

جامعة حماه

الكلية التطبيقية – قسم تقنيات الحاسوب

السنة الثالثة - مادة برمجة الويب ٢

## المحاضرة الثالثة

# XPATH

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## ماهى XPath:

**XPath**: هي اختصار لـ **Xml Path Language**

وهي تستخدم للتنقل بين العقد الموجودة في ملف xml.

إنّ **XPath** :

١. تستخدم تعبيرات مسارية للتنقل في مستندات **XML** .
٢. تتضمن الكثير من الدوال القياسية (Built-in Functions) منها للتعامل مع البيانات النصية، ومنها للبيانات الرقمية وغيرها الكثير.
٣. تستخدم في العديد من اللغات مثل: Java, Java Script, PHP, C++,.....
٤. عنصر رئيسي في XSLT.
٥. موصى بها من قبل W3C.

## العلاقات بين العقد فى XPath:

• **Parent**:

مثال:

```
<?xml version="1.0" encoding="UTF-8"?>

<bookstore>
  <book>
    <title lang="en">Harry Potter</title>
    <author>J K. Rowling</author>
    <year>2005</year>
    <price>29.99</price>
  </book>
</bookstore>
```

العقدة book في هذا المثال هي الأب ( Parent ) لكل من title, author, year, price

### • **:Children**

في المثال السابق العقد title, author, year, price هم أبناء ( Children ) للعقدة الأب book.

### • **:Siblings**

في المثال السابق العقد title, author, year, price هم أشقاء ( Siblings ) .

### • **:Ancestors**

في المثال السابق أجداد ( Ancestors ) العقدة title هم العقد book, bookstore.

### • **:Descendants**

في المثال السابق أحفاد ( Descendants ) العقدة bookstore هم العقد book, title, author, year, price.

مثال:

<pre> &lt;library&gt;   &lt;book&gt;      &lt;chapter&gt;     &lt;/chapter&gt;      &lt;chapter&gt;       &lt;section&gt;         &lt;paragraph/&gt;         &lt;paragraph/&gt;       &lt;/section&gt;     &lt;/chapter&gt;    &lt;/book&gt; &lt;/library&gt; </pre>	<ul style="list-style-type: none"> <li>library is the parent of book; book is the parent of the two chapters</li> <li>The two chapters are the children of book, and the section is the child of the second chapter</li> <li>The two chapters of the book are siblings (they have the same parent)</li> <li>library, book, and the second chapter are the ancestors of the section</li> <li>The two chapters, the section, and the two paragraphs are the descendants of the book</li> </ul>
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## الوصول إلى العقد في XPath:

تستخدم **XPath** بعض التعابير الخاصة للوصول إلى العقد المطلوبة في ملف XML، منها:

Expression	Description
<i>nodename</i>	Selects all nodes with the name " <i>nodename</i> "
/	Selects from the root node
//	Selects nodes in the document from the current node that match the selection no matter where they are
.	Selects the current node
..	Selects the parent of the current node
@	Selects attributes

- إنَّ المسار الذي يبدأ بـ ( / ) هو مسار مطلق absolute Path ، يبدأ من أعلى الملف، ويمثل فعلياً كامل الملف.
- إنَّ المسار الذي يبدأ بـ ( // ) يمكن أن يبدأ من أي مكان ضمن الملف.

أمثلة:

Path Expression	Result
bookstore	Selects all nodes with the name "bookstore"
/bookstore	Selects the root element bookstore  <b>Note:</b> If the path starts with a slash ( / ) it always represents an absolute path to an element!
bookstore/book	Selects all book elements that are children of bookstore
//book	Selects all book elements no matter where they are in the document
bookstore//book	Selects all book elements that are descendant of the bookstore element, no matter where they are under the bookstore element
//@lang	Selects all attributes that are named lang

## Predicates

- نستخدمها للوصول إلى عقدة معينة أو عقدة تحتوي على قيمة معينة
- يتم تضمينها دوماً ضمن قوسين مربعين [ ].

### أمثلة:

Path Expression	Result
/bookstore/book[1]	Selects the first book element that is the child of the bookstore element.  <b>Note:</b> In IE 5,6,7,8,9 first node is[0], but according to W3C, it is [1]. To solve this problem in IE, set the SelectionLanguage to XPath:  <i>In JavaScript: xml.setProperty("SelectionLanguage","XPath");</i>
/bookstore/book[last()]	Selects the last book element that is the child of the bookstore element
/bookstore/book[last()-1]	Selects the last but one book element that is the child of the bookstore element
/bookstore/book[position()<3]	Selects the first two book elements that are children of the bookstore element
//title[@lang]	Selects all the title elements that have an attribute named lang
//title[@lang='en']	Selects all the title elements that have a "lang" attribute with a value of "en"
/bookstore/book[price>35.00]	Selects all the book elements of the bookstore element that have a price element with a value greater than 35.00
/bookstore/book[price>35.00]/title	Selects all the title elements of the book elements of the bookstore element that have a price element with a value greater than 35.00

الوصول إلى عقد غير محددة :

Wildcard	Description
*	Matches any element node
@*	Matches any attribute node
node()	Matches any node of any kind

أمثلة:

Path Expression	Result
/bookstore/*	Selects all the child element nodes of the bookstore element
//*	Selects all elements in the document
//title[@*]	Selects all title elements which have at least one attribute of any kind

ملاحظة:

- نستخدم العامل | لتحديد عدة مسارات.

Path Expression	Result
//book/title   //book/price	Selects all the title AND price elements of all book elements
//title   //price	Selects all the title AND price elements in the document
/bookstore/book/title   //price	Selects all the title elements of the book element of the bookstore element AND all the price elements in the document

**Axes:**

نستخدم المحاور في XPath لتحديد مجموعة عقد بالنسبة للعقدة الحالية.

