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XPath Operators

An XPath expression returns either a node-set, a string, a Boolean, or a number.

XPath Operators

Below is a list of the operators that can be used in XPath expressions:

Operator	Description	Example	Return value
|	Computes two node-sets	//book | //cd	Returns a node-set with all book and cd elements
+	Addition	6 + 4	10
-	Subtraction	6 - 4	2
*	Multiplication	6 * 4	24
div	Division	8 div 4	2
=	Equal	price=9.80	true if price is 9.80 false if price is 9.90
!=	Not equal	price!=9.80	true if price is 9.90 false if price is 9.80
<	Less than	price<9.80	true if price is 9.00 false if price is 9.80
<=	Less than or equal to	price<=9.80	true if price is 9.00 false if price is 9.90
>	Greater than	price>9.80	true if price is 9.90 false if price is 9.80
>=	Greater than or equal to	price>=9.80	true if price is 9.90 false if price is 9.70
or	or	price=9.80 or price=9.70	true if price is 9.80 false if price is 9.50
and	and	price>9.00 and price<9.90	true if price is 9.80 false if price is 8.50
mod	Modulus (division remainder)	5 mod 2	1

XPath, XQuery, and XSLT Functions

The following reference library defines the functions required for XPath 2.0, XQuery 1.0 and XSLT 2.0.

Functions Reference

- Accessor
- Error and Trace
- Numeric
- String
- AnyURI
- Boolean
- Duration/Date/Time
- QName
- Node
- Sequence
- Context

The default prefix for the function namespace is fn:

The URI of the function namespace is: http://www.w3.org/2005/xpath-functions

Accessor Functions

Name	Description
fn:node-name(*node*)	Returns the node-name of the argument node
fn:nilled(*node*)	Returns a Boolean value indicating whether the argument node is nilled
fn:data(*item.item,...*)	Takes a sequence of items and returns a sequence of atomic values

fn:base-uri()
fn:base-uri(*node*)
	Returns the value of the base-uri property of the current or specified node

fn:document-uri(*node*)	Returns the value of the document-uri property for the specified node

Error and Trace Functions

Name	Description

fn:error()
fn:error(*error*)
fn:error(*error,description*)
fn:error(*error,description,error-object*)
	Example: error(fn:QName('http://example.com/test', 'err:toohigh'), 'Error: Price is too high')
	Result: Returns http://example.com/test#toohigh and the string "Error: Price is too high" to the external processing environment

fn:trace(*value,label*)	Used to debug queries

Functions on Numeric Values

Name	Description
fn:number(*arg*)	Returns the numeric value of the argument. The argument could be a boolean, string, or node-set Example: number('100') Result: 100
fn:abs(*num*)	Returns the absolute value of the argument Example: abs(3.14) Result: 3.14 Example: abs(-3.14) Result: 3.14
fn:ceiling(*num*)	Returns the smallest integer that is greater than the number argument Example: ceiling(3.14) Result: 4
fn:floor(*num*)	Returns the largest integer that is not greater than the number argument Example: floor(3.14) Result: 3
fn:round(*num*)	Rounds the number argument to the nearest integer Example: round(3.14) Result: 3

fn:round-half-to-even()	Example: round-half-to-even(0.5) Result: 0 Example: round-half-to-even(1.5) Result: 2 Example: round-half-to-even(2.5) Result: 2

Functions on Strings

Name	**Description**
fn:string(*arg*)	Returns the string value of the argument. The argument could be a number, boolean, or node-set Example: string(314) Result: "314"
fn:codepoints-to-string(*int,int,...*)	Returns a string from a sequence of code points Example: codepoints-to-string(84, 104, 233, 114, 232, 115, 101) Result: 'Thérèse'
fn:string-to-codepoints(*string*)	Returns a sequence of code points from a string Example: string-to-codepoints("Thérèse") Result: 84, 104, 233, 114, 232, 115, 101
fn:codepoint-equal(*comp1,comp2*)	Returns true if the value of comp1 is equal to the value of comp2, according to the Unicode code point collation (http://www.w3.org/2005/02/xpath-functions/collation/codepoint), otherwise it returns false

fn:compare(*comp1,comp2*)
fn:compare(*comp1,comp2,collation*)
	Returns -1 if comp1 is less than comp2, 0 if comp1 is equal to comp2, or 1 if comp1 is greater than comp2 (according to the rules of the collation that is used)
	Example: compare('ghi', 'ghi')
	Result: 0

fn:concat(*string,string,...*)	Returns the concatenation of the strings Example: concat('XPath ','is ','FUN!') Result: 'XPath is FUN!'
fn:string-join(*(string,string,...),sep*)	Returns a string created by concatenating the string arguments and using the sep argument as the separator Example: string-join(('We', 'are', 'having', 'fun!'), ' ') Result: ' We are having fun! ' Example: string-join(('We', 'are', 'having', 'fun!')) Result: 'Wearehavingfun!' Example:string-join((), 'sep') Result: ''

fn:substring(*string,start,len*)
fn:substring(*string,start*)
	Returns the substring from the start position to the specified length. Index of the first character is 1. If length is omitted it returns the substring from the start position to the end
	Example: substring('Beatles',1,4)

