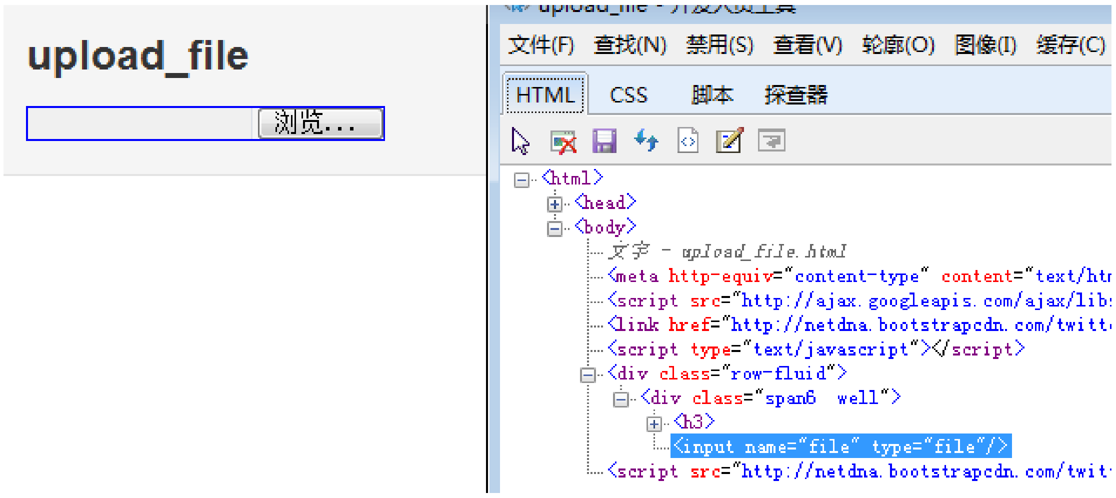
说明：注意这类情况

● 处理文件上传

示例：模拟文件上传

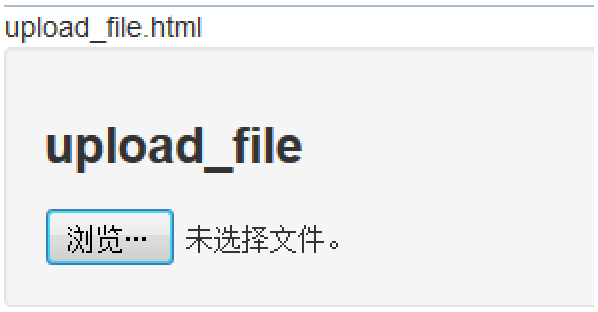
思路：定位上传按钮，通过send_keys添加本地文件路径就可以了

ie下：

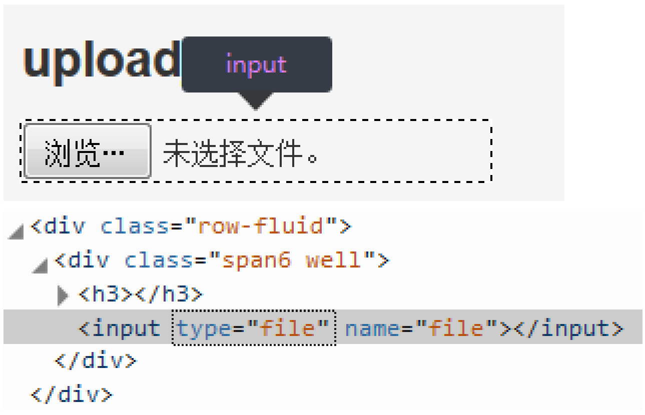


```
<html>
  <head>
  <body>
    文字 - upload_file.html
    <meta http-equiv="content-type" content="text/htr
    <script src="http://ajax.googleapis.com/ajax/lib:
    <link href="http://netdna.bootstrapcdn.com/twitt
    <script type="text/javascript"></script>
    <div class="row-fluid">
      <div class="span6  well">
        <h3>
        <input name="file" type="file"/>
    <script src="http://netdna.bootstrapcdn.com/twit
```

火狐下：


upload_file.html

upload_file



```
<div class="row-fluid">
  <div class="span6 well">
    <h3></h3>
    <input type="file" name="file"></input>
  </div>
</div>
```

```python
# -*- coding: utf-8 -*-

from selenium import webdriver
import time,os

if __name__ == "__main__":
    driver = webdriver.Ie()
    file_path = os.path.abspath('upload_file.html')
    driver.get(file_path)

    driver.implicitly_wait(20)

    # 定位上传按钮，添加本地文件即file_path.
    driver.find_element_by_name('file').send_keys('d:\\test.txt')

    time.sleep(5)

    driver.quit()
```

注意：这里没做判断，要是文件不存在，会很糟糕，一直弹出提示。。。

代码改进：

```python
# coding= utf-8
from selenium import webdriver
import os
import time
from exceptions import Exception

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('upload_file.html')
    driver.get(url)

    driver.implicitly_wait(20)

    keys = 'd:\\test.txt'

    #判断keys是否为目录
ifTrue == os.path.isdir(file_path): #如果为目录
raise Exception("ee")

    #判断文件是否存在
ifFalse == os.path.exists(file_path): #如果文件不存在
raise  Exception("ee")
else:
       driver.find_element_by_name("file").send_keys(file_path)

    time.sleep(4)
    driver.quit()
```

注意：记得把"upload_file.html“文件放在src目录下

- 使用javascript处理元素

可执行任何javascript来查找元素，并且只要你返回的是一个DOM元素，它将被自动转换为WebElement对象

函数说明

excute_script(script, *args)

函数功能：在当前窗口/框架，同步执行javaScript

函数参数：

script:要执行的javaScript

*args:参数，适用任何JavaScript脚本

例如（基于某个包含jQuery的网页）：

```
element = driver.execute_script("return $('.shouke')[0]")
```

js的执行分两种情况：

- ✧ 在页面上直接执行js
- ✧ 在某个已经定位的元素上执行js

✧ 在页面上直接执行js

1、 操作浏览器滚动条

场景一：注册时的法律条文需要阅读，判断用户是否阅读完的标准是：滚动条是否拉动到最底下

场景二：要操作的页面元素不再视线范围，无法操作，需要拖动滚动条

用于标识滚动条位置的代码

```
<body onload=”docment.body.scrollTop=0 ”>
<body onload=”document.body.scrollTop=100000 ”>
```

说明：

如果滚动条在最上方的话，scrollTop=0,要想使用滚动条在最下方，可以设置 scrollTop=100000

```
js = “var q=document.getElementById(‘id’).scrollTop = 10000”
driver.execute_script(js)
```

示例：

以操作百度搜索结果页为例（在页面上执行js）

```
# -*- coding: utf-8 -*-

from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Ie()

    driver.get('http://www.baidu.com')
    driver.implicitly_wait(20)

    #搜索
    driver.find_element_by_id('kw1').send_keys(u'授客')
    driver.find_element_by_id('su1').click()

    time.sleep(2)

#将页面滚动条拖动到底部
    js = 'document.documentElement.scrollTop=10000'
    driver.execute_script(js)
    time.sleep(2)

#滚动条移动到页面的顶部
    js = 'var q=document.documentElement.scrollTop=0'
    driver.execute_script(js)
    driver.quit()
```

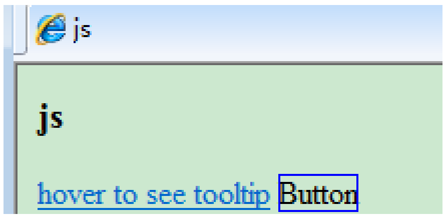
2、 在打开页面中弹窗

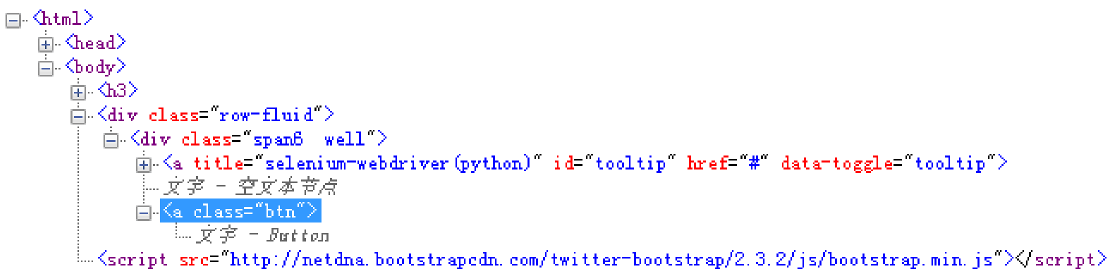
```
# coding= utf-8
from selenium import webdriver
import os
import time

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()

    url = os.path.abspath('testjs.html')
    driver.get(url)
    driver.implicitly_wait(10)

    js = 'alert("我是警告框！！")'
    driver.execute_script(js)

    time.sleep(1)
    driver.switch_to_alert().accept()

    time.sleep(3)
    driver.quit()
```

testjs.html仅是个简单的页面，放在src目录下。

✧ 在已经定位的元素上执行js

示例1：隐藏页面元素Button



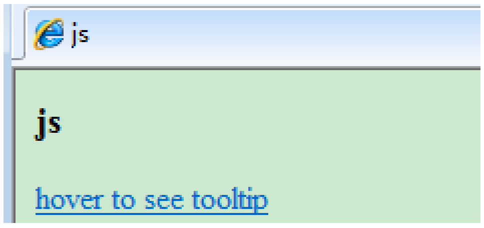


```
<html>
  <head>
  <body>
    <h3>
    <div class="row-fluid">
      <div class="span6  well">
        <a title="selenium-webdriver(python)" id="tooltip" href="#" data-toggle="tooltip">
        文字 - 空文本节点
        <a class="btn">
          文字 - Button
    <script src="http://netdna.bootstrapcdn.com/twitter-bootstrap/2.3.2/js/bootstrap.min.js"></script>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time,os
```

```
if __name__ == "__main__":
    driver = webdriver.Ie()
    file_path = os.path.abspath("js.html")
    driver.get(file_path)
    driver.implicitly_wait(20)  #

    # 通过js隐藏选中的元素方法一
    # driver.execute_script('$("#tooltip").fadeOut();')

    # 第二种方法
    button = driver.find_element_by_class_name('btn')
    driver.execute_script('$(arguments[0]).fadeOut()', button)
    time.sleep(5)

    driver.quit()
```