لها الشكل العام:

( أي حدد العقدة Y من المحور X )  $X :: Y$

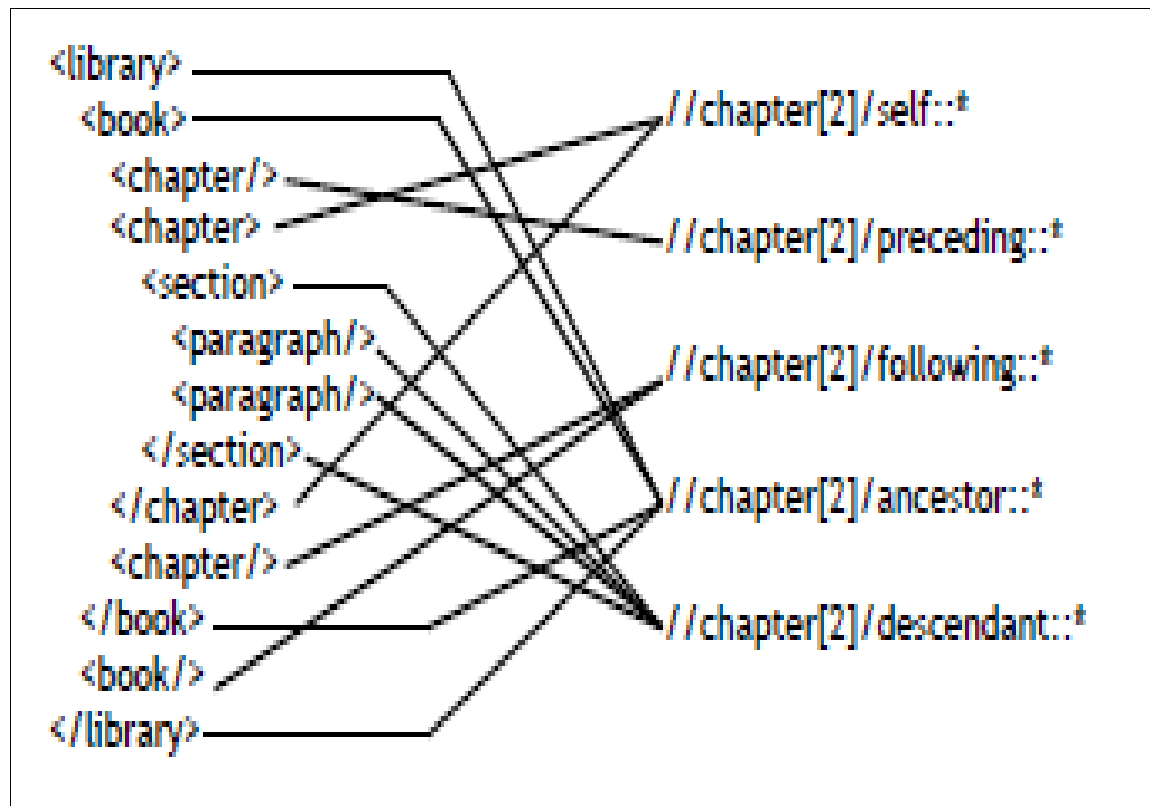
AxisName	Result
ancestor	Selects all ancestors (parent, grandparent, etc.) of the current node
ancestor-or-self	Selects all ancestors (parent, grandparent, etc.) of the current node and the current node itself
attribute	Selects all attributes of the current node
child	Selects all children of the current node
descendant	Selects all descendants (children, grandchildren, etc.) of the current node
descendant-or-self	Selects all descendants (children, grandchildren, etc.) of the current node and the current node itself
following	Selects everything in the document after the closing tag of the current node
following-sibling	Selects all siblings after the current node
namespace	Selects all namespace nodes of the current node
parent	Selects the parent of the current node
preceding	Selects all nodes that appear before the current node in the document, except ancestors, attribute nodes and namespace nodes
preceding-sibling	Selects all siblings before the current node
self	Selects the current node



أمثلة:

Example	Result
child::book	Selects all book nodes that are children of the current node
attribute::lang	Selects the lang attribute of the current node
child::*	Selects all element children of the current node
attribute::*	Selects all attributes of the current node
child::text()	Selects all text node children of the current node
child::node()	Selects all children of the current node
descendant::book	Selects all book descendants of the current node
ancestor::book	Selects all book ancestors of the current node
ancestor-or-self::book	Selects all book ancestors of the current node - and the current as well if it is a book node
child::* / child::price	Selects all price grandchildren of the current node

### مثال:



**:Abbrevitions for Axes**

<i>(none)</i>	is the same as	<code>child::</code>
<code>@</code>	is the same as	<code>attribute::</code>
<code>.</code>	is the same as	<code>self::node()</code>
<code>./X</code>	is the same as	<code>self::node()/descendant-or-self::node()/child::X</code>
<code>..</code>	is the same as	<code>parent::node()</code>
<code>../X</code>	is the same as	<code>parent::node()/child::X</code>
<code>//</code>	is the same as	<code>/descendant-or-self::node()/</code>
<code>//X</code>	is the same as	<code>/descendant-or-self::node()/child::X</code>

**XPath Operators**

Operator	Description	Example
	Computes two node-sets	//book   //cd
+	Addition	6 + 4
-	Subtraction	6 - 4
*	Multiplication	6 * 4
div	Division	8 div 4
=	Equal	price=9.80
!=	Not equal	price!=9.80
<	Less than	price<9.80
<=	Less than or equal to	price<=9.80
>	Greater than	price>9.80
>=	Greater than or equal to	price>=9.80
or	or	price=9.80 or price=9.70
and	and	price>9.00 and price<9.90
mod	Modulus (division remainder)	5 mod 2