

# XPATH • CSS • DOM • SELENIUM


## Rosetta Stone and Cookbook

Sprinkled with Selenium usage tips, this is both a general-purpose set of recipes for each technology as well as a cross-reference to map from one to another. The validation suite for this reference chart (<http://bit.ly/gTd5oc>) provides example usage for each recipe supported by Selenium (the majority of them).

### General

Whole web page  
xpath=/html  
css=html  
document.documentElement

Whole web page body  
xpath=/html/body  
css=body  
document.body


All text nodes of web page  
//text() 


Element <E> by absolute reference  
xpath=/html/body/.../.../.../E  
css=body>...>...>...>E  
document.body.childNodes[j]...childNodes[j]


Element <E> by relative reference  
//E  
css=E  
document.gEBTN('E')[0]


Second <E> element anywhere on page  
xpath=(//E)[2]  
document.gEBTN('E')[1]





Image element  
//img  
css=img  
document.images[0]

Element <E> with attribute A  
//E[@A]  
css=E[A]  
dom=for each (e in document.gEBTN('E')) if (e.A) e 


Element <E> with attribute A containing text 't' exactly  
//E[@A='t']  
css=E[A='t'] 

Element <E> with attribute A containing text 't'  
//E[contains(@A,'t')]  
css=E[A\*='t'] 

Element <E> whose attribute A begins with 't'  
//E[starts-with(@A,'t')]  
css=E[A^='t'] 

Element <E> whose attribute A ends with 't'  
//E[ends-with(@A,'t')]     
//E[substring(@A, string-length(@A) - string-length('t')+1)='t']  
css=E[A\$='t'] 

Element <E> with attribute A containing word 'w'  
//E[contains(concat(' ', @A, ' '), 'w ')]  
css=E[A~='w ']



Element <E> with attribute A matching regex 'r'  
//E[matches(@A,'r')] 


Element <E1> with id I1 or element <E2> with id I2  
//E1[@id=I1] | //E2[@id=I2]  
css=E1#I1,E2#I2


Element <E1> with id I1 or id I2  
//E1[@id=I1 or @id=I2]  
css=E1#I1,I2#I2


### Tag

### Attribute

Attribute A of element <E>  
//E/@A  [Se: //E@A]  
[Se: css=E@A]  
document.gEBTN('E')[0].getAttribute('A')   
[Se: document.gEBTN('E')[0]@A]

Attribute A of any element  
///\*@A  [Se: ///\*@A]  
[Se: css=\*@A]

Attribute A1 of element <E> where attribute A2 is 't' exactly  
//E[@A2='t']/@A1  [Se: //E[@A2='t']/@A1]  
[Se: css=[A2='t']/@A1]

Attribute A of element <E> where A contains 't'  
//E[contains(@A,'t')]/@A  [Se: //E[contains(@A,'t')]/@A]  
[Se: css=E[A\*='t']/@A]



### Id & Name

Element <E> with id I  
//E[@id='I']  
css=E#I

Element with id I  
//\*[ @id='I']  
css=#I  
document.gEBI('I')  
id=I

Element <E> with name N  
//E[@name='N']  
css=E[name=N]

Element with name N  
//\*[ @name='N']  
css=[name=N]  
document.getElementsByName('N')[0]  
name=N

Element with id X or, failing that, a name X  
//\*[ @id='X' or @name='X']  
X   identifier=X

Element with name N & specified 0-based index 'v'  
//\*[ @name='N'][v+1]  
css=[name=N]:nth-child(v+1)  
name=N index=v

Element with name N & specified value 'v'  
//\*[ @name='N'][@value='v']  
css=[name=N][value='v']  
name=N value=v

### Lang & Class


Element <E> is explicitly in language L or subcode  
//E[@lang='L' or starts-with(@lang,concat('L',''))]  
css=E[lang=L]

Element <E> is in language L or subcode (possibly inherited)  
css=E:lang(L)

Element with a class C  
//\*[contains(concat(' ', @class, ' '), 'C ')]  
css=.C  
document.getElementsByClassName('C')[0]  
Element <E> with a class C  
//E[contains(concat(' ', @class, ' '), 'C ')]  
css=E.C


### Text & Link

Element containing text 't' exactly  
//\*[.='t']

Element <E> containing text 't'  
//E[contains(text(),'t')]  
css=E:contains('t') 

Link element  
//a  
css=a  
document.links[0]


<a> containing text 't' exactly  
//a[.='t']  
link=t


<a> containing text 't'  
//a[contains(text(),'t')]  
css=a:contains('t') 


<a> with target link 'url'  
//a[href='url']  
css=a[href='url']


Link URL labeled with text 't' exactly  
//a[.='t']/@href




### Parent & Child

First child of element <E>  
//E/\*[1]  
css=E > \*:first-child [Se: css=E > \*]  
document.gEBTN('E')[0].firstChild 


First <E> child  
//E[1]  
css=E:first-of-type  [Se: css=E]  
document.gEBTN('E')[0]


Last child of element E  
//E/\*[last()]  
css=E \*:last-child  
document.gEBTN('E')[0].lastChild 