执行结果：



说明：
arguments对象，它是调用对象的一个特殊属性，用来引用Arguments对象。
fadeOut() 方法使用淡出效果来隐藏被选元素，假如该元素是隐藏的

注意：记得把js.html放在工程文件src目录下。

● 窗口(Window)或框架(Frame)切换
✧ 切换窗口
示例：
```
<a href="somewhere.html" target="windowName">Click here to open a new window</a>
driver.switch_to.window("windowName")
```
说明：可通过打开窗口的javascript或超链接查看窗口名字，如上
或者
```
for handle in driver.window_handles:
    driver.switch_to.window(handle)
```

示例：切换窗口
```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time
import os
```

```
if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('window1.html')
    driver.get(url)
    driver.implicitly_wait(5)

    #open new window
    driver.find_element_by_partial_link_text('shouke').click()

    time.sleep(1)

    #switch to new window
    driver.switch_to.window('shouke')

    driver.find_element_by_partial_link_text('shouke').click()

    #switch to new window:授客的博客
    driver.switch_to.window('shouke_blog')
    time.sleep(5)

    #return to the old window
    driver.switch_to.window('shouke')

    time.sleep(5)
    driver.quit()
```

注意：

1.记得把window1.html,window2.html放到工程文件src目录下

2.注意如果打开新窗口后，如不用driver.switch_to.window(windowName)方法，在新页面查找元素，会出现找不到元素的情况

示例：切换窗口

```
<html>

<head>
<meta http-equiv="Content-type" content="text/html;charset=gb2312" />
</head>

<p>
<a href="http://ishouke.blog.sohu.com/" target="_blank">shouke's blog</a>
</p>
</body>
</html>
```

```
# -*- coding: utf-8 -*-
from selenium import webdriver
```

```
import time
import os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    url = os.path.abspath('blank_link.html')
    driver.get(url)

    #get current window handle
    current_handle = driver.current_window_handle

    driver.find_element_by_tag_name('a').click()
    time.sleep(5)

    #get all the window handles
    handles = driver.window_handles

    #iterate over every open window
for handle in handles:
if handle != current_handle:   #compare handle with current_handle to find
new window
          driver.switch_to_window(current_handle)   # switch to old
window

    time.sleep(5)
    driver.quit()
```

注意：

1.记得把blank_link.html方到当前工程文件夹src目录下。

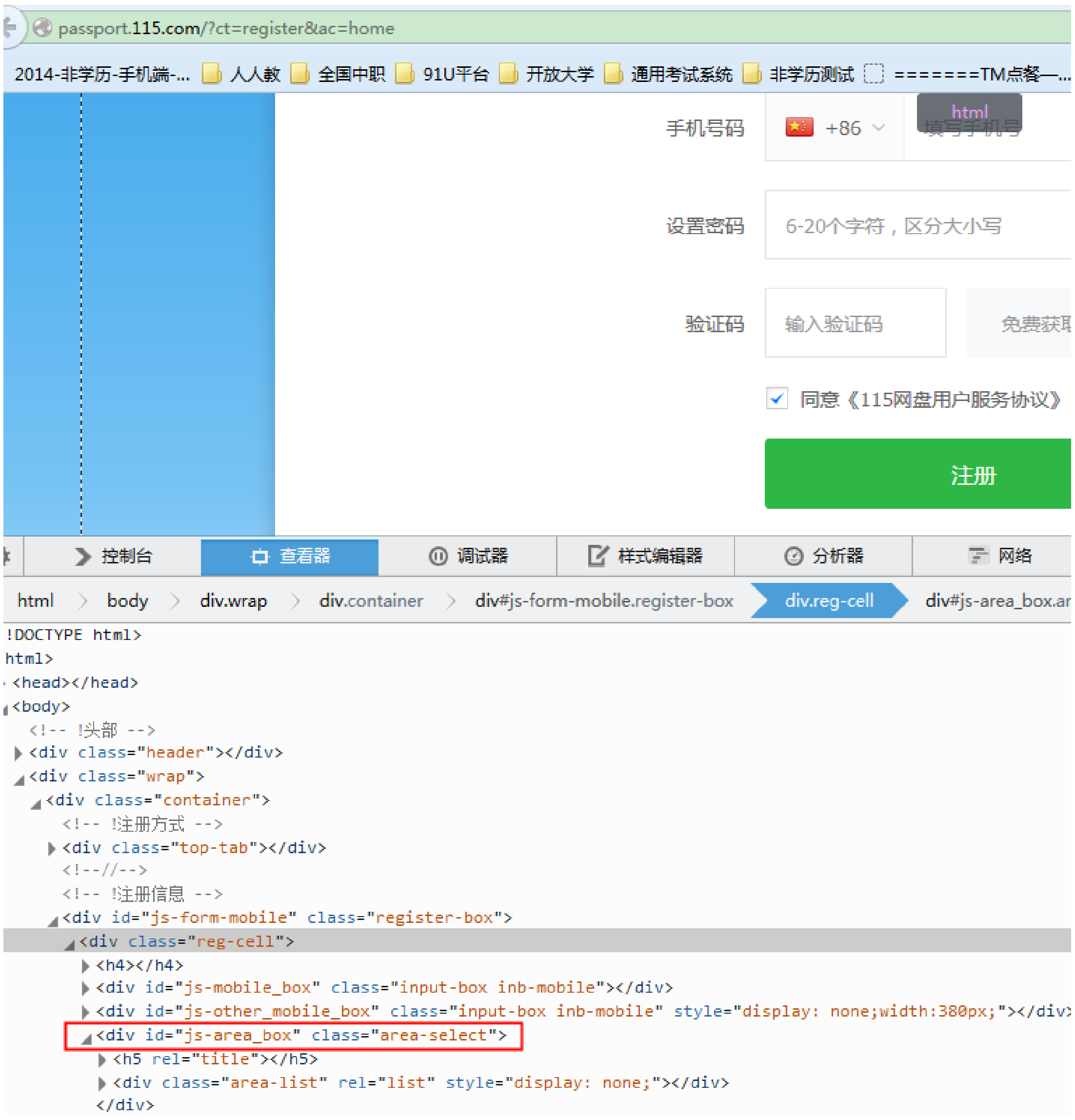
2.通常当通过某个带属性target="_blank"的超链接打开新窗口时会用到这个

示例2：切换窗口

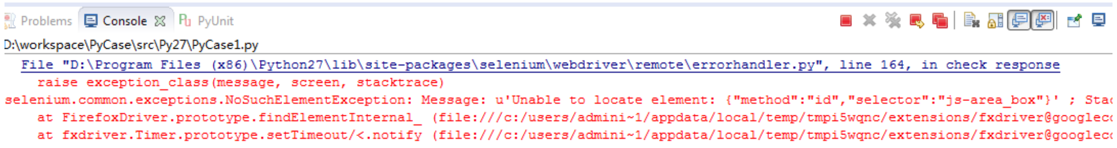
```
# -*- coding: utf-8 -*-

from selenium import webdriver
import time,os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()

    driver.get('http://www.115.com')
    driver.implicitly_wait(5)
```

```
#打开注册页面
driver.find_element_by_link_text('免费注册').click()

#注册页面中查找元素
driver.find_element_by_id('js-area_box')

time.sleep(3)
driver.quit()
```

结果：提示找不到元素，，但是明明有呀


passport.115.com/?ct=register&ac=home
2014-非学历-手机端-... 人人教 全国中职 91U平台 开放大学 通用考试系统 非学历测试 =======TM点餐—...
手机号码
+86
html
填写手机号
设置密码
6-20个字符，区分大小写
验证码
输入验证码
免费获取
同意《115网盘用户服务协议》
注册
控制台
查看器
调试器
样式编辑器
分析器
网络
html
body
div.wrap
div.container
div#js-form-mobile.register-box
div.reg-cell
div#js-area_box.ar

```
!DOCTYPE html>
html>
 <head></head>
 <body>
   <!-- !头部 -->
  <div class="header"></div>
  <div class="wrap">
   <div class="container">
     <!-- !注册方式 -->
    <div class="top-tab"></div>
     <!--//-->
     <!-- !注册信息 -->
    <div id="js-form-mobile" class="register-box">
     <div class="reg-cell">
      <h4></h4>
      <div id="js-mobile_box" class="input-box inb-mobile"></div>
      <div id="js-other_mobile_box" class="input-box inb-mobile" style="display: none;width:380px;"></div>
      <div id="js-area_box" class="area-select">
       <h5 rel="title"></h5>
       <div class="area-list" rel="list" style="display: none;"></div>
      </div>
```



```
D:\workspace\PyCase\src\Py27\PyCase1.py
  File "D:\Program Files (x86)\Python27\lib\site-packages\selenium\webdriver\remote\errorhandler.py", line 164, in check_response
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.NoSuchElementException: Message: u'Unable to locate element: {"method":"id","selector":"js-area_box"}' ; Sta
    at FirefoxDriver.prototype.findElementInternal_ (file:///c:/users/admini~1/appdata/local/temp/tmpi5wqnc/extensions/fxdriver@googlec
    at fxdriver.Timer.prototype.setTimeout/<.notify (file:///c:/users/admini~1/appdata/local/temp/tmpi5wqnc/extensions/fxdriver@googlec
```

