

#### Case Study

Westmuni is a university specialised in the delivery of wide range of IT courses to Undergraduate students.

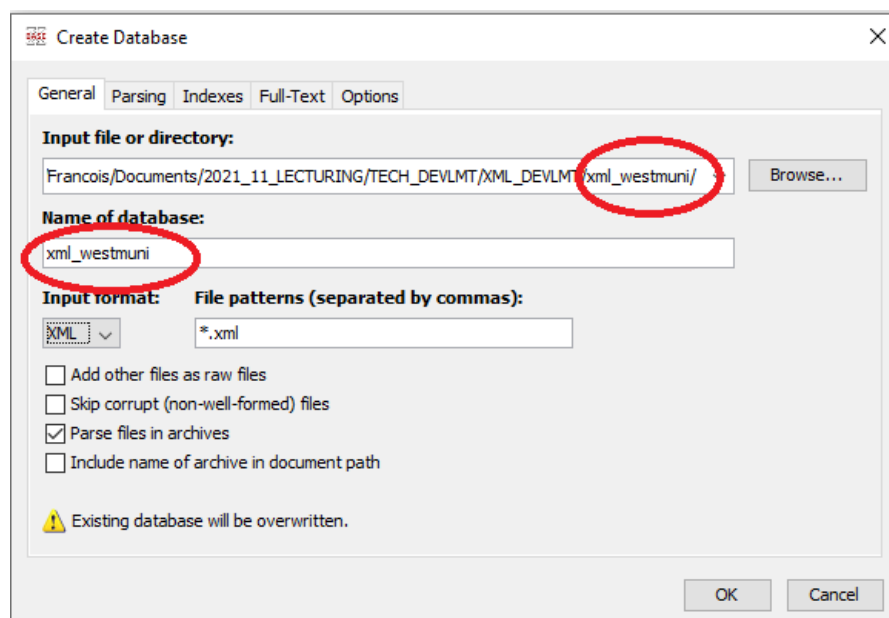
#### Setting Up: Re-creating the XML database on BaseX

##### i. Access the xml\_westmuni directory

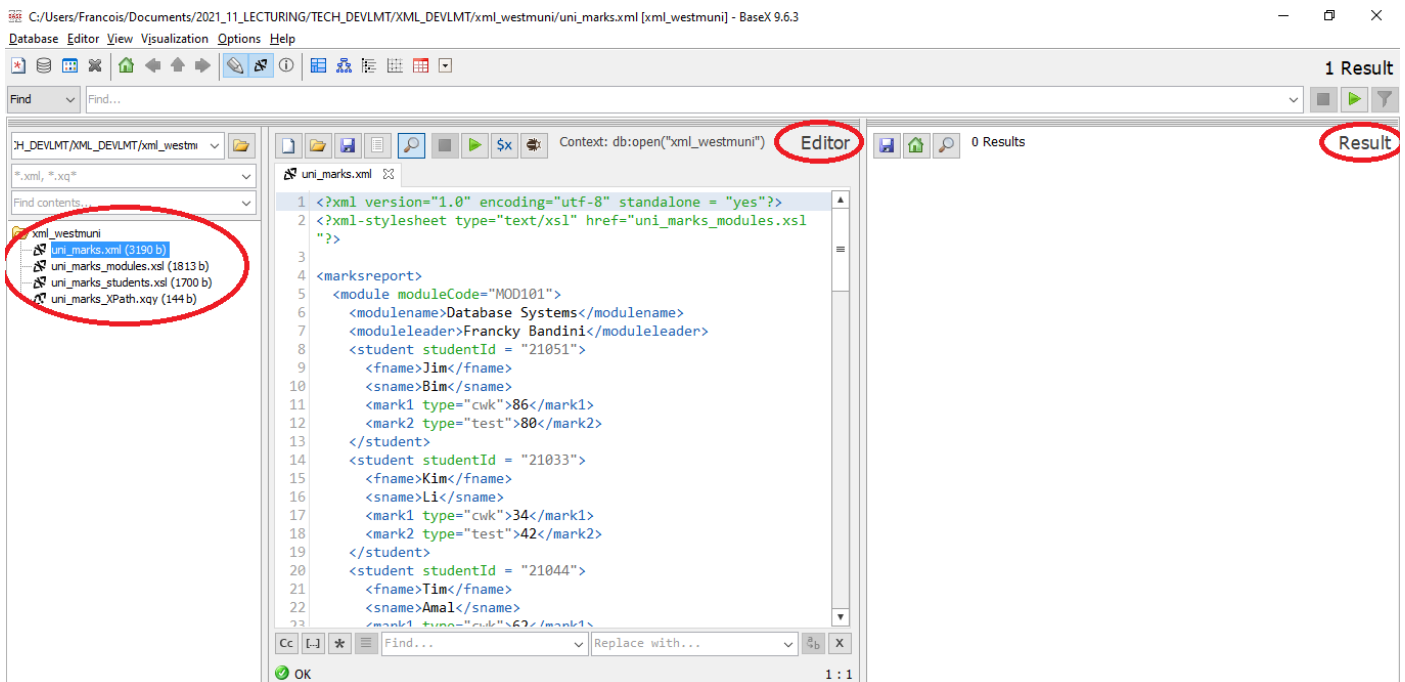
1. Access your previously created **directory** locally on your machine called **xml\_westmuni**.
2. Check that your **xml\_westmuni directory** now contains the following files (see tutorial 09)
  - The XML document **uni\_marks.xml**: the XML source document.
  - The XPath file **uni\_marks\_XPath.xqy**: the file that contains the XPath expressions.
  - The XSLT file **uni\_marks\_modules.xsl**: the file that contain the transformations for the first rendering.
  - The XSLT file **uni\_marks\_students.xsl** (only if you managed to completely finish tutorial 09, it is OK if you have not, as it is not needed for this present tutorial 10): the file that contain the transformations for the second rendering.