	Result: 'Beat' Example: substring('Beatles',2) Result: 'eatles'

fn:string-length(*string*)
fn:string-length()
	Returns the length of the specified string. If there is no string argument it returns the length of the string value of the current node
	Example: string-length('Beatles')
	Result: 7

fn:normalize-space(*string*)
fn:normalize-space()
	Removes leading and trailing spaces from the specified string, and replaces all internal sequences of white space with one and returns the result. If there is no string argument it does the same on the current node
	Example: normalize-space(' The XML ')
	Result: 'The XML'

fn:normalize-unicode()	
fn:upper-case(*string*)	Converts the string argument to upper-case Example: upper-case('The XML') Result: 'THE XML'
fn:lower-case(*string*)	Converts the string argument to lower-case Example: lower-case('The XML') Result: 'the xml'
fn:translate(*string1,string2,string3*)	Converts string1 by replacing the characters in string2 with the characters in string3 Example: translate('12:30','30','45') Result: '12:45' Example: translate('12:30','03','54') Result: '12:45' Example: translate('12:30','0123','abcd') Result: 'bc:da'
fn:escape-uri(*stringURI,esc-res*)	Example: escape-uri("http://example.com/test#car", true()) Result: "http%3A%2F%2Fexample.com%2Ftest#car" Example: escape-uri("http://example.com/test#car", false()) Result: "http://example.com/test#car" Example: escape-uri ("http://example.com/~bébé", false()) Result: "http://example.com/~b%C3%A9b%C3%A9"
fn:contains(*string1,string2*)	Returns true if string1 contains string2, otherwise it returns false Example: contains('XML','XM') Result: true
fn:starts-with(*string1,string2*)	Returns true if string1 starts with string2, otherwise it returns false Example: starts-with('XML','X') Result: true
fn:ends-with(*string1,string2*)	Returns true if string1 ends with string2, otherwise it

	returns false Example: ends-with('XML','X') Result: false
fn:substring-before(*string1,string2*)	Returns the start of string1 before string2 occurs in it Example: substring-before('12/10','/') Result: '12'
fn:substring-after(*string1,string2*)	Returns the remainder of string1 after string2 occurs in it Example: substring-after('12/10','/') Result: '10'
fn:matches(*string,pattern*)	Returns true if the string argument matches the pattern, otherwise, it returns false Example: matches("Merano", "ran") Result: true
fn:replace(*string,pattern,replace*)	Returns a string that is created by replacing the given pattern with the replace argument Example: replace("Bella Italia", "l", "*") Result: 'Be**a Ita*ia' Example: replace("Bella Italia", "l", "") Result: 'Bea Itaia'
fn:tokenize(*string,pattern*)	Example: tokenize("XPath is fun", "\s+") Result: ("XPath", "is", "fun")

Functions for anyURI

Name	**Description**
fn:resolve-uri(*relative,base*)	

Functions on Boolean Values

Name	**Description**
fn:boolean(*arg*)	Returns a boolean value for a number, string, or node-set
fn:not(*arg*)	The argument is first reduced to a boolean value by applying the boolean() function. Returns true if the boolean value is false, and false if the boolean value is true Example: not(true()) Result: false
fn:true()	Returns the boolean value true Example: true() Result: true
fn:false()	Returns the boolean value false Example: false() Result: false