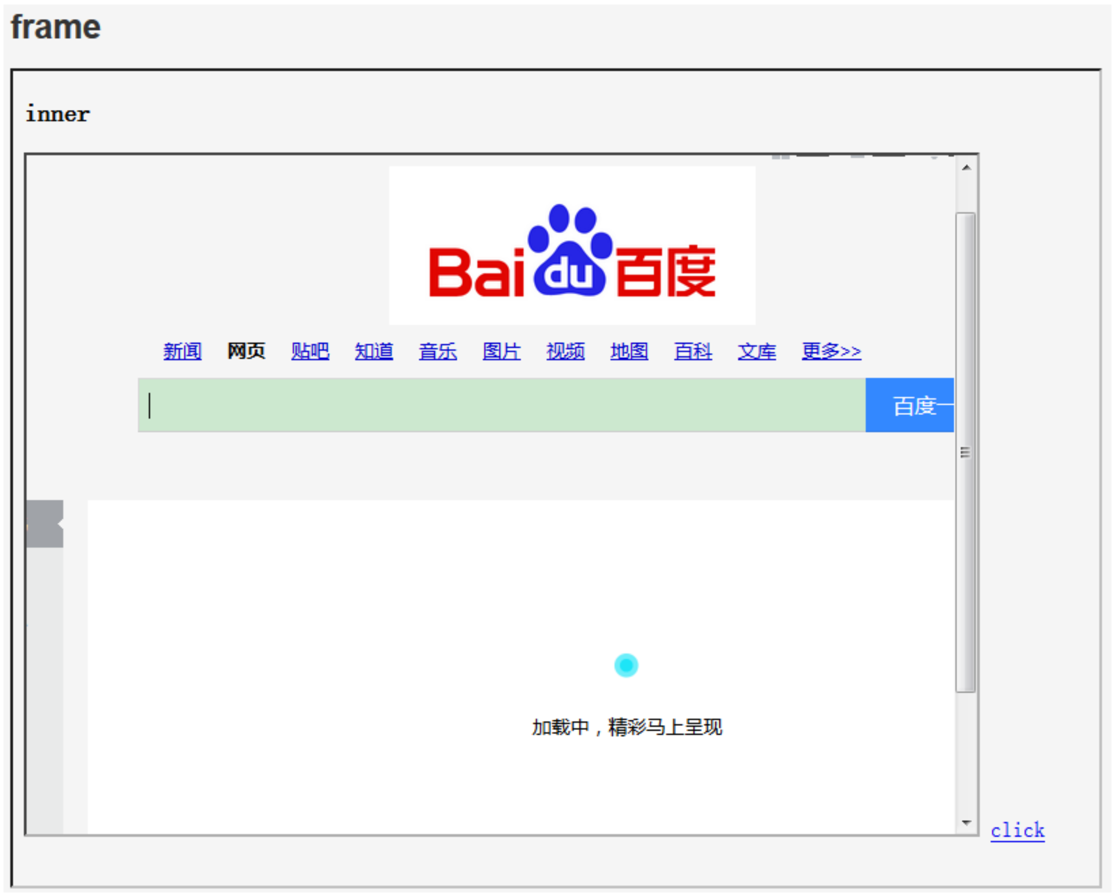
解决方案：

```
# -*- coding: utf-8 -*-

from selenium import webdriver
import time,os

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    driver.get('http://www.115.com')
    driver.implicitly_wait(5)

    #获取当前窗口句柄
    current_handle = driver.current_window_handle

    #打开注册页面
    driver.find_element_by_link_text('免费注册').click()

    #捕获所有窗口的句柄
    handles = driver.window_handles

    #查找新窗口(免费注册页面所在窗口)句柄，因为仅打开一个窗口，所以如果和原窗口句柄
不一样，那肯定是新窗口句柄
for handle in handles:
if handle != current_handle:
          driver.switch_to_window(handle)

    #注册页面中查找元素
    driver.find_element_by_id('js-area_box')

    #返回原来的窗口(http://www.115.com页面所在窗口)
    driver.switch_to_window(current_handle)

    #输入帐号
    driver.find_element_by_id('js-account').send_keys('test')

    time.sleep(3)
    driver.quit()
```

✧ 切换Frame

driver.switch_to_frame(frame)

示例：


frame

inner

```python
# -*- coding: utf-8 -*-

from selenium import webdriver
import time
import os

if __name__ == "__main__":
    driver = webdriver.Ie()

    file_path = os.path.abspath("frame.html")
    driver.get(file_path)
    driver.implicitly_wait(20)  #

    # first, find iframe1 （id = f1）
    driver.switch_to_frame("f1")

    # the found it’s sub franem:iframe2（id= f2）
    driver.switch_to_frame("f2")

    #then you can operate elements in frame2 normally
    driver.find_element_by_id("kw1").send_keys("selenium")
    driver.find_element_by_id("su1").click()
    time.sleep(5)
    driver.quit()
```

注意：记得把frame.html和inner.html放在工程文件夹src目录下

➢ 添加等待时间

- 显示等待（Explicit Waits，功能效果等同Implicit Waits)

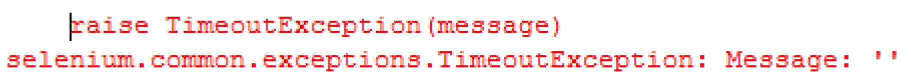
规定时间内，只要等待多久就只等待多久

```
# coding= utf-8
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
if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.get('http://ishouke.blog.sohu.com/')
    driver.maximize_window()
try:
        element = WebDriverWait(driver,
10).until(EC.presence_of_element_located((By.ID,'statusImg')))
    print('found element')
finally:
        driver.quit()
```

说明：

WebDriverWait(driver, 10)

等待达到10秒时，如果还找不到指定元素，则抛出一个TimeoutException异常，



```
    raise TimeoutException(message)
 selenium.common.exceptions.TimeoutException: Message: ''
```

如果等待时间未达到10秒，那么找到元素后停止等待，反回找到的元素

until(EC.presence_of_element_located((By.CSS_SELECTOR,css_selector)))

给定预期条件，until(Expected Conditions) 见名知意，指定时间范围内等待，直到预期条件满足，

例：Expected Conditions-等待元素(登录按钮>id：js-submit)出现并且可点击(enabled)

```
try:
        wait = WebDriverWait(driver, 10)
        wait.until(EC.element_to_be_clickable(((By.ID), 'js-submit')))
print('found element')
finally:
        driver.quit()
```

- 隐式等待（Implicit Waits）

implicit wait为了告诉wedriver，如果元素不能立即获取的情况下，在一定的时间范围内

轮询DOM.缺省设置为0，一旦设置，implicit wait设置对WebDriver对象实例起作用。隐式等待一个元素被发现或一个命令完成，这个方法每次会话只需要调用一次

```
# coding= utf-8
from selenium import webdriver
if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.get('http://ishouke.blog.sohu.com/')
    driver.maximize_window()

    driver.implicitly_wait(10) # 智能等待10秒
    driver.find_element_by_id('statusImg')
print('found element')

    driver.quit()
```

● 进程休眠

引入time模块，然后自由添加时间

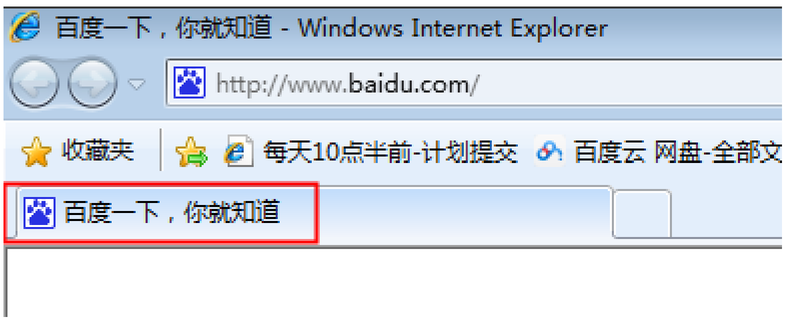
```
# coding= utf-8 #可加可不加，防止中文乱码
from selenium import webdriver
import time  #引入time模块
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.get('http://www.baidu.com/')
    time.sleep(0.3)  #休眠0.3秒
    driver.find_element_by_id('kw1').send_keys('hello selenium')
    driver.find_element_by_id('su1').click()
    time.sleep(20)  #休眠20秒
driver.quit()
```

➢ 获取driver属性

● 获取html页面title

driver.title

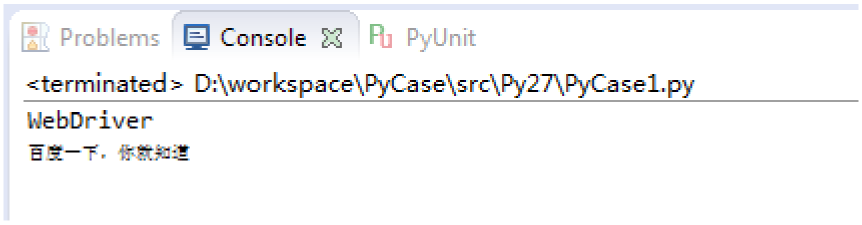
示例：打印页面**titile**



```
# coding= utf-8
from selenium import webdriver
```

```
import time

if __name__ == "__main__":
    driver = webdriver.Ie()

print(driver.title)
    driver.get('http://www.baidu.com/')
    driver.implicitly_wait(5)
print(driver.title)
    driver.find_element_by_partial_link_text('知').click()

    time.sleep(5)

    driver.quit()
```

以下是控制台输出(注意获取url前后标题的变化)



```
<terminated> D:\workspace\PyCase\src\Py27\PyCase1.py
WebDriver
百度一下，你就知道
```

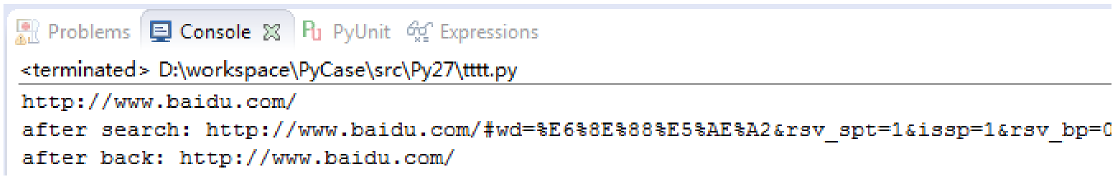
- 获取当前页面url

driver.current_url

示例：

```
# coding= utf-8
from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.get('http://www.baidu.com')
    driver.implicitly_wait(10)
    current_web_site = driver.current_url #打印当前driver所在浏览器窗口中的
网址
print(current_web_site)
    driver.find_element_by_id('kw1').send_keys(u'授客')
    driver.find_element_by_id('su1').click()

    current_web_site = driver.current_url
print('after search:  '+current_web_site)

    time.sleep(5)
    driver.back()

    current_web_site = driver.current_url
print('after back: '+current_web_site)
    time.sleep(5)
    driver.quit()
```

