School of Information Technology
Department of Computer Science

UNIVERSITEIT VAN PRETORIA
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Faculty of Engineering, Built Environment and Information Technology

COS326 Database Systems:
Practical 6 2024

Release Date: 09 September 2024
Submission Date: 16 September 2024 @ 23:59
Lecturer: Mr S.M Makura

Total: 50 Marks

Objectives

In this practical you will use BaseX to execute XQuery queries on XML data. As you know, XQuery uses Xpath and FLWOR expressions. The objectives of this practical are to learn how to query data in an XML database and appreciate the difference between structured and semi-structured data.

Submission Procedure:

When you are done:

1. You must submit the file named:
   a. **FLWORQueries.txt which** contains all your queries.
   b. Compress the above document into an archive and upload it to the ClickUP link for practical submissions **before** the due date/time. The file name for the archive must have your student number as part of the file name, e.g. ***uXXXXXXXX.zip*** (*XXXXXXXX is your student number).*

Preparation

For this practical exercise, you will use the BaseX XML database software to execute XQuery queries on XML data. The BaseX software version that you will be using is BaseX 11.2. It can be downloaded from http://www.basex.org . You will also find documentation.

If you need more information on FLWOR queries, you can visit the http://www.w3schools.com website.

Scenario

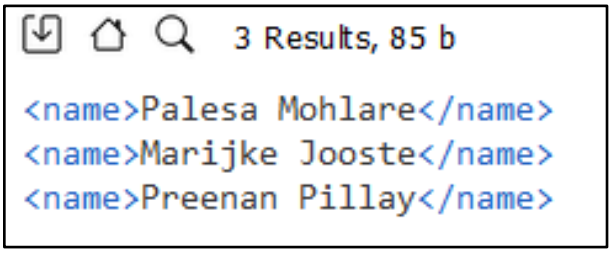
You are provided with the *students.xml and courses.xml* files. Use BaseX to create a new database for the files and write FLWOR queries for the tasks listed below.

Task 1: FLWR Expressions

(**Note:** you are supposed to write FLWOR expressions **only** here)

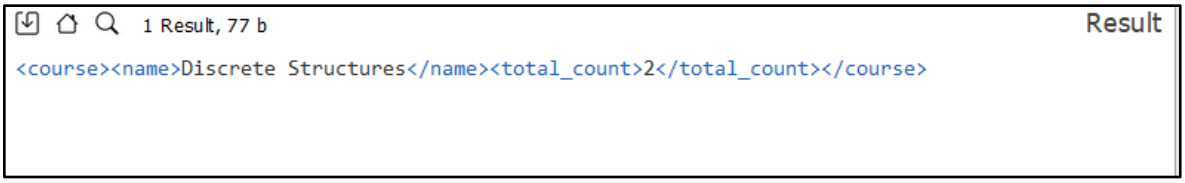
Question 1: List the names of students enrolled in the "Database Systems" course. [3 Marks]

Expected Output:



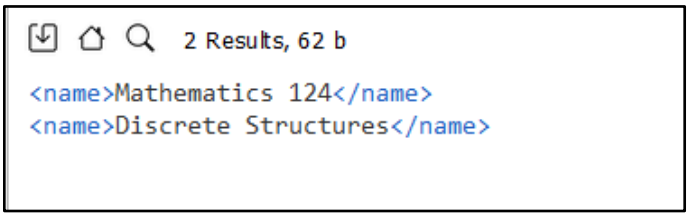
Question 2: Count the total number of students enrolled in "Discrete Structures" course. [5 Marks]

Expected Output:



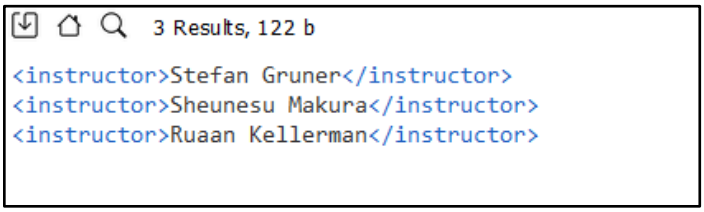
Question 3: List all courses offered by the "Mathematics" department. [3 Marks]

