# XQuery Notes

## XQuery

-Used to retrieve information from XML documents
-XQuery is a language for finding and extracting elements and attributes from XML documents.
-Used in conjunction with Xpath

## For-Let-Where-OrderBy-Return (FLWR)

- For / Let: Used for gathering nodes into sets from a series of queries.
- Where: For filtering nodes into the sets using conditions.
- Order By: For returning your sets in a particular order
- Return: How to return the identified nodes in the set.

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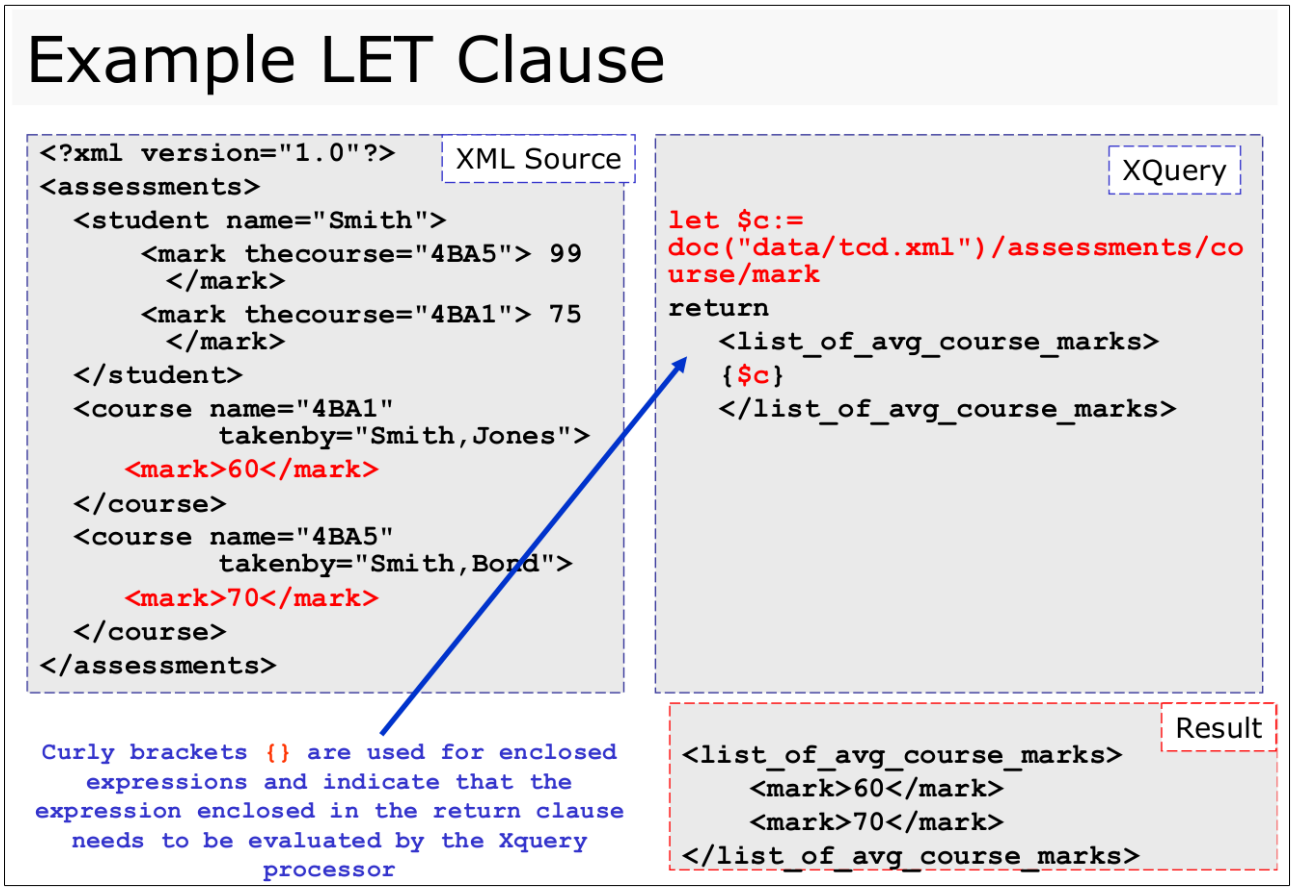
## LET