##### ii. Re-Create your XML database on BaseX

1. Locate **BaseX** on AppsAnywhere <https://appsanywhere.westminster.ac.uk> and launch it.
2. Alternatively, download BaseX from <https://basex.org/> if you are using your own machine.
3. Create a **New Database** on BaseX. Click on “Database” on the top nav bar and select “New”.
4. Click browse and locate your xml\_westmuni directory.
5. Name your **XML database** as **xml\_westmuni** (same name as your directory) and click OK.



6. Use the browsing tool on the left hand-side to bring up your **xml\_westmuni** directory and open the **uni\_marks.xml** document in the editor. You can also use the View tab on the menu on the top nav bar to display the result pane on the right hand-side and hide any other panes, if you so wish (see tutorial 09).



## Tutorial 10 Task 01: Creating your XQuery file on BaseX

1. Create a new file (of type .xqy) to write your XPath expressions. Click on the "New" icon to open a new tab.
2. Click on the "Save" icon to save the new file as **uni\_marks\_XQuery.xqy** in the same directory xml\_westmuni.
3. Type in a comment between (: and :) at the top of your **uni\_marks\_XQuery.xqy** file e.g.

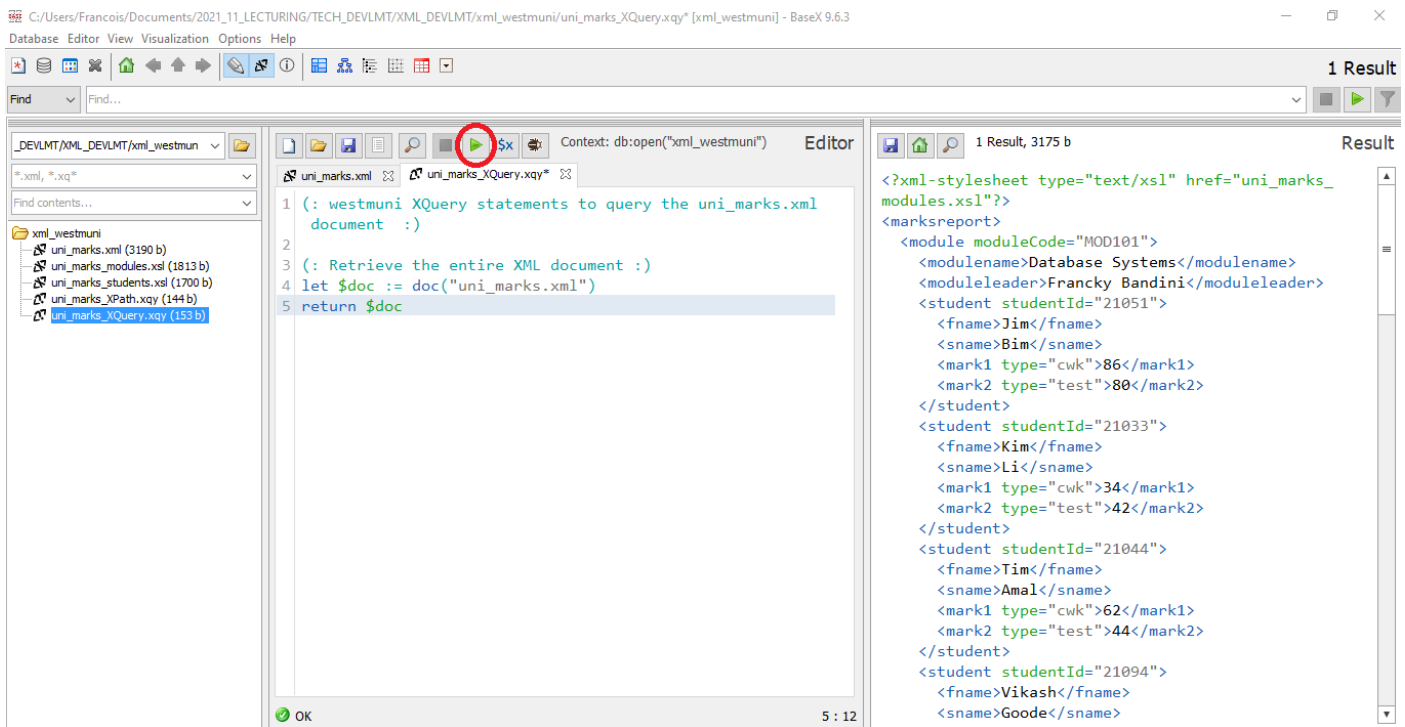
(: westmuni XQuery statements to query the uni\_marks.xml document :)

4. Write your first XQuery statement in your editor to retrieve the whole XML document and a comment just above it.

(: Retrieve the entire XML document :)

```
let $doc := doc("uni_marks.xml")
return $doc
```

5. Click on the green "run query" button immediately above your tab to execute it. View the result on the pane on the righthand-side. You should be able to view the full XML document being retrieved (see screenshot below).



7. Continue writing your XQuery statements in the editor. For every expression, you can comment and uncomment it to execute it, one by one, by clicking on the green “run query” button.

## Tutorial 10 Question 01: Simple XQuery statements

- a) Return the modules nodes and descendants.
- b) Return the module names and module leaders.