Functions on Durations, Dates and Times

Component Extraction Functions on Durations, Dates and Times

Name	**Description**
fn:dateTime(*date,time*)	Converts the arguments to a date and a time
fn:years-from-duration(*datetimedur*)	Returns an integer that represents the years component in the canonical lexical representation of the value of the argument
fn:months-from-duration(*datetimedur*)	Returns an integer that represents the months component in the canonical lexical representation of the value of the argument
fn:days-from-duration(*datetimedur*)	Returns an integer that represents the days component in the canonical lexical representation of the value of the argument
fn:hours-from-duration(*datetimedur*)	Returns an integer that represents the hours component in the canonical lexical representation of the value of the argument
fn:minutes-from-duration(*datetimedur*)	Returns an integer that represents the minutes component in the canonical lexical representation of the value of the argument
fn:seconds-from-duration(*datetimedur*)	Returns a decimal that represents the seconds component in the canonical lexical representation of the value of the argument
fn:year-from-dateTime(*datetime*)	Returns an integer that represents the year component in the localized value of the argument Example: year-from-dateTime(xs:dateTime("2005-01-10T12:30-04:10")) Result: 2005
fn:month-from-dateTime(*datetime*)	Returns an integer that represents the month component in the localized value of the argument Example: month-from-dateTime(xs:dateTime("2005-01-10T12:30-04:10")) Result: 01
fn:day-from-dateTime(*datetime*)	Returns an integer that represents the day component in the localized value of the argument Example: day-from-dateTime(xs:dateTime("2005-01-10T12:30-04:10")) Result: 10
fn:hours-from-dateTime(*datetime*)	Returns an integer that represents the hours component in the localized value of the argument Example: hours-from-dateTime(xs:dateTime("2005-01-10T12:30-04:10")) Result: 12
fn:minutes-from-dateTime(*datetime*)	Returns an integer that represents the minutes component in the localized value of the argument Example: minutes-from-dateTime(xs:dateTime("2005-01-10T12:30-04:10")) Result: 30

fn:seconds-from-dateTime(*datetime*)	Returns a decimal that represents the seconds component in the localized value of the argument Example: seconds-from-dateTime(xs:dateTime("2005-01-10T12:30:00-04:10")) Result: 0
fn:timezone-from-dateTime(*datetime*)	Returns the time zone component of the argument if any
fn:year-from-date(*date*)	Returns an integer that represents the year in the localized value of the argument Example: year-from-date(xs:date("2005-04-23")) Result: 2005
fn:month-from-date(*date*)	Returns an integer that represents the month in the localized value of the argument Example: month-from-date(xs:date("2005-04-23")) Result: 4
fn:day-from-date(*date*)	Returns an integer that represents the day in the localized value of the argument Example: day-from-date(xs:date("2005-04-23")) Result: 23
fn:timezone-from-date(*date*)	Returns the time zone component of the argument if any
fn:hours-from-time(*time*)	Returns an integer that represents the hours component in the localized value of the argument Example: hours-from-time(xs:time("10:22:00")) Result: 10
fn:minutes-from-time(*time*)	Returns an integer that represents the minutes component in the localized value of the argument Example: minutes-from-time(xs:time("10:22:00")) Result: 22
fn:seconds-from-time(*time*)	Returns an integer that represents the seconds component in the localized value of the argument Example: seconds-from-time(xs:time("10:22:00")) Result: 0
fn:timezone-from-time(*time*)	Returns the time zone component of the argument if any
fn:adjust-dateTime-to-timezone(*datetime,timezone*)	If the timezone argument is empty, it returns a dateTime without a timezone. Otherwise, it returns a dateTime with a timezone
fn:adjust-date-to-timezone(*date,timezone*)	If the timezone argument is empty, it returns a date without a timezone. Otherwise, it returns a date with a timezone
fn:adjust-time-to-timezone(*time,timezone*)	If the timezone argument is empty, it returns a time without a timezone. Otherwise, it returns a time with a timezone

Functions Related to QNames

Name	Description
fn:QName()	
fn:local-name-from-QName()	
fn:namespace-uri-from-QName()	
fn:namespace-uri-for-prefix()	
fn:in-scope-prefixes()	
fn:resolve-QName()	

Functions on Nodes

Name	Description

fn:name()
fn:name(*nodeset*)
	Returns the name of the current node or the first node in the specified node set

fn:local-name()
fn:local-name(*nodeset*)
	Returns the name of the current node or the first node in the specified node set - without the namespace prefix

fn:namespace-uri()
fn:namespace-uri(*nodeset*)
	Returns the namespace URI of the current node or the first node in the specified node set

fn:lang(*lang*)	Returns true if the language of the current node matches the language of the specified language Example: Lang("en") is true for <p xml:lang="en">...</p> Example: Lang("de") is false for <p xml:lang="en">...</p>

fn:root()
fn:root(*node*)
	Returns the root of the tree to which the current node or the specified belongs. This will usually be a document node

Functions on Sequences

General Functions on Sequences

Name	Description
fn:index-of(*(item,item,...),searchitem*)	Returns the positions within the sequence of items that are equal to the searchitem argument Example: index-of ((15, 40, 25, 40, 10), 40) Result: (2, 4) Example: index-of (("a", "dog", "and", "a", "duck"), "a") Result (1, 4) Example: index-of ((15, 40, 25, 40, 10), 18) Result: ()
fn:remove(*(item,item,...),position*)	Returns a new sequence constructed from the value of the item arguments - with the item specified by the position argument removed Example: remove(("ab", "cd", "ef"), 0) Result: ("ab", "cd", "ef")