Expected Output:



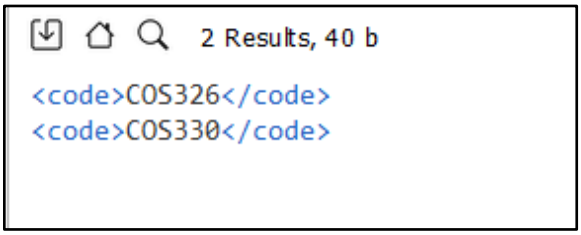
Question 4: Find the names of instructors teaching courses taken by “Marijke Jooste” [4 Marks]

Expected Output:



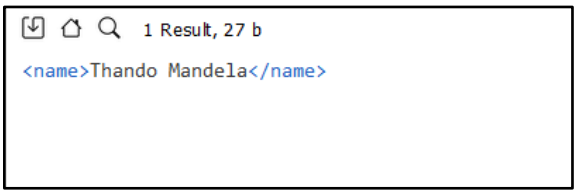
Question 5: List the course codes of all courses that have exactly 18 credits. [3 Marks]

Expected Output:



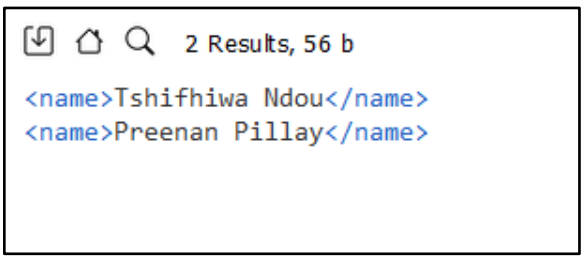
Question 6: List the names of students who are enrolled in both "Introduction to Computer Science" and "Mathematics 124" courses. [6 Marks]

Expected Output:



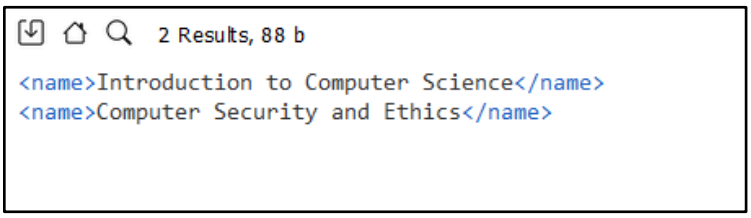
Question 7: List the names of students who are not enrolled in any course offered by the "Mathematics" department. [6 Marks]

Expected Output:



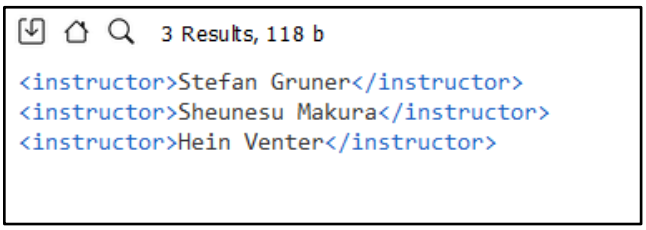
Question 8: List the names of courses that have more than 3 students enrolled. [6 Marks]

Expected Output:



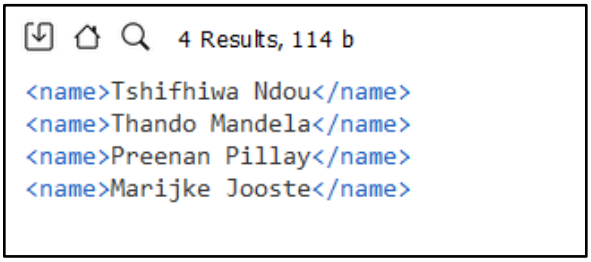
Question 9: Find the names of instructors whose courses are being taken by more than two students. [6 Marks]

Expected Output:



Question 10: List the names of students studying first year courses offered by the Department of Computer Science in descending order. [8 Marks]

Expected Output:



[Total Marks: 50]