- LET <variable> := <xpath expression>, <xpath xpression>

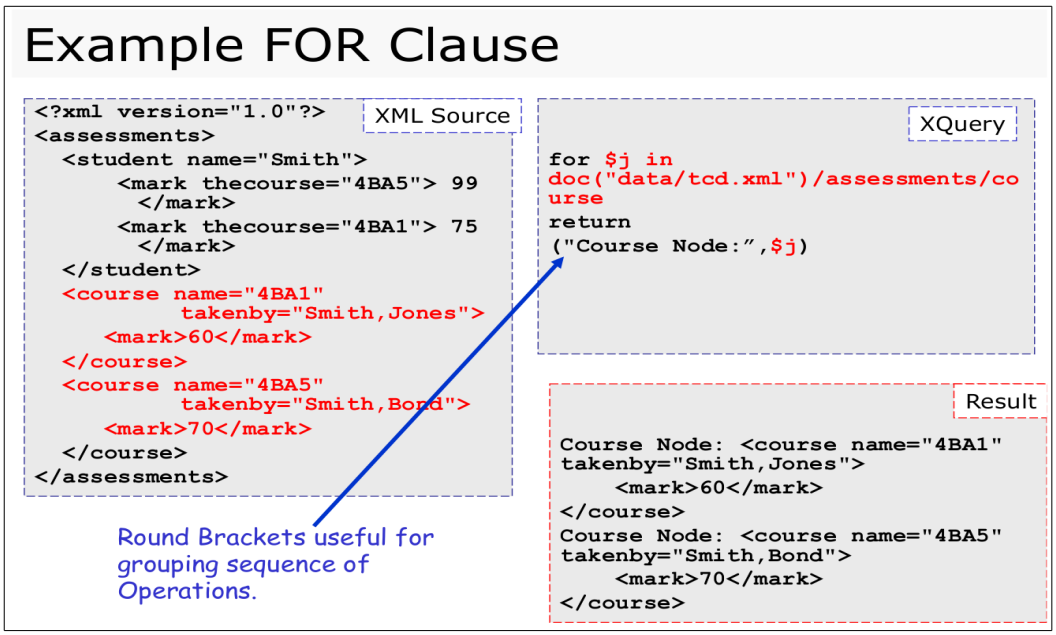
e.g **let $c:= doc("data/tcd.xml")/assessments/course/mark**



## FOR

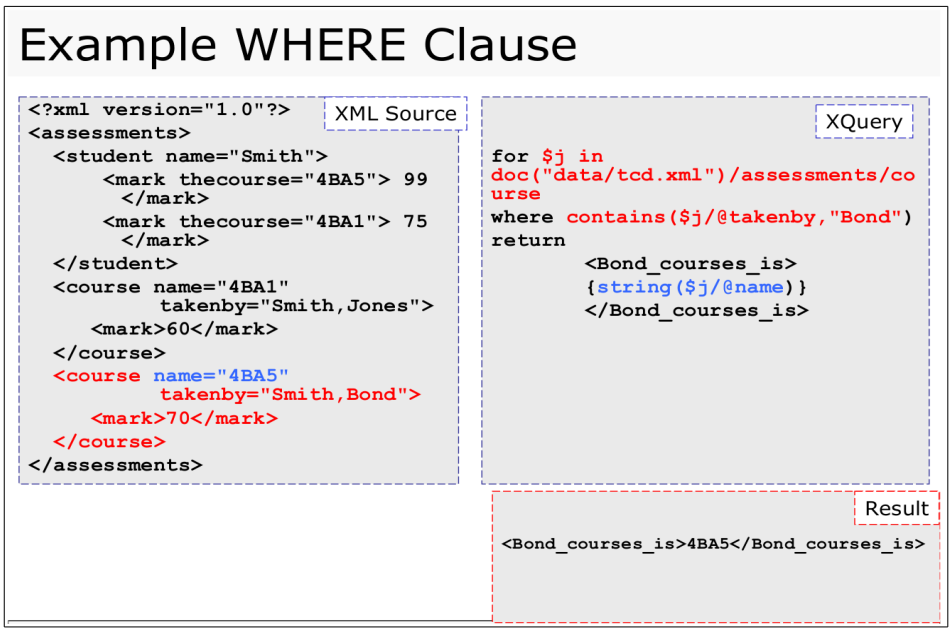
- FOR <variable> IN <xpath expression>, <xpath expression>, <xpath expression>

e.g **for $j in doc("data/tcd.xml")/assessments/course**
**return**
**("Course Node:",$j)**