控制台输出



```
<terminated> D:\workspace\PyCase\src\Py27\tttt.py
http://www.baidu.com/
after search: http://www.baidu.com/#wd=%E6%8E%88%E5%AE%A2&rsv_spt=1&issp=1&rsv_bp=0
after back: http://www.baidu.com/
```

备注：打印当前页面的url，也可以如下

```
# coding= utf-8
from selenium import webdriver
if __name__ == "__main__":
    driver = webdriver.Ie()
    url = 'http://www.baidu.com'
driver.implicitly_wait(5)
print"now access %s" %(url)
    driver.get(url)
    driver.find_element_by_id('kw1').send_keys(u'授客')
    driver.find_element_by_id('su1').click()
    driver.quit()
```

- ➢ 浏览器设置
- ● 浏览器最大化

调用启动的浏览器不是全屏的，这样不会影响脚本的执行，但是有时候会影响我们“观看”脚本的执行

```
# coding= utf-8
from selenium import webdriver
import time
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.get("http://www.baidu.com")
    driver.implicitly_wait(5)  # 智能等待5秒

print"浏览器最大化"
    driver.maximize_window()  # 将浏览器最大化显示
    time.sleep(2)
    driver.find_element_by_id('kw1').send_keys(u'授客')
    driver.find_element_by_id('su1').click()
    time.sleep(3)
    driver.quit()
```

说明：可以先把浏览器调整为非全屏，然后关闭，再次打开就不是全屏的了，这样才可以看到效果

● 设置浏览器的高、宽

```
# coding= utf-8
from selenium import webdriver
import time
if __name__ == "__main__":
    driver = webdriver.Ie()
    driver.maximize_window()  #最大化窗口
    driver.get('http://ishouke.blog.sohu.com/')
    driver.implicitly_wait(5) #智能等待5秒

    #参数值以像素为单位
print"设置浏览器宽480像素、高800像素显示"
    driver.set_window_size(400, 800)
    time.sleep(3)
    driver.quit()
```

➢ 导航：历史位置

● 前进

```
driver.forward()
```

● 后退

```
driver.back()
```

示例：

```
# coding= utf-8
from selenium import webdriver
from selenium.webdriver.common.by importBy
from selenium.webdriver.support.ui import WebDriverWait #available since 
2.4.0
from selenium.webdriver.support importexpected_conditions as 
EC#avaliable since 2.26.0

import time
if __name__ == "__main__":
    #Create a new instance of the Firfox driver
    driver = webdriver.Firefox()

    #max window
    driver.maximize_window()
    #go to the baidu home page
    driver.get('http://www.baidu.com')

    #wait for three seconds
    time.sleep(2)

    #goto the news page
    driver.get('http://news.baidu.com')
    time.sleep(2)

    #back to baidu home page
    driver.back()
    time.sleep(2)

    #forward to news page
    driver.forward()
    time.sleep(2)

    driver.back()
    time.sleep(2)

    driver.quit()
```

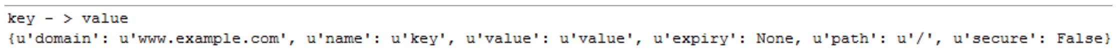
注意：前进和后退操作是针对同一个浏览器中的同一个窗口而言的，如果你打开的两个页面，每个页面各占用一个窗口，那么不能直接使用driver.back()和driver.forward()函数

➢ Cookie

示例：添加、获取、删除cookie

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Firefox()
    driver.maximize_window()
    driver.get('http://www.example.com')

    #Now set the cookie, Here's one for the entire domain
    #the cookie name here is 'key' and it's value is 'value'
    driver.add_cookie({'name':'key', 'value':'value', 'path':'/'})
    #additional keys that can be passed in here:
    #'domain' -> String,
    #'secure' -> Boolean,
    #'expiry' -> Milliseconds since the Epoch it should expire
    #Output all the available cookies for the current URL
for cookie in driver.get_cookies():
print('%s - > %s' % (cookie['name'], cookie['value']))

    #get cookie by name and print it's all information
    cookie = driver.get_cookie('key')
print(cookie)

    #delete cookies in 2 ways
    #one:By name
    driver.delete_cookie('key')

    #two:delete all of them at a time
    driver.delete_all_cookies()

    time.sleep(3)
    driver.quit()
```

控制台输出如下



```
key - > value
{u'domain': u'www.example.com', u'name': u'key', u'value': u'value', u'expiry': None, u'path': u'/', u'secure': False}
```

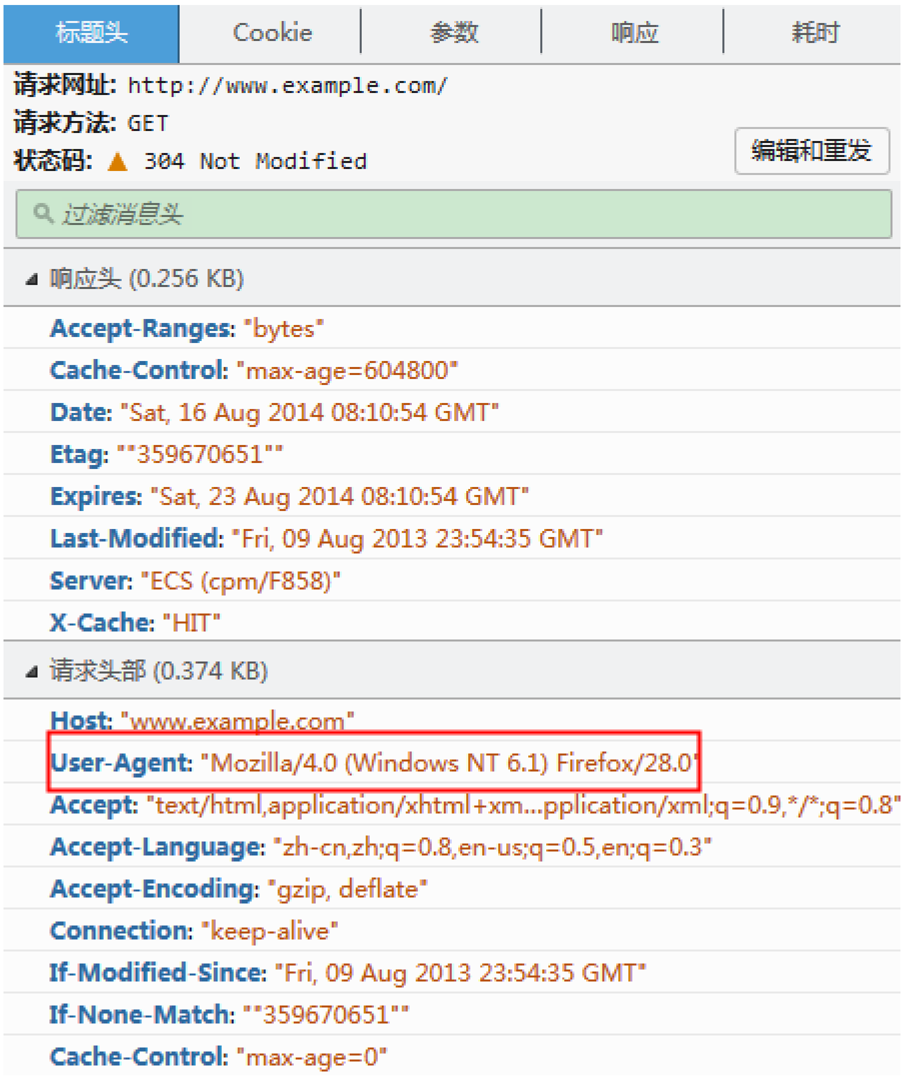
注意：
1.expiry参数的值默认为None，该参数一般是在网站有“保存密码”功能时进行使用，一般不进行设置,否则可能无法写入cookie，获取写入结果为None
2.同一个域下的同一个网站仅在bc端保存一条cookie(可在上述代码中添加多条cookie验证)

➢ 改变用户代理(User-Agent)
示例：

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time

if __name__ == "__main__":
    profile = webdriver.FirefoxProfile()
#set user-agent
    profile.set_preference('general.useragent.override', 'Mozilla/4.0
(Windows NT 6.1) Firefox/28.0')

    #create instance with profile parameter
    driver = webdriver.Firefox(profile)

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

```
time.sleep(100)
driver.quit()
```

输出结果



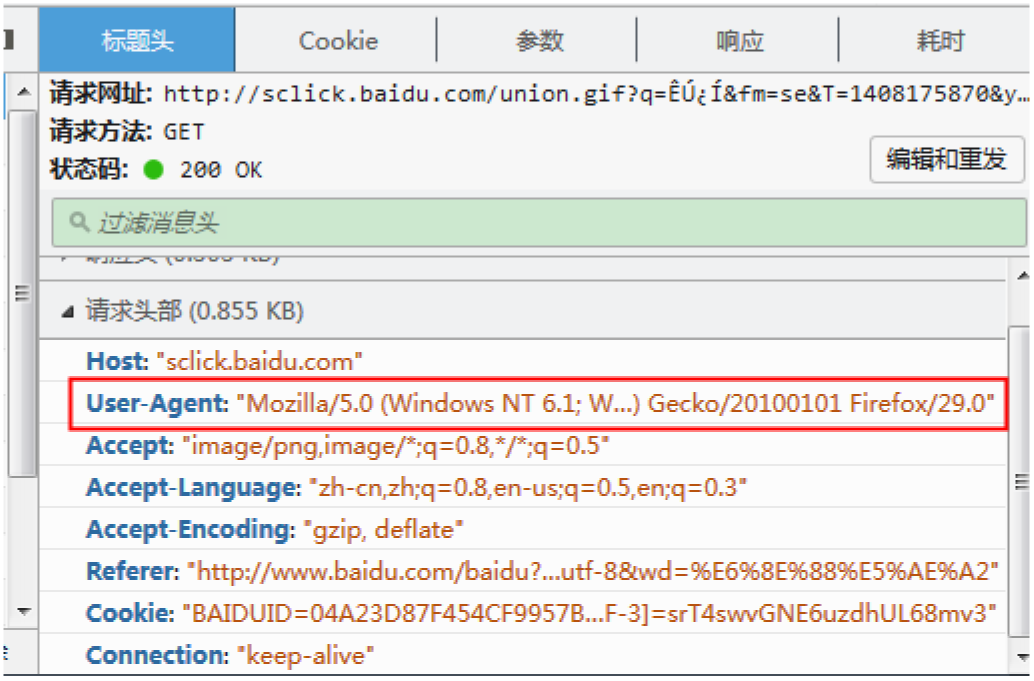
```
请求网址: http://www.example.com/
请求方法: GET
状态码: ▲ 304 Not Modified

