

XPath Exercise Sheet

Web Data Models

October 8th, 2018

Consider the XML document below:

```
<books>
  <title text="Introduction to the Theory of Computation" />
  <title text="Foundations of Databases" >
    <author>
      <name>Serge Abitebould</name>
      <author>
        <name>Victor Vianu</name>
        <name>Richard Hull</name>
      </author>
    </author>
    <publisher>
      <name>Addison Wesley</name>
      <edition>1</edition>
    </publisher>
  </title>
</books>
```

Question 1 In the above document, the *context* node is the node labelled `author`, uniquely identified by the XPath query `/books/title/author`.

Consider the following XML axes:

1. following
2. preceding
3. child
4. preceding-sibling
5. descendant-or-self

For each axis, give the list of nodes as their *pre-order node ID*, considering that the root of the document has ID 0.

Question 2 Consider again the XML document above. For each of the XPath queries below, give the list of the XML document nodes satisfying the query, as a sequence of node IDs, where each ID is the *pre-order* ID, considering that the root of the document is the node having ID 0:

1. //author/name
2. //title[/*]
3. //publisher[child::name]
4. //author[parent::author and preceding-sibling::author]
5. //name[parent::publisher[child::edition] or parent::author[child::name]]

Question 3 Detail the execution of the stack-based algorithm for simple XPath queries on the above XML document and for the query $Q := //books/title/author$. Detail the steps of the algorithm, the data structures used, and the results.