Last <E> child  
//E[last()]  
css=E:last-of-type   
document.gEBTN(E)[document.gEBTN(E).length-1]

Second <E> child  
//E[2]   //E/following-sibling::E  
css=E:nth-of-type(2)   
document.gEBTN('E')[1]

Second child that is an <E> element  
//\*[2](name()='E')  
css=E:nth-child(2)

Second-to-last <E> child  
//E[last()-1]  
css=E:nth-last-of-type(2)   
document.gEBTN(E)[document.gEBTN(E).length-2]

Second-to-last child that is an <E> element  
//\*[last()-1](name()='E')  
css=E:nth-last-child(2) 

Element <E1> with only <E2> children  
//E1[E2 and not( \*[(not(self::E2))])]  
Parent of element <E>  
//E/..  
document.gEBTN('E')[0].parentNode


Descendant <E> of element with id I using specific path  
//\*[ @id='I']/.../.../.../E  
css=#I > ... > ... > ... > E  
document.gEBI('I')...gEBTN('E')[0]

Descendant <E> of element with id I using unspecified path  
//\*[ @id='I']/E  
css=#I E  
document.gEBI('I').gEBTN('E')[0]

Element <E> with no children  
//E[count(\*)=0]  
css=E:empty

Element <E> with an only child  
//E[count(\*)=1]

Element <E> that is an only child  
//E[count(preceding-sibling::\*+count(following-sibling::\*)=0)]  
css=E:only-child

Element <E> with no <E> siblings  
//E[count(../E)=1]  
css=E:only-of-type 

Every Nth element starting with the (M+1)th  
//E[position() mod M = M + 1]  
css=E:nth-child(Nn + M)

### Footnotes

- DOM has limited capability with a simple 'document...' expression; however, arbitrary JavaScript code may be used as shown in this example.
- CSS does not support qualifying elements with the **style** attribute, as in `div[style="border-width"]`.
- Selenium uses a special syntax for returning attributes; normal XPath, CSS, and DOM syntax will fail.
- CSS: The CSS2 **contains** function is **not** in CSS3; however, Selenium supports the superset of CSS1, 2, and 3.
- DOM: **firstChild**, **lastChild**, **nextSibling**, and **previousSibling** are problematic with mixed content; they will point to empty text nodes rather than desired elements depending on whitespace in web page source.

### Sibling

Element <E1> following some sibling <E2>  
//E2/following-sibling::E1  
css=E2 ~ E1

Element <E1> immediately following sibling <E2>  
//E2/following-sibling::\*[1](name()='E1']  
css=E2 + E1


Element <E1> following sibling <E2> with one intermediary  
//E2/following-sibling::\*[2](name()='E1']  
css=E2 + \* + E1

Sibling element immediately following <E>  
//E/following-sibling::\*  
css=E + \*

Element <E1> preceding some sibling <E2>  
//E2/preceding-sibling::E1

Element <E1> immediately preceding sibling <E2>  
//E2/preceding-sibling::\*[1](name()='E1']


Element <E1> preceding sibling <E2> with one intermediary  
//E2/preceding-sibling::\*[2](name()='E1']

Sibling element immediately preceding <E>  
//E/preceding-sibling::\*[1]  
document.gEBTN('E2')[0].previousSibling 

### Table Cell

Cell by row and column (e.g. 3rd row, 2nd column)  
//\*[ @id='TestTable']/tr[3]/td[2]  
[Se: //\*[ @id='TestTable'].2.1]  
css=#TestTable tr:nth-child(3) td:nth-child(2)  
[Se: css=#TestTable.2.1]  
document.gEBI('TestTable').gEBTN('tr')[2].gEBTN('td')[1]  
[Se: document.gEBI('TestTable').2.1]

Cell immediately following cell containing 't' exactly  
//td[preceding-sibling::td='t']

Cell immediately following cell containing 't'  
//td[preceding-sibling::td[contains(.,'t')]]  
css=td:contains('t') ~ td 

### Dynamic


User interface element <E> that is disabled  
//E[@disabled]  
css=E:disabled


User interface element that is enabled  
//\*[not(@disabled)]  
css=\*:enabled


Checkbox (or radio button) that is checked  
//\*[ @checked]  
css=\*:checked

Element being designated by a pointing device  
css=E:hover 

Element has keyboard input focus  
css=E:focus 

Unvisited link  
css=E:link 

Visited link  
css=E:visited 



Active element  
css=E:active 

### General Notes

Indexing (all): XPath and CSS use 1-based indexing; DOM and Selenium's table syntax use 0-based indexing.  
Prefixes (all): `xpath=` required unless expression starts with `//` • `dom=` required unless expression starts with "document." • `css=` always required • `identifier=` never required.  
Cardinality (Selenium): XPath and CSS may specify a node set or a single node; DOM must specify a single node. When a node set is specified, Selenium returns just the first node.  
Content (XPath): Generally should use `normalize-space()` when operating on display text.

Key  XPath  CSS  DOM  Selenium  
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DOM abbreviations:  
gEBI getElementById  
gEBTN getElementsByTagName

[Se: ...]	Selenium-only variation
	Not supported by Selenium
	Space character
expression	CSS3 or XPath 2.0