

# Querying XML Data with XQuery and DB2 9

CDT729

XQuery 1.0 is the new standard for searching, extracting, and manipulating XML content stored in databases. This course includes a review of the XQuery standard as well as extensive hands-on examples of XQuery coding techniques. Although the XQuery content in this course is equally applicable to any XQuery implementation, particular emphasis is given to using XQuery with DB2 9. All student exercises will be done using DB2 9.

## Audience

- Anyone who is interested in retrieving XML data using XQuery
- Anyone who is interested in developing XML applications using DB2 9

## Prerequisites

- CDT753, Introduction to XML

## Course Length

- Three days

## Learning Objectives

- Identify the roles that XQuery can play in an XML-based solution.
- Code and test queries using path expressions.
- Code and test queries using FLOWR expressions.
- Code and test queries that use sorting and grouping.
- Build a query using DB2 9 Developer Workbench and the XML Query Builder.
- Understand XML processing issues specific to DB2 9.

## Teaching Methods

- Lecture
- Hands-on examples and exercises

## Course Outline

TG5

### Introduction to XQuery

- What is XQuery?
- Easing into XQuery
- Path Expressions
- FLOWRs
- Adding XML Elements and Attributes
- Functions
- Joins
- Aggregating and Grouping Values

### XQuery Foundations

- The Design of the XQuery Language
- XQuery in Context
- Processing Queries
- The XQuery Data Model
- Types
- Namespaces

### Expressions: XQuery Building Blocks

- Categories of Expressions
- Keywords and Names
- Whitespace in Queries
- Literals
- Variables
- Function Calls
- Comments
- Evaluation Order and Parentheses
- Comparison Expressions
- Conditional Expressions
- Logical Expressions

### Navigating Input Documents Using Paths

- Path Expressions
- Predicates
- Dynamic Paths
- Input Documents
- A Closer Look at Context

### Adding Elements and Attributes to Results

- Including Elements and Attributes From the Input Document
- Direct Element Constructors
- Computed Constructors

### Selecting and Joining Using FLOWRs

- Selecting with Path Expressions
- FLOWR Expressions
- Quantified Expressions
- Selecting Distinct Values
- Joins

### Sorting and Grouping

- Sorting in XQuery
- Grouping
- Aggregating Values

### Functions

- Built-in Versus User-Defined Functions
- Calling Functions
- User-Defined Functions

### Advanced Queries

- Copying Input Elements with Modifications
- Working with Positions and Sequence Numbers
- Combining Results
- Using Intermediate XML Documents

### Namespaces and XQuery

- XML Namespaces
- Namespaces and XQuery
- Namespace Declarations in Queries
- Controlling Namespace Declarations in Your Results

### A Closer Look at Types

- The XQuery Type System
- The Built-in Types
- Types, Nodes, and Atomic Values
- Type Checking in XQuery
- Automatic Type Conversions
- Sequence Types
- Constructors and Casting

### Using Schemas with XQuery

- What Is a Schema?
- Why Use Schemas with Queries?
- W3C XML Schema: Brief Overview
- In-Scope Schema Definitions
- Schema Validation and Type Assignment
- Sequence Types and Schemas

### Principles of Query Design

- Clarity
- Modularity
- Robustness
- Error Handling
- Performance

### Techniques for Specific Data Types

- Numbers
- Strings
- Regular Expressions
- Times, Dates and Durations

### DB2 9 - Specific XML Issues

- Using SQL/XML to retrieve and publish XML Data
- Embedding XQuery Inside SQL
- Creating queries using Developer Workbench and the XML Query Builder

