

Quizzes for TopModCS Spring 2016

Michael Kohlhase
Jacobs University Bremen
FOR COURSE PURPOSES ONLY

May 6, 2016

Contents

1	Quiz 1 (Introductory Quiz) – Given Feb. 9. 2016	2
2	Quiz 2 (Numbers and Documents) – Given Feb. 16. 2016	3
3	Quiz 2 (Uniform Resource Identifiers) – Given Feb. 22. 2016	4
4	Quiz 4 (URIs) – Given Mar. 1. 2016	5
5	Quiz 5 (CSS) – Given Mar. 8. 2016	6
6	Quiz 6 (Web Applications) – Given Mar. 15. 2016	7
7	Quiz 7 (Web Applications) – Given Mar. 29. 2016	8
8	Quiz 8 (XSLT and EPUB) – Given Apr. 5. 2016	9
9	Quiz 8 (Revision Control Basics) – Given Apr. 12. 2016	10
10	Quiz 10 (Revision Control Basics) – Given Apr. 19. 2016	11
11	Quiz 11 (Issue Trackers) – Given Apr. 26. 2016	12

1 Quiz 1 (Introductory Quiz) – Given Feb. 9. 2016

Problem 1.1 (TopModCS Grading)

State the components of the overall grade of the TopModCS course and discuss their intention. 4pt

Problem 1.2 (Character Encodings)

8pt

Briefly introduce and discuss the relative merits of

1. the ASCII code,
2. the ISO-Latin codes,
3. the Universal Character Set, and
4. the Unicode encodings UTF-8, UTF-16, and UTF-32

2 Quiz 2 (Numbers and Documents) – Given Feb. 