响应头 (0.256 KB)
Accept-Ranges: "bytes"
Cache-Control: "max-age=604800"
Date: "Sat, 16 Aug 2014 08:10:54 GMT"
Etag: ""359670651""
Expires: "Sat, 23 Aug 2014 08:10:54 GMT"
Last-Modified: "Fri, 09 Aug 2013 23:54:35 GMT"
Server: "ECS (cpm/F858)"
X-Cache: "HIT"

请求头部 (0.374 KB)
Host: "www.example.com"
User-Agent: "Mozilla/4.0 (Windows NT 6.1) Firefox/28.0"
Accept: "text/html,application/xhtml+xm...pplication/xml;q=0.9,*/*;q=0.8"
Accept-Language: "zh-cn,zh;q=0.8,en-us;q=0.5,en;q=0.3"
Accept-Encoding: "gzip, deflate"
Connection: "keep-alive"
If-Modified-Since: "Fri, 09 Aug 2013 23:54:35 GMT"
If-None-Match: ""359670651""
Cache-Control: "max-age=0"
```

说明：

1.用户代理是指浏览器,它的信息包括硬件平台、系统软件、应用软件和用户个人偏好.同时用户代理还代表着搜索引擎。

2.许多浏览器和下载软件会伪装 user agent 来回避某些侦测特定浏览器才能读取的网站。比如你用Firefox浏览一个网站，但该网站用Firefox浏览的话页面内容会显示不正常，该网站就会弹出请用IE浏览的信息框！这就是User-Agent起的作用

3.User-Agent也作为http请求头的一部分，火狐下可通过firebug查看user-agent



请求网址: http://sclick.baidu.com/union.gif?q=ÊÚ¿Í&fm=se&T=1408175870&y...
请求方法: GET
状态码: ● 200 OK

请求头部 (0.855 KB)

Host: "sclick.baidu.com"
User-Agent: "Mozilla/5.0 (Windows NT 6.1; W...) Gecko/20100101 Firefox/29.0"
Accept: "image/png,image/*;q=0.8,*/*;q=0.5"
Accept-Language: "zh-cn,zh;q=0.8,en-us;q=0.5,en;q=0.3"
Accept-Encoding: "gzip, deflate"
Referer: "http://www.baidu.com/baidu?...utf-8&wd=%E6%8E%88%E5%AE%A2"
Cookie: "BAIDUID=04A23D87F454CF9957B...F-3]=srT4swvGNE6uzdhUL68mv3"
Connection: "keep-alive"

➢ driver详细与权衡

● HtmlUnit Driver

最快，最轻的WebDriver实现，基于HtmlUnit。HtmlUnit是基于java实现的无GUI的浏览器对于任何语言绑定(java除外)，Selenium Server需要用到HtmlUnit driver

```
driver = webdriver.Remote(u'http://localhost:4444/wd/hub',
webdriver.DesiredCapabilities.HTMLUNIT.copy())
```

优点:

webdriver最快的实现
纯java实现，且平台独立
支持javascript

缺点

模拟浏览器的javascript行为

主流浏览器都没使用HtmlUnit使用的javascript引擎。如果使用HtmlUnit测试javascript和使用其它浏览器进行的测试极不相同。

当我们说“javascript”，实际说的是“javascript和DOM”。尽管w3c定义了DOM，但是每个浏览器有自己的特点并且在jvascript的DOM实现和javascript交互都存在不同。虽然HtmlUnit有一个完整的DOM实现并对使用javascript有很好的支持，但是存在上述问题，所以目前版本，HtmlUnit默认情况下禁用JavaScript。

开启 JavaScript

```
D:\Program Files (x86)\Python27>java -jar
 selenium-server-standalone-2.40.0.jar
```

```
driver=webdriver.Remote("http://localhost:4444/wd/hub",
                           webdriver.DesiredCapabilities.HTMLUNITWITHJS)
```

- Firefox Driver

支持浏览器版本Windows,Mac,Lniux: 火狐3.6, 10, 最新版

driver = webdriver.Firefox()

优点：

    在真实浏览器中运行并且支持javascript

    比Internet Explorer Driver运行得更快

缺点：

    比HtmlUnit Dirver运行得更慢

修改火狐配置。

可对火狐profile进行获取并修改，比如上述修改user-agent的例子，再如下，本地事件在Linux版本的firefox上被认为是稳定之前，它们默认被禁用，可手动开启

开启native events

```
profile = webdriver.FirefoxProfile()
profile.native_events_enabled = True
driver = webdriver.Firefox(profile)
```

注：不需要单独下载火狐driver,driver包含在selenium-server-stanalone.jar 包中

更多详细信息：http://code.google.com/p/selenium/wiki/FirefoxDriver

- Internet Explorer Driver

支持浏览器版本xp IE6\7\8， win7 9

driver = webdriver.Ie()

优点：

    在一个真实浏览器中运行，支持所有javascript

缺点：

    仅用于windows

    运行相对较慢

    大部分版本对XPath的本地支持不是很好

    IE6,IE5对CSS的本地支持不是很好

    IE8,IE9本地支持CSS Selector，但是不完全支持CSS3

注：需要单独下载ie driver

更多详细信息：http://code.google.com/p/selenium/wiki/InternetExplorerDriver

- Chome Driver

driver = webdriver.Chrome()

优点：

运行在一个真实浏览器中并且支持javascript

Chrome是一个基于Webkit的浏览器，所以它允许你确认你的网站是否支持Safari浏览器。值得注意的是，Chrome使用自己的V8 javaScript引擎，而不是Safari的Nitro引擎，javascript的执行结果可能不相同

缺点：

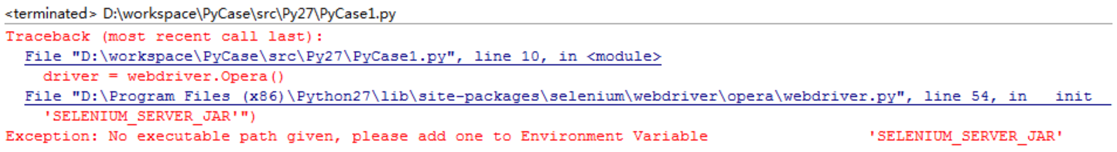
比HtmlUnit Driver运行慢

注：需要单独下载chome driver，并放在系统环境变量path包含的某个目录下
driver下载地址：http://code.google.com/p/chromium/downloads/list
更多详细信息：http://code.google.com/p/selenium/wiki/ChromeDriver

- Opera Driver

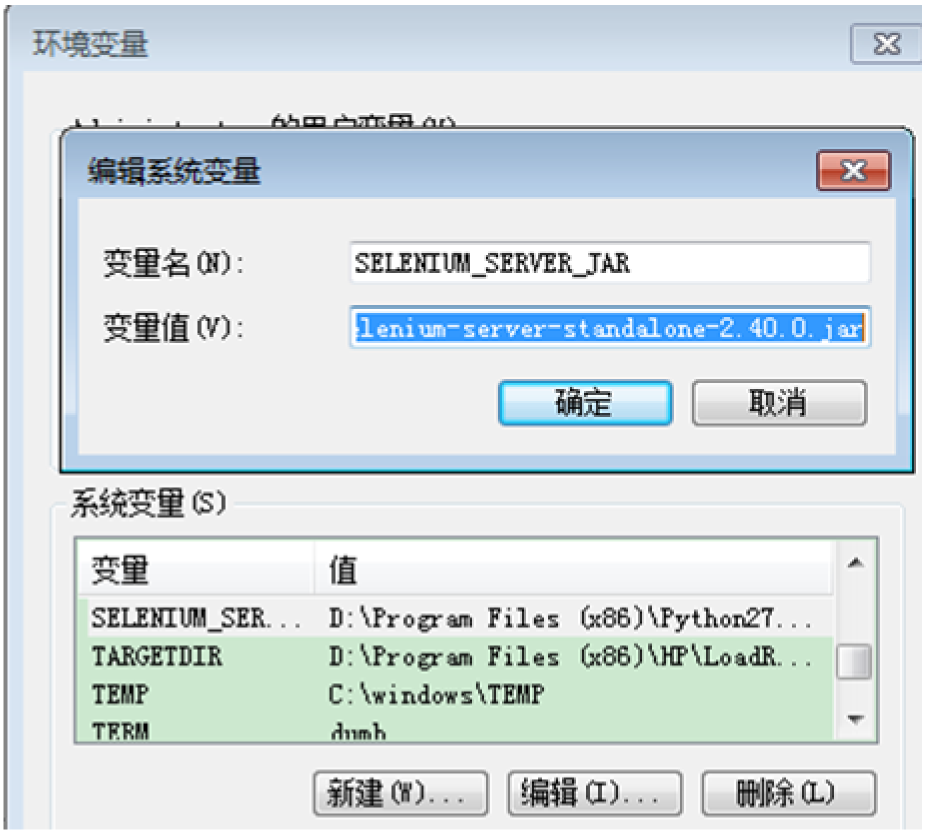
```
driver = webdriver.Opera()
```

调用出问题，如下图



