

School of Information Technology

Department of Computer Science

COS326 Database Systems: Practical 5 2025

Release Date: 02 September 2025

Submission Date: 09 September 2025 @ 23:59Hrs

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. **XQueries.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. ***uXXXXXXXXX_Surname_Initials(XXXXXXXXX is your student number) e.g u12345678_Smith_JN***
2. The practical will be marked through a live demo on Discord.

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 12.0. It is available on <http://www.basex.org>. You will also find documentation and a demo section at the URL. A video demo done in lecture is available on ClickUP. If you need more information on XPath and XQuery you can visit the <http://www.w3schools.com> website.

NO LATE submissions will be accepted after the submission date and time has lapsed. Do not wait till the last minute to submit and start giving excuses that you faced technical challenges when you tried to submit.

Scenario

You are provided with the *Library.xml* file. Use BaseX to create a new database for the *Library.xml* file and write XPath and FLWR queries for the tasks listed below.

Task 1: XPath Expressions

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

Question 1: List the names of authors who have published books in the library. [2 Marks]

Expected output:

```
⌵ ⌶ 🔍 6 Results, 171 b
<name>J.D. Salinger</name>
<name>Harper Lee</name>
<name>George Orwell</name>
<name>F. Scott Fitzgerald</name>
<name>Ray Bradbury</name>
<name>Raymond Chandler</name>
```

Question 2: List the titles of books published in 1953. [3 Marks]

Expected output:

```
⌵ ⌶ 🔍 3 Results, 91 b
<title>Nine Stories</title>
<title>Fahrenheit 451</title>
<title>The Long Goodbye</title>
```

Question 3: Get the titles of books by authors with more than 5 editions of their books. [4 Marks]

Expected output:

```
⌵ ⌶ 🔍 2 Results, 57 b
<title>To Kill a Mockingbird</title>
<title>1984</title>
```

Question 4: Get the number of editions for the book "The Catcher in the Rye" by J.D. Salinger. [5 Marks]

Expected output:

```
1 Result, 22 b
<editions>5</editions>
```

Question 5: List the names of authors who have published books with more than 5 editions and were published after 1950. [5 Marks]

Expected output:

```
2 Results, 51 b
<name>J.D. Salinger</name>
<name>Harper Lee</name>
```

Task 2: FLWR Expressions

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

Question 6: List the names of authors who have published more than one book. [4 Marks]

Expected output:

```
1 Result, 26 b
<name>J.D. Salinger</name>
```

Question 7: Get the titles of books published by authors with the last name "Lee". [5 Marks]

Expected output:

```
1 Result, 36 b
<title>To Kill a Mockingbird</title>
```

Question 8: Get the author(s) with books published between 1950 and 1960.

Arrange the author names in ascending order. [8 Marks]

Expected output:

```
3 Results, 84 b
<name>Ray Bradbury</name>
<name>Raymond Chandler</name>
<name>J.D. Salinger</name>
```

Question 9: Get the author with the highest number of editions of a book. [6 Marks]

Expected output:

```
1 Result, 26 b
<name>George Orwell</name>
```

Question 10: List all authors who have published books before 1950 and after 1960. [8 Marks]

Expected output:

```
3 Results, 85 b
<name>Harper Lee</name>
<name>George Orwell</name>
<name>F. Scott Fitzgerald</name>
```

[Total Marks: 50]