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[i]...childNodes[j]

Tag

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 ❶

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

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

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

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

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

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,E1#I2

Attribute ❸

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=E[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 ◄OR► 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') ❹

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') ❹

<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 ❺

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

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

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

Second <E> child
//E[2] ◄OR► //E/following-sibling::E
css=E:nth-of-type(2) ⌧
document.getEBTN('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 N = M + 1]
css=E:nth-child(Nn + M)

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 + *
document.gEBTN('E')[0].nextSibling ❺

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 ❺

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 ❹

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 ⌧

Footnotes

❶ DOM has limited capability with a simple 'document...' expression; however, arbitrary JavaScript code may be used as shown in this example.
❷ CSS does not support qualifying elements with the **style** attribute, as in div[style*='border-width'].
❸ Selenium uses a special syntax for returning attributes; normal XPath, CSS, and DOM syntax will fail.
❹ CSS: The CSS2 **contains** function is ***not in CSS3***; however, Selenium supports the superset of CSS1, 2, and 3.
❺ 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.

{Se: . . . }	Selenium-only variation
⌧	Not supported by Selenium
◉	Space character
expression	CSS3 or XPath 2.0

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

DOM abbreviations:
gEBI getElementById
gEBTN getElementsByTagName

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