```
<terminated> D:\workspace\PyCase\src\Py27\PyCase1.py
Traceback (most recent call last):
  File "D:\workspace\PyCase\src\Py27\PyCase1.py", line 10, in <module>
    driver = webdriver.Opera()
  File "D:\Program Files (x86)\Python27\lib\site-packages\selenium\webdriver\opera\webdriver.py", line 54, in __init__
    'SELENIUM_SERVER_JAR'")
Exception: No executable path given, please add one to Environment Variable         'SELENIUM_SERVER_JAR'
```

解决方案：设置环境变量

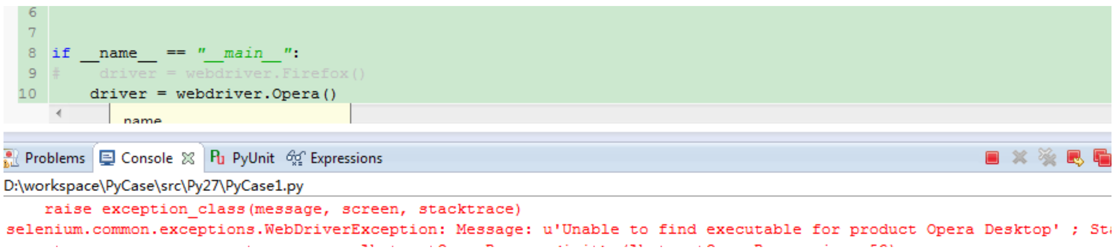


环境变量
编辑系统变量
变量名(N): SELENIUM_SERVER_JAR
变量值(V): lenium-server-standalone-2.40.0.jar
确定
取消
系统变量(S)
新建(W)...
编辑(I)...
删除(L)

变量	值
SELENIUM_SER...	D:\Program Files (x86)\Python27...
TARGETDIR	D:\Program Files (x86)\HP\LoadR...
TEMP	C:\windows\TEMP
TERM	dumb

即SELENIUM_SERVER_JAR　D:\Program Files (x86)\Python27\selenium-server-standalone-2.40.0.jar

关闭eclipse，重新打开，运行，提示找不到桌面产品



```
if __name__ == "__main__":
#     driver = webdriver.Firefox()
    driver = webdriver.Opera()
```

```
D:\workspace\PyCase\src\Py27\PyCase1.py
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.WebDriverException: Message: u'Unable to find executable for product Opera Desktop' ; St
```

解决方法：浏览器版本太新，替换浏览器版本，11.51可支持（备注：经过测验，发现浏览器打开后无动作，具体为何？不知道，好像是selenium_standalone.jar包不是很支持）

备注：opera驱动随selenium-server-standalone或selenium-server安装而安装
更多详细信息：http://code.google.com/p/selenium/wiki/OperaDriver

- iOS Driver

详细信息：http://selendroid.io/

- Android Driver:

详细信息：http://ios-driver.github.io/ios-driver/

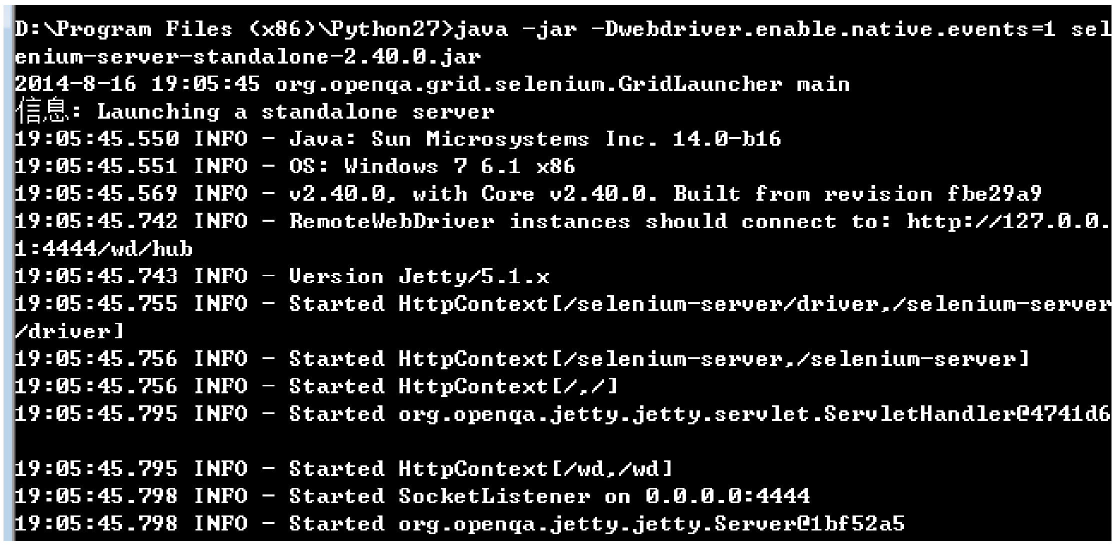
➢ 为使用RemoteDrivers运行独立Selenium Server

1. 下载selenium-server-standalone-<version>.jar和浏览器驱动
下载地址：https://code.google.com/p/selenium/downloads/list

2. 设置环境变量(如有必要)
把浏览器驱动后进行解压缩，并将解压后的文件放在某个工作目录下(以python为例，通常放在安装目录下，同python.exe在同一目录)，并设置环境变量，使得该目录包含在系统环境变量path中，这样以便于selenium server而不要做任何修改就可以处理来自驱动的请求

3. 运行server
java -jar <path_to>/selenium-server-standalone-<version>.jar

4. 开启本地事件功能(如果想的话)
-Dwebdriver.enable.native.events = 1
查看帮助
java -jar <path_to>/selenium-server-standalone-<version>.jar -help



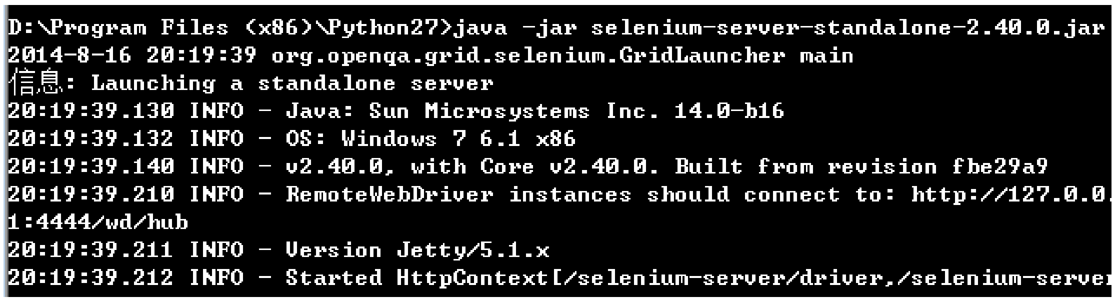
```
D:\Program Files (x86)\Python27>java -jar -Dwebdriver.enable.native.events=1 sel
enium-server-standalone-2.40.0.jar
2014-8-16 19:05:45 org.openqa.grid.selenium.GridLauncher main
信息: Launching a standalone server
19:05:45.550 INFO - Java: Sun Microsystems Inc. 14.0-b16
19:05:45.551 INFO - OS: Windows 7 6.1 x86
19:05:45.569 INFO - v2.40.0, with Core v2.40.0. Built from revision fbe29a9
19:05:45.742 INFO - RemoteWebDriver instances should connect to: http://127.0.0.
1:4444/wd/hub
19:05:45.743 INFO - Version Jetty/5.1.x
19:05:45.755 INFO - Started HttpContext[/selenium-server/driver,/selenium-server
/driver]
19:05:45.756 INFO - Started HttpContext[/selenium-server,/selenium-server]
19:05:45.756 INFO - Started HttpContext[/,/]
19:05:45.795 INFO - Started org.openqa.jetty.jetty.servlet.ServletHandler@4741d6

19:05:45.795 INFO - Started HttpContext[/wd,/wd]
19:05:45.798 INFO - Started SocketListener on 0.0.0.0:4444
19:05:45.798 INFO - Started org.openqa.jetty.jetty.Server@1bf52a5
```

➢ RemoteWebDriver

● 截图

步骤1：运行Selenium Server standalone

java -jar <path>/selenium-server-standalone-<version>.jar



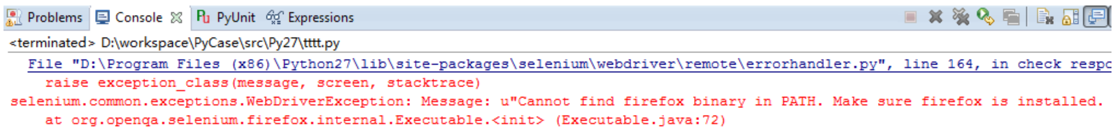
```
D:\Program Files (x86)\Python27>java -jar selenium-server-standalone-2.40.0.jar
2014-8-16 20:19:39 org.openqa.grid.selenium.GridLauncher main
信息: Launching a standalone server
20:19:39.130 INFO - Java: Sun Microsystems Inc. 14.0-b16
20:19:39.132 INFO - OS: Windows 7 6.1 x86
20:19:39.140 INFO - v2.40.0, with Core v2.40.0. Built from revision fbe29a9
20:19:39.210 INFO - RemoteWebDriver instances should connect to: http://127.0.0.
1:4444/wd/hub
20:19:39.211 INFO - Version Jetty/5.1.x
20:19:39.212 INFO - Started HttpContext[/selenium-server/driver,/selenium-serve
```

步骤2：运行程序

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time

if __name__ == "__main__":
    driver = webdriver.Remote('http://localhost:4444/wd/hub',
webdriver.DesiredCapabilities.FIREFOX.copy())
    driver.get('http://www.baidu.com')
    time.sleep(10)

    #take a screenshot and save to location 'D:/workspace/baidu.png'
    driver.get_screenshot_as_file('D:/workspace/baidu.png')
    time.sleep(3)
    driver.quit()
```

运行错误，如下：

Cannot find firefox binary in PATH. Make sure firefox is installed



```
<terminated> D:\workspace\PyCase\src\Py27\tttt.py
  File "D:\Program Files (x86)\Python27\lib\site-packages\selenium\webdriver\remote\errorhandler.py", line 164, in check_respo
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.WebDriverException: Message: u"Cannot find firefox binary in PATH. Make sure firefox is installed.
    at org.openqa.selenium.firefox.internal.Executable.<init> (Executable.java:72)
```

解决方法：
重新安装火狐浏览器，安装到默认路径，Windows下：安装到C盘

- 使用firefox profile

步骤1：运行selenium server standalone
步骤2：运行程序

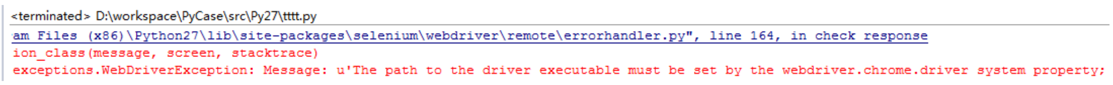
```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time

if __name__ == "__main__":
    fp = webdriver.FirefoxProfile()
    #set something on the profile...
    driver = 
webdriver.Remote(desired_capabilities=webdriver.DesiredCapabilities.F
IREFOX, browser_profile=fp)

    driver.maximize_window()
    driver.get('http://www.baidu.com')
    time.sleep(9)
    driver.get_screenshot_as_file('D:/workspace/baidu.png')
    time.sleep(3)
    driver.quit()
```