	Example: remove(("ab", "cd", "ef"), 1) Result: ("cd", "ef") Example: remove(("ab", "cd", "ef"), 4) Result: ("ab", "cd", "ef")
fn:empty(*item,item,...*)	Returns true if the value of the arguments IS an empty sequence, otherwise it returns false Example: empty(remove(("ab", "cd"), 1)) Result: false
fn:exists(*item,item,...*)	Returns true if the value of the arguments IS NOT an empty sequence, otherwise it returns false Example: exists(remove(("ab"), 1)) Result: false
fn:distinct-values(*(item,item,...),collation*)	Returns only distinct (different) values Example: distinct-values((1, 2, 3, 1, 2)) Result: (1, 2, 3)
fn:insert-before(*(item,item,...),pos,inserts*)	Returns a new sequence constructed from the value of the item arguments - with the value of the inserts argument inserted in the position specified by the pos argument Example: insert-before(("ab", "cd"), 0, "gh") Result: ("gh", "ab", "cd") Example: insert-before(("ab", "cd"), 1, "gh") Result: ("gh", "ab", "cd") Example: insert-before(("ab", "cd"), 2, "gh") Result: ("ab", "gh", "cd") Example: insert-before(("ab", "cd"), 5, "gh") Result: ("ab", "cd", "gh")
fn:reverse(*(item,item,...)*)	Returns the reversed order of the items specified Example: reverse(("ab", "cd", "ef")) Result: ("ef", "cd", "ab") Example: reverse(("ab")) Result: ("ab")
fn:subsequence(*(item,item,...),start,len*)	Returns a sequence of items from the position specified by the start argument and continuing for the number of items specified by the len argument. The first item is located at position 1 Example: subsequence(($item1, $item2, $item3,...), 3) Result: ($item3, ...) Example: subsequence(($item1, $item2, $item3, ...), 2, 2) Result: ($item2, $item3)
fn:unordered(*(item,item,...)*)	Returns the items in an implementation dependent order

Functions That Test the Cardinality of Sequences

Name	**Description**
fn:zero-or-one(*item,item,...*)	Returns the argument if it contains zero or one items, otherwise it raises an error
fn:one-or-more(*item,item,...*)	Returns the argument if it contains one or more items, otherwise it raises an error
fn:exactly-one(*item,item,...*)	Returns the argument if it contains exactly one item, otherwise it raises an error

Equals, Union, Intersection and Except

Name	**Description**
fn:deep-equal(*param1,param2,collation*)	Returns true if param1 and param2 are deep-equal to each other, otherwise it returns false

Aggregate Functions

Name	**Description**
fn:count(*(item,item,...)*)	Returns the count of nodes
fn:avg(*(arg,arg,...)*)	Returns the average of the argument values Example: avg((1,2,3)) Result: 2
fn:max(*(arg,arg,...)*)	Returns the argument that is greater than the others Example: max((1,2,3)) Result: 3 Example: max(('a', 'k')) Result: 'k'
fn:min(*(arg,arg,...)*)	Returns the argument that is less than the others Example: min((1,2,3)) Result: 1 Example: min(('a', 'k')) Result: 'a'
fn:sum(*arg,arg,...*)	Returns the sum of the numeric value of each node in the specified node-set

Functions that Generate Sequences

Name	**Description**
fn:id(*(string,string,...),node*)	Returns a sequence of element nodes that have an ID value equal to the value of one or more of the values specified in the string argument
fn:idref(*(string,string,...),node*)	Returns a sequence of element or attribute nodes that have an IDREF value equal to the value of one or more of the values specified in the string argument
fn:doc(*URI*)	

fn:doc-available(*URI*)	Returns true if the doc() function returns a document node, otherwise it returns false

fn:collection()
fn:collection(*string*)	

Context Functions

Name	**Description**
fn:position()	Returns the index position of the node that is currently being processed Example: //book[position()<=3] Result: Selects the first three book elements
fn:last()	Returns the number of items in the processed node list Example: //book[last()] Result: Selects the last book element
fn:current-dateTime()	Returns the current dateTime (with timezone)
fn:current-date()	Returns the current date (with timezone)
fn:current-time()	Returns the current time (with timezone)
fn:implicit-timezone()	Returns the value of the implicit timezone
fn:default-collation()	Returns the value of the default collation
fn:static-base-uri()	Returns the value of the base-uri