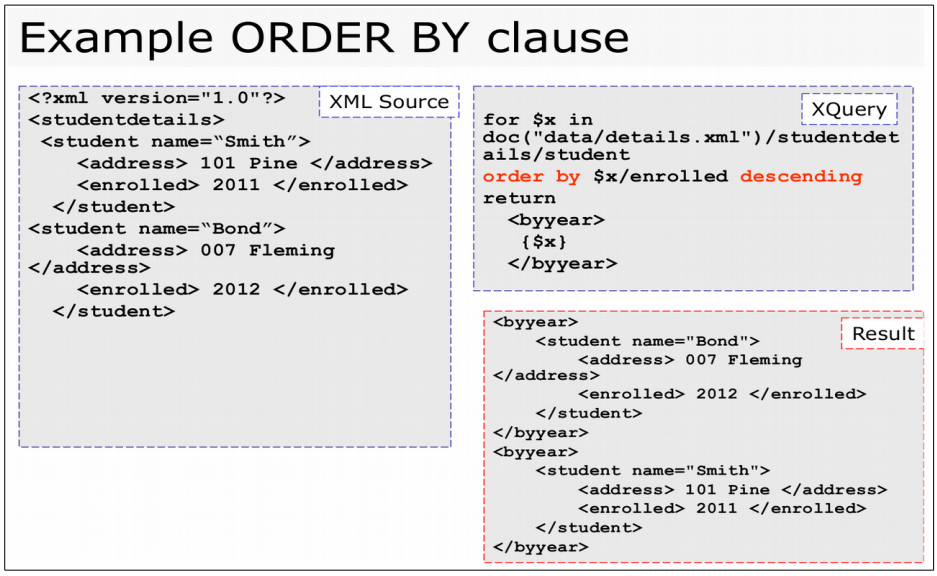

## WHERE

- where contains($j/@takenby,"Bond")



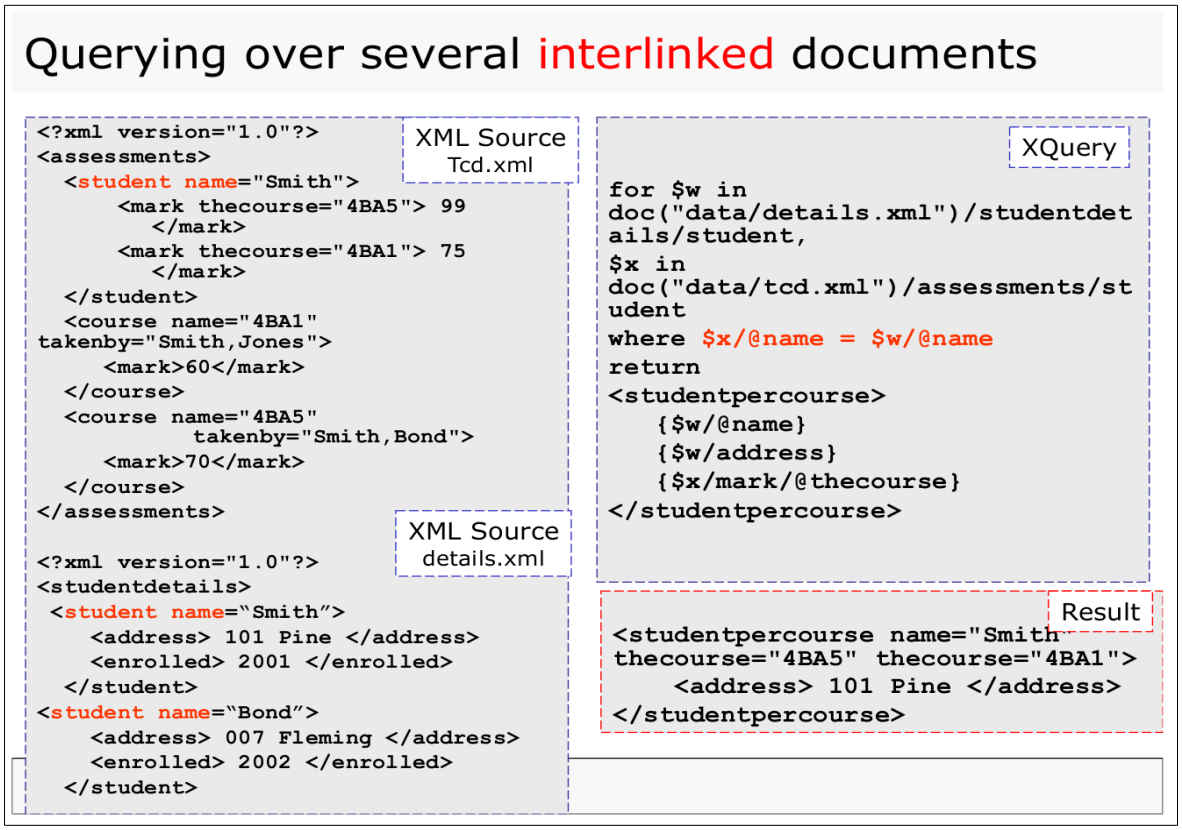
## ORDER BY

- **order by $x/enrolled descending**




## QUERYING OVER SEVERAL DOCUMENTS

-Can simultaneously access multiple documents



## CONDITIONAL STATEMENTS

-Can use conditional statements within your queries

### Example Conditional clause

XML Source

```
<?xml version="1.0"?>
<studentdetails>
 <student name="Smith">
    <address> 101 Pine </address>
    <enrolled> 2012</enrolled>
  </student>
<student name="Bond">
    <address> 007 Fleming
</address>
    <enrolled> 2011 </enrolled>
  </student>
```