- 使用ChromeOptions

```
# -*- coding: utf-8 -*-
from selenium import webdriver
import time

if __name__ == "__main__":

    options = webdriver.ChromeOptions()
    #set some options.
    driver = 
webdriver.Remote(desired_capabilities=options.to_capabilities())
    driver.maximize_window()
    driver.get('http://www.baidu.com')
    time.sleep(10)
    driver.quit()
```

运行代码错误：

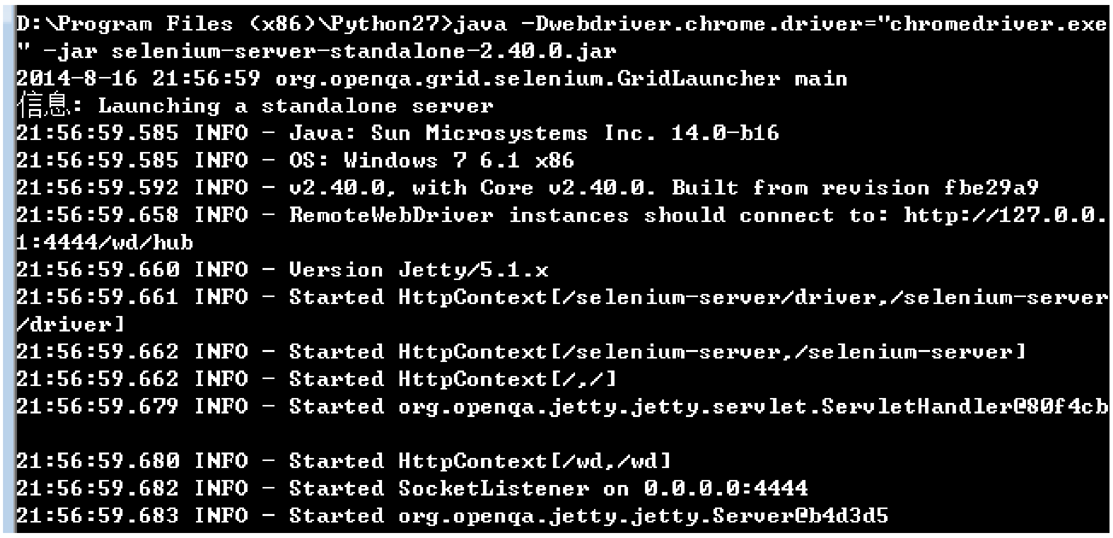
selenium.common.exceptions.WebDriverException: Message: u'The path to the driver executable must be set by the webdriver.chrome.driver system property;



```
<terminated> D:\workspace\PyCase\src\Py27\tttt.py
am Files (x86)\Python27\lib\site-packages\selenium\webdriver\remote\errorhandler.py", line 164, in check response
ion_class(message, screen, stacktrace)
exceptions.WebDriverException: Message: u'The path to the driver executable must be set by the webdriver.chrome.driver system property;
```

解决方法：

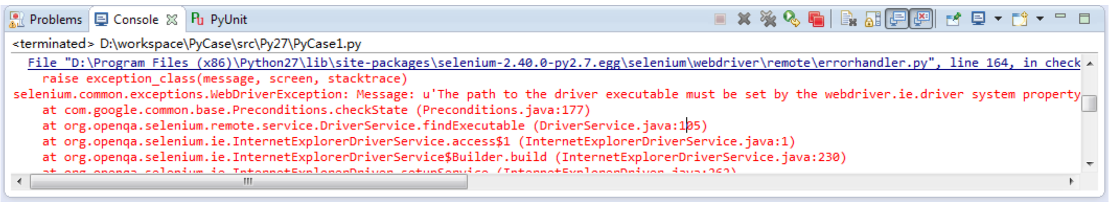
java -Dwebdriver.chrome.driver="<path_to>/chromedriver.exe" -jar <path_to>/selenium-server-standalone-2.40.0.jar



```
D:\Program Files (x86)\Python27>java -Dwebdriver.chrome.driver="chromedriver.exe
" -jar selenium-server-standalone-2.40.0.jar
2014-8-16 21:56:59 org.openqa.grid.selenium.GridLauncher main
信息: Launching a standalone server
21:56:59.585 INFO - Java: Sun Microsystems Inc. 14.0-b16
21:56:59.585 INFO - OS: Windows 7 6.1 x86
21:56:59.592 INFO - v2.40.0, with Core v2.40.0. Built from revision fbe29a9
21:56:59.658 INFO - RemoteWebDriver instances should connect to: http://127.0.0.
1:4444/wd/hub
21:56:59.660 INFO - Version Jetty/5.1.x
21:56:59.661 INFO - Started HttpContext[/selenium-server/driver,/selenium-server
/driver]
21:56:59.662 INFO - Started HttpContext[/selenium-server,/selenium-server]
21:56:59.662 INFO - Started HttpContext[/,/]
21:56:59.679 INFO - Started org.openqa.jetty.jetty.servlet.ServletHandler@80f4cb

21:56:59.680 INFO - Started HttpContext[/wd,/wd]
21:56:59.682 INFO - Started SocketListener on 0.0.0.0:4444
21:56:59.683 INFO - Started org.openqa.jetty.jetty.Server@b4d3d5
```

备注：IE下运行，也会出现类似的情况

selenium.common.exceptions.WebDriverException: Message: u'The path to the driver executable must be set by the webdriver.ie.driver system property;



```
<terminated> D:\workspace\PyCase\src\Py27\PyCase1.py
  File "D:\Program Files (x86)\Python27\lib\site-packages\selenium-2.40.0-py2.7.egg\selenium\webdriver\remote\errorhandler.py", line 164, in check
    raise exception_class(message, screen, stacktrace)
selenium.common.exceptions.WebDriverException: Message: u'The path to the driver executable must be set by the webdriver.ie.driver system property
    at com.google.common.base.Preconditions.checkState (Preconditions.java:177)
    at org.openqa.selenium.remote.service.DriverService.findExecutable (DriverService.java:105)
    at org.openqa.selenium.ie.InternetExplorerDriverService.access$1 (InternetExplorerDriverService.java:1)
    at org.openqa.selenium.ie.InternetExplorerDriverService$Builder.build (InternetExplorerDriverService.java:230)
```

解决方法(同上)：

java -Dwebdriver.ie.driver="<path_to>/IEDriverServer.exe.exe" -jar <path_to>/selenium-server-standalone-2.40.0.jar

➢ 浏览器启动控制

● 使用代理

推荐直接在机器上手工配置代理，如果需要在一个带不同配置或代理的情况下运行测试，可以按照如下代码，设置临时代理

✧ ie

```
# -*- coding: utf-8 -*-
from selenium import webdriver
```

```
import time

if __name__ == "__main__":
    PROXY = 'localhost:8080'

    #create a copy of desired capabilities object
    desired_capabilities = 
webdriver.DesiredCapabilities.INTERNETEXPLORER.copy()

    #change the proxy properties of that copy
    desired_capabilities['proxy'] = {
'httpProxy':PROXY,
'ftpProxy':PROXY,
'sslProxy':PROXY,
'noProxy':None,
'proxyType':'MANUAL',
'class':'org.openqa.selenium.Proxy',
'autodetect':False
                                  }

    #you have to use remote, otherwise you'll have to code it yourself in python 
to
    #dynamically changing the system proxy preferences
    driver = webdriver.Remote('http://localhost:4444/wd/hub', 
desired_capabilities)
    driver.maximize_window()
    driver.get('http://192.168.206.8/qcbin:8080')
    time.sleep(10)
    driver.quit()
```

注意：经过测试，似乎程序运行完后不会自动删除代理

✧ Chrome

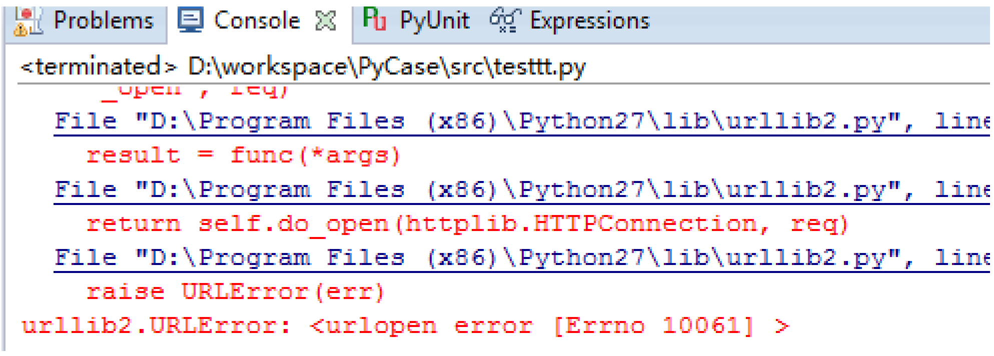
同Ie

✧ Firefox

```
# -*- coding: utf-8 -*-
from selenium import webdriver
fromselenium.webdriver.common.proxy import *
import time

if __name__ == "__main__":
    my_proxy = '127.0.0.1:8080'

    proxy = Proxy({
```

```
'proxyType': ProxyType.MANUAL,
'httpProxy': my_proxy,
'ftpProxy': my_proxy,
'sslProxy': my_proxy,
'noProxy': ''#set this value as desired
                 })
   driver = webdriver.Firefox(proxy = proxy)

   #for remote
   caps = webdriver.DesiredCapabilities.FIREFOX.copy()
   proxy.add_to_capabilities(caps)
   driver = webdriver.Remote(desired_capabilities = caps)

   driver.maximize_window()
   driver.get('http://192.168.206.8/qcbin:8080')
   time.sleep(10)
   driver.quit()
```

备注：



```
<terminated> D:\workspace\PyCase\src\testtt.py
    _open', req)
  File "D:\Program Files (x86)\Python27\lib\urllib2.py", line
    result = func(*args)
  File "D:\Program Files (x86)\Python27\lib\urllib2.py", line
    return self.do_open(httplib.HTTPConnection, req)
  File "D:\Program Files (x86)\Python27\lib\urllib2.py", line
    raise URLError(err)
urllib2.URLError: <urlopen error [Errno 10061] >
```

