CSC343 Worksheet 10

June 28, 2020

1. **Exercise 12.1.1:** Figures 12.4 and 12.5 are the beginning and end, respectively, of an XML document that contains some of the data from our running products exercise. Write the following XPath queries. What is the result of each?

```
    <Maker name = "E">
        <PC model = "1011" price = "959">
            <Speed>1.86</Speed>
            <RAM>2048</RAM>
            <HardDisk>160</HardDisk>
        </PC>
        <PC model = "1012" price = "649">
            <Speed>2.80</Speed>
            <RAM>1024</RAM>
            <HardDisk>160</HardDisk>
        </PC>
        <Laptop model = "2001" price = "3673">
            <Speed>2.00</Speed>
            <RAM>2048</RAM>
            <HardDisk>240</HardDisk>
            <Screen>20.1</Screen>
        </Laptop>
        <Printer model = "3002" price = "239">
            <Color>false</Color>
            <Type>laser</Type>
        </Printer>
    <Maker name = "H">
        <Printer model = "3006" price = "100">
            <Color>true</Color>
            <Type>ink-jet</Type>
        </Printer>
        <Printer model = "3007" price = "200">
            <Color>true</Color>
            <Type>laser</Type>
        </Printer>
    </Maker>
</Products>
```

a) Find the amount of RAM on each PC.

b) Find the price of each product of any kind.

c) Find all the printer elements.

d) Find the makers of laser printers.

e) Find the makers of PC's and/or laptops.

f) Find the model numbers of PC's with a hard disk of at least 200 gigabytes.

2. **Exercise 12.1.2:** The document of Fig. 12.6 contains data similar to that used in our running battleships exercise. In this document, data about ships is nested within their class element, and information about battles appears inside each ship element. Write the following queries in XPath. What is the result of each?

```
    <Maker name = "E">
        <PC model = "1011" price = "959">
            <Speed>1.86</Speed>
            <RAM>2048</RAM>
            <HardDisk>160</HardDisk>
        </PC>
        <PC model = "1012" price = "649">
            <Speed>2.80</Speed>
            <RAM>1024</RAM>
            <HardDisk>160</HardDisk>
        </PC>
        <Laptop model = "2001" price = "3673">
            <Speed>2.00</Speed>
            <RAM>2048</RAM>
            <HardDisk>240</HardDisk>
            <Screen>20.1</Screen>
        </Laptop>
        <Printer model = "3002" price = "239">
            <Color>false</Color>
            <Type>laser</Type>
        </Printer>
    <Maker name = "H">
        <Printer model = "3006" price = "100">
            <Color>true</Color>
            <Type>ink-jet</Type>
        </Printer>
        <Printer model = "3007" price = "200">
            <Color>true</Color>
            <Type>laser</Type>
        </Printer>
    </Maker>
</Products>
```

a) Find the names of all ships.

b) Find all the Class elements for classes with a displacement larger than 35000.

c) Find all the Ship elements for ships that were launched before 1917.

d) Find the names of the ships that were sunk.

e) Find the years in which ships having the same name as their class were launched.

f) Find the names of all ships that were in battles.

3. **Exercise 12.2.1:** Using the product data from Figs. 12.4 and 12.5, write the following in XQuery.

a) Find the Printer elements with a price less than 100.

b) Find the Printer elements with a price less than 100, and produce the sequence of these elements surrounded by a tag <CheapPrinters>.

c) Find the names of the makers of both printers and laptops.

d) Find the names of the makers that produce at least two PC's with a speed of 3.00 or more.

e) Find the makers such that every PC they produce has a price no more than 1000.

4. **Exercise 12.2.2:** Using the battleships data of Fig. 12.6, write the following in XQuery.

a) Find the names of the classes that had at least 10 guns.

b) Find the names of the ships that had at least 10 guns.

c) Find the names of the ships that were sunk.

d) Find the names of the classes with at least 3 ships.

e) Find the names of the classes such that no ship of that class was in a

5. **Exercise 12.2.3:** Solve the problem of Section 12.2.5; write a query that finds the star(s) living at a given address, even if they have several addresses, without finding stars that do not live at that address.

6. **Exercise 12.2.4:** Do there exist expressions E and F such that the expression every $x in E satisfies F is true, but some $x in E satisfies F is false? Either give an example or explain why it is impossible.