XQuery

```
for $x in
doc("data/details.xml")/studentdet
ails/student
return
 <status>
{$x/@name}
{if ($x/enrolled = 2012)
then "new student"
else if ($x/enrolled < 2008)
        then "should be finished"
else "student"}
</status>
```

Result

```
<status name="Smith">
student</status>
 <status name="Bond">
new student</status>
```

## QUANTIFIED EXPRESSIONS

### Example Quantified Expression clauses

XML Source
tcd2.xml

```
<?xml version="1.0"?>
<assessments>
  <student name="Ledwidge">
      <mark thecourse="4BA5"> 45
</mark>
      <mark thecourse="4BA1"> 55
</mark>
  </student>
  <student name="ONeill">
      <mark thecourse="4BA5"> 85
</mark>  </student> </assessments>
```

XQuery

```
<results>
{if (every $m in
doc("data/tcd2.xml")/assessments/s
tudent satisfies $m/mark > 60)
then "excellent results"
else if (some $t in
doc("data/tcd2.xml")/assessments/s
tudent satisfies $t/mark > 50)
then "average results"
else "bad results"
}
</results>
```

Result

```
<results>average results</results>
```

**FUNCTIONS**

## Example Function clause

XML Source
Tcd.xml

```
<?xml version="1.0"?>
<assessments>
  <student name="Smith">
      <mark thecourse="4BA5"> 99
        </mark>
      <mark thecourse="4BA1"> 75
        </mark>
  </student>
  <course name="4BA1"
takenby="Smith,Jones">
     <mark>60</mark>
  </course>
  <course name="4BA5"
           takenby="Smith,Bond">
     <mark>70</mark>
  </course>
</assessments>
```

XML Source
tcd2002.xml

```
<?xml version="1.0"?>
<assessments>
  <student name="Ledwidge">
      <mark thecourse="4BA5"> 45
</mark>
      <mark thecourse="4BA1"> 55
</mark>
  </student>
  <student name="ONeill">
      <mark thecourse="4BA5"> 85
</mark>  </student> </assessments>
```

XQuery

```
declare function local:all_students()
   {
for $s in
doc("data/tcd.xml")/assessments/student
union
doc("data/tcd2.xml")/assessments/studen
t
return
<student>
         {$s/@name}
         {$s/mark/@thecourse}
</student>
   };

<all>
{local:all_students()}
</all>
```

Result

```
<all>
    <student name="Smith" thecourse="4BA5"
thecourse="4BA1"/>
    <student name="Ledwidge" thecourse="4BA5"
thecourse="4BA1"/>
    <student name="ONeill" thecourse="4BA5"/>
</all>
```

## Example Function clause with param

XML Source
Tcd.xml

```
<?xml version="1.0"?>
<assessments>
  <student name="Smith">
      <mark thecourse="4BA5"> 99
        </mark>
      <mark thecourse="4BA1"> 75
        </mark>
  </student>
  <course name="4BA1"
takenby="Smith,Jones">
     <mark>60</mark>
  </course>
  <course name="4BA5"
           takenby="Smith,Bond">
     <mark>70</mark>
  </course>
</assessments>
```

XML Source
tcd2.xml

```
<?xml version="1.0"?>
<assessments>
  <student name="Ledwidge">
      <mark thecourse="4BA5"> 45
</mark>
      <mark thecourse="4BA1"> 55
</mark>
  </student>
  <student name="ONeill">
      <mark thecourse="4BA5"> 85
</mark>  </student> </assessments>
```

XQuery

```
declare function local:
find_students($stuname as xs:string)
   {
for $s in
doc("data/tcd.xml")/assessments/student
union
doc("data/tcd2.xml")/assessments/studen
t
where $stuname = string($s/@name)
return
<student>
         {$s/@name}
         {$s/mark/@thecourse}
</student>
   };

local:find_students("Smith")
```

Result

```
<student name="Smith" thecourse="4BA5"
thecourse="4BA1"/>
```