上述的运行结果都报错了。。怎么解决？我也不知道。。郁闷。。

➢ 测试设计考虑

● UI Mapping

UI map是一种机制：为了在UI元素的标识或路径改变的时候更容易做出改变，在一个地方为一个测试套件存放所有的定位器。测试脚本然后使用UI map来定位要测试的元素。基本的，UI map是与应用程序的UI元素对应的测试脚本对象的存储胶囊。

test script-->UI map element—>UI element
在脚本和UI元素之间引入一层抽象层

UI map好处：
主要是让测试脚本管理更容易。当需要对某个定位器编辑时，有一个更容易找到哪些对象的中心位置，而不要搜索整个测试脚本代码。同时，它允许仅在一个地方修改定位器，而不需要在多个地方做修改。
总体来说，有两点很大的好处，如下

1．为ui对象使用一个中心化的位置，而不是让它们分散在整个脚本，这让脚本维护更容易维护
2．可以为html标识和名字附上更易读的名字，提高测试脚本的可靠性

有几种方式来实现UI Map，可以创建类或struct结构体，其每个属性(元素)仅存放一个定位器，也可以选择text文件来存储键值对。

● 页面对象设计模式

一个页面对象是一个对象化的类，充当接口自动化测试页面的接口。无论何时，测试都可以页面对象类的方法同那个页面的UI交互。这样做的好处是，如果那个页面的UI改变了，测试本身不需要修改，仅需要修改包含在页面对象类里的代码，结果是，为支持新的UI所做的改变都位于同一个地方

页面对象设计模式有以下优点：
1．测试代码和页面详细代码,如定位器（或他们的使用，如果你正在使用一个UI map),以及代码布局之间界限清楚.
2．页面提供的服务或者操作有一个单一的存储，而不是分散在整个测试中

基本原则：
从不对页面对象本身做验证或者断言，这是测试的一部分并且应该放在测试代码里面，绝不能放在页面对象里，这个页面对象仅包含页面呈现，通过页面方法提供的各种服务，但是没有与“正在测试什么”相关的代码。

仅有一种情况，验证可以并且应该放在页面对象，那就是确认这个页面和页面上的关键元素被正确的加载。这个确认必须在初始化页面对象时进行。即构造函数中写入。如下

```
/**
 * Page Object encapsulates the Sign-in page.
 */
public class SignInPage {

        private Selenium selenium;

        public SignInPage(Selenium selenium) {
                this.selenium = selenium;
                if(!selenium.getTitle().equals("Sign in page")) {
                        throw new IllegalStateException("This is not sign in page, current
                                        +selenium.getLocation());
                }
        }

        /**
         * Login as valid user
         *
         * @param userName
         * @param password
         * @return HomePage object
         */
        public HomePage loginValidUser(String userName, String password) {
                selenium.type("usernamefield", userName);
                selenium.type("passwordfield", password);
                selenium.click("sign-in");
                selenium.waitForPageToLoad("waitPeriod");

                return new HomePage(selenium);
        }
}
```

一个页面对象可以不用代表整个页面，可以用页面对象来于代表页面上的组件。如果一个页面有多个组件，为每个组件创建一个单独的页面对象有利于提高代码的可维护性

具体参考代码：面向对象-编写自动化测试脚本实例

● 数据驱动测试

指用不同的数据来执行相同的测试。这些数据集往往是从其它文件，.csv、.text等或者从某个数据库读取的。

● 数据库验证

把UI界面的数据同数据库中的实际数据进行对比

➢ Selenium-Grid

● 什么是Selenium-Grid?

在不同机器上，不同操作系统，不同浏览器下同时运行多个测试。本质上，Selenium-Grid支持分布式测试的执行。

● 使用

1. 下载Selenium-Server jar

下载Selenium-Server jar格式文件，并在放在某个文件夹下。

2. 开启Hub

使用缺省参数开启一个hub。

```
java -jar selenium-server-standalone-2.38.0.jar -role hub
```

3．开启一个节点(Node)

```
java -jar selenium-server-standalone-2.38.0.jar -role node  -hub
http://localhost:4444/grid/register
```

暂时用不到，所以我暂时不做研究，有兴趣的可以参考以下连接
http://docs.seleniumhq.org/docs/07_selenium_grid.jsp

➢ webdriver原理解析

下载Selenium server jar包，然后可以使用下面的命令来启动Selenium server

```
D:\>java -Dwebdriver.ie.driver="D:\Program Files
(x86)\Python27\IEDriverServer.exe" -jar elenium-server-standalone-2.40.0.jar
```

```
# coding= utf-8 #可加可不加，防止中文乱码
from selenium importwebdriver
from selenium.webdriver.common.desired_capabilities import
DesiredCapabilities

if __name__ == "__main__":
    driver =
webdriver.Remote(desired_capabilities=DesiredCapabilities.INTERNETEXPLORER)
    driver.get("http://www.baidu.com/")

# 输入框输入内容
    driver.find_element_by_id("kw1").send_keys("selenium")
    driver.find_element_by_id("su1").click()

    driver.close()

    driver.quit()
```

webdriver 原理：

1. WebDriver 启动目标浏览器，并绑定到指定端口。该启动的浏览器实例做为 webdriver 的 remote server。
2. Client 端通过 CommandExcuter 发送 HTTPRequest 给 remote server 的侦听端口（通信协议：the webriver wire protocol）
3. Remote server 需要依赖原生的浏览器组件（如：IEDriver.dll,chromedriver.exe），来转化转化浏览器的native 调用。

```
D:\>java -Dwebdriver.ie.driver="D:\Program Files
(x86)\Python27\IEDriverServer.e
xe" -jar selenium-server-standalone-2.40.0.jar
```

```
2014-7-22 22:24:03 org.openqa.grid.selenium.GridLauncher main
信息: Launching a standalone server
22:24:03.670 INFO - Java: Sun Microsystems Inc. 14.0-b16
22:24:03.670 INFO - OS: Windows 7 6.1 x86
22:24:03.686 INFO - v2.40.0, with Core v2.40.0. Built from revision fbe29a9
22:24:03.748 INFO - RemoteWebDriver instances should connect to:
http://127.0.0.1:4444/wd/hub
22:24:03.748 INFO - Version Jetty/5.1.x
22:24:03.748 INFO - Started
HttpContext[/selenium-server/driver,/selenium-server/driver]
22:24:03.748 INFO - Started HttpContext[/selenium-server,/selenium-server]
22:24:03.748 INFO - Started HttpContext[/,/]
22:24:03.764 INFO - Started
org.openqa.jetty.jetty.servlet.ServletHandler@82c01f

22:24:03.764 INFO - Started HttpContext[/wd,/wd]
22:24:03.779 INFO - Started SocketListener on 0.0.0.0:4444
22:24:03.779 INFO - Started org.openqa.jetty.jetty.Server@128e20a
---------------------------------------------------------------------------
创建新session
22:24:10.284 INFO - Executing: [new session: Capabilities [{platform=WINDOWS,
javascriptEnabled=true, browserName=internet explorer, version=}]] at URL:
/session)
22:24:10.284 INFO - Creating a new session for Capabilities [{platform=WINDOWS,
javascriptEnabled=true, browserName=internet explorer, version=}]
Started InternetExplorerDriver server (32-bit)2.40.0.0
Listening on port 39164
22:24:13.046 INFO - I/O exception (java.net.SocketException) caught when
processing request: Software caused connection abort: recv failed
22:24:13.046 INFO - Retrying request
22:24:13.077 INFO - Done: /session
webdriver通过get方式发送请求
22:24:13.092 INFO - Executing: [get: http://www.baidu.com/] at URL:
session/83f0f523-0a52-4259-ad85-9215066fe330/url)
22:24:13.736 INFO - Done: /session/83f0f523-0a52-4259-ad85-9215066fe330/url
查找百度搜索输入框
22:24:13.736 INFO - Executing: [find element: By.id: kw1] at URL: /session/83f0f
523-0a52-4259-ad85-9215066fe330/element)
22:24:13.799 INFO - Done:
/session/83f0f523-0a52-4259-ad85-9215066fe330/element
输入搜索内容selenium
22:24:13.799 INFO - Executing: [send keys: 0 [[InternetExplorerDriver: internet
explorer on WINDOWS (b939fd02-292f-449e-8f67-71c6dd1f4534)] -> id: kw1], [s,
e,l, e, n, i, u, m]] at URL:
```

```
/session/83f0f523-0a52-4259-ad85-9215066fe330/element/0/value)
22:24:14.126 INFO - Done:
/session/83f0f523-0a52-4259-ad85-9215066fe330/element/0/value
```

查找“百度一下”搜索按钮

```
22:24:14.126 INFO - Executing: [find element: By.id: su1] at URL: /session/83f0f
523-0a52-4259-ad85-9215066fe330/element)
22:24:14.189 INFO - Done:
/session/83f0f523-0a52-4259-ad85-9215066fe330/element
```

点击搜索按钮

```
22:24:14.189 INFO - Executing: [click: 1 [[InternetExplorerDriver: internet
explorer on WINDOWS (b939fd02-292f-449e-8f67-71c6dd1f4534)] -> id: su1]] at URL:
/session/83f0f523-0a52-4259-ad85-9215066fe330/element/1/click)
22:24:14.532 INFO - Done:
/session/83f0f523-0a52-4259-ad85-9215066fe330/element/1/click
```

关闭浏览器

```
22:24:14.532 INFO - Executing: [close window] at URL:
/session/83f0f523-0a52-4259-ad85-9215066fe330/window)
22:24:14.594 INFO - Done:
/session/83f0f523-0a52-4259-ad85-9215066fe330/window
```

删除会话

```
22:24:14.594 INFO - Executing: [delete session:
83f0f523-0a52-4259-ad85-9215066fe330] at URL:
/session/83f0f523-0a52-4259-ad85-9215066fe330)
22:24:15.624 INFO - Done: /session/83f0f523-0a52-4259-ad85-9215066fe330
```

- 参考链接：http://docs.seleniumhq.org/docs/