- c) Return the student nodes and descendants. 2 possible answers: one iterates through the student node, the other one iterates through the module node.
- d) Return the student first names and surnames of all students taking modules. 2 possible answers: one iterates through the student node, the other one iterates through the module node.

## Tutorial 10 Question 02: XQuery statements with condition on element

- a) Return all the details for the module called "Database Systems".
- b) Return the surnames of the students on the "Database Systems" module. 2 possible answers: one iterates through the student node, the other one iterates through the module node.
- c) Return the details of the module and students who have scored more than 40 in the first component of the assessment.
- d) Return the details of the module and students on the Database Systems module who have scored more than 40 in the first component of the assessment.
- e) Return the details of the module and students on the Database Systems module who have scored more than 40 in the first component of the assessment.

### Tutorial 10 Question 03: XQuery statements with condition on attribute

- a) Return the details of the students on the module identified by the code "MOD102".
- b) Return a list of students and their marks on the MOD102 module for the students who have scored more than 70 either on the first or second component.

### Tutorial 10 Question 04: XQuery statements with sequence functions

- a) Write a report that retrieves the name of the module, the surname of the student, the mark scored in both components and a calculation of the final mark if every component is worth 50%.
- b) Write a report that retrieves the name of the module and the number of students on each module.
- c) Write a statistical report that provides the following info: for each module, the lowest, highest and average mark on the first component, as well as the lowest, highest and average mark on the second component. Use distinct values to group by and calculate min, max and average.