

**CS 548—Fall 2017**  
**Enterprise Software Architecture and Design**  
**Assignment Three—XQuery**

In the previous assignment, you defined XML schemae and sample data for a medical information system. In this assignment, you should define XQuery programs that operate on one of these solutions, that solution based on the use of a choice element to define different medical treatments.

Define the following XQuery functions in an Xquery program, that tests these functions on sample input data. Provide a report that includes both the sample input data and output data:

1. Define an Xquery function `getPatientTreatments(patient-id, database)` that returns, for a given patient in the Clinic database, a list of the treatment records for that patient. The Clinic database is an argument to the function (as an XML element).
2. Define an Xquery function `getPatientDrugs(patient-id, database)` that returns, for a given patient in the Clinic database, a list of the drugs that that patient is receiving, along with the *diagnosis and* dosage for each drug treatment. The Clinic database is an additional argument to the function.
3. Define an Xquery function `getTreatmentInfo(database)` that constructs a new database from a Clinic database. The latter database is an argument to the function. The output of this function lists records for all treatments currently being administered (drug, surgery or radiology), along with the patient receiving the treatment (i.e., their patient identifier) and the provider administering the treatment (i.e., their provider identifier).
4. Define an Xquery function `getProviderInfo(database)` that constructs a new database from a Clinic database. The latter database is an argument to the function. The output of this function lists, *for each provider*, a list of all patients that that provider is currently treating, and for each such patient a list of the treatment records (drug, surgery or radiology) that the provider is administering to that patient.
5. Define an Xquery function `getDrugInfo(database)` that constructs a new database from a Clinic database. The output database lists, *for each drug*, all of the patients undergoing treatment with that drug, the *diagnosis and* dosage, and the prescribing physician.

**You should use the Oxygen XML Editor to edit and test your solutions<sup>1</sup>.** Put all of your Xquery code in one module (called “`solutions.xq`”), to be imported by a testing program that demonstrates your solutions. Put the testing program in files, called “`testing1.xq`”, “`testing1.xq`”, etc, one for each question above. Record one

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<sup>1</sup> You will need to use the Saxon EE runtime, which enables XML Schemas, in order to be able to use “import schema” in your XQuery code.

or more videos demonstrating your testing of your code. Run each test program using the Oxygen Xquery Debugger, showing the output pane after running each query.

Make sure that your name appears at the beginning of the video. For example, display your name at the start of testing output. *Do not provide private information such as your email or cwid in the video.* Be careful of any “free” apps that you download to do the recording, there are known cases of such apps containing Trojan horses, including key loggers.

Your solution should be uploaded via the Canvas classroom, as a zip file. This zip file should have the same name as your Canvas userid. It should unzip to a folder with this same name, which should contain the files and subfolders with your submission.

**It is important that you provide a document that documents your submission, included as a PDF document in your submission root folder. Name this document README.pdf. *This document should provide your XQuery code and your test data, and explain where to find the videos of your testing for your submission, and any observations you have to make about design decisions you made during the assignment.***