

## 2. Unit: Querying with XPath

Solve the following exercises using XPath only.

### Exercise 2.1 (XPath: Mondial)

- Find out which countries are neighbors of Russia and have more than 10 million inhabitants.
- Which countries are members of the NATO? Return the countries' names.
- Give the names of countries with a neighbor country with a mountain of 4000 m and higher.

### Exercise 2.2 (XPath: Hamlet)

- List all scenes with less than 10 persons speaking by their titles.
- Give the names of all persons speaking in both the first and the last act.  
Give the names of all persons speaking in the first act, but *not* speaking in the last act?
- What happens (stage directive) directly before King Claudius says: "Part them; they are incensed."?
- Who says what in the 187th speech overall?  
The other way round (and harder): Give the query with which one can find out that the SPEECH where "Something is rotten in the state of Denmark" is said, is the 187th.

### Exercise 2.3 (XPath: Mondial (2))

- Which (country) capitals are located at a river, sea or lake? Give their names.
- Give the names of all capitals located at a lake.
- Give the names of all lakes with no city located at them.
- Give the names of all rivers flowing through some capital.
- Find all "german leaf-nodes", which means all element nodes that are sub-nodes of the country-element of Germany and have no children.
- In Mondial, there exist city elements as sub-elements of province elements, and city elements as sub-elements of country elements. Are there any other city elements?

### Exercise 2.4 (XPath: Mondial (3))

These are some really hard examples for pure XPath.

Try to solve them with XPath, otherwise use XQuery.

- Which organizations have at least one member on each continent? Give their names.
- Give the names of all mountains that are the highest ones on the continent where they are located.

### Exercise 2.5 (XML Tree and XPath Axes)

Consider the XPath axes in a document. Provide equivalent characterizations of the "following" axis and of the "preceding" axis

- in terms of "preorder" and "postorder" (i.e., enumeration in a preorder/postorder tree traversal),
- in terms of other axes.