University of Toronto
CSC343 Winter 2017

In-class Exercises: XPath and XQuery

Make sure that you have each of the following files, either on a hard-copy handout, or on your laptop/device: quiz.xml, races.xml, and the trio of more elaborate quiz-related files: bank.xml, quiz.xml and class.xml.

1. In quiz.xml find the solution to every question.

   Solution:

   ```
   Solutions are stored in the answer attribute.
   We need to find this attribute whether the question is an MCQuestion, a TFQuestion or a
   NumericQuestion.  This means we can't spell out a single path to the attribute.

   One solution is to use a wildcard for the element that could be one of three things:
               fn:doc("quiz.xml")/quiz/questions/*/@solution

   Or we can be even less explicit about the path:
               fn:doc("quiz.xml")/quiz/questions//@solution
   ```

2. In races.xml, find all the runner's names.

   Solution:

   ```
   fn:doc("races.xml")/races/runner/fullname
   ```

3. Find all the names of races.

   Solution:

   ```
   fn:doc("races.xml")/races/race/@name
   ```

4. Find all race results for runner r1.

   Solution:

   ```
   fn:doc("races.xml")/races/race/result[@who='r1']
   ```

5. Find out who had a race result over 3.5.

   Solution:

   ```
   This solution finds every race result that is itself over 3.50, and then reports the
   person who had that result.
   fn:doc("races.xml")/races/race/result[.>3.50]/@who
   Here is its output:
               attribute who {"r85"},
               attribute who {"r1"},
               attribute who {"r85"},
               attribute who {"r70"},
               attribute who {"r98"}
   ```

```
This query is very similar, but it is incorrect.
It finds all race elements that have a result over 3.50, and then reports
every person who has a result in one of these races:
fn:doc("races.xml")/races/race[result>3.50]/result/@who
Here is its output:
            attribute who {"r12"},
            attribute who {"r85"},
            attribute who {"r1"},
            attribute who {"r85"},
            attribute who {"r1"},
            attribute who {"r70"},
            attribute who {"r98"}
The difference is subtle!
```

6. Find out who had a race result over 3.5 in the Run for the Cure.

   Solution:

   ```
   fn:doc("races.xml")//race[@name="RunForTheCure"]/result[.>3.50]/@who
   ```

7. In file bank.xml, find all the hints for all the multiple-choice questions.

   Solution:

   ```
   Here we spell the path out explicitly:
      fn:doc("bank.xml")/QuestionBank/Question/MCQuestion/OptionList/Option/Hint

   Here we take the laziest possible way of expressing the query:
      fn:doc("bank.xml")//Hint
   But this doesn't work because it includes hints to true-false questions.

   This is as lazy as we can get away with:
      fn:doc("bank.xml")//MCQuestion//Hint
   ```

8. In file class.xml, find the sid of all students who answered question MC-08.

   Solution:

   ```
   Here we go down to the QuestionResponse element, pick the ones we want,
   and then go back up to the parent node to get the sid out.
      fn:doc("class.xml")/ClassResponses/Student/QuestionResponse[@QID="MC-08"]/parent::Student/@sid

   Here we don't go below the QuestionResponse element, so we don't have to go back up.
      fn:doc("class.xml")/ClassResponses/Student[QuestionResponse/@QID="MC-08"]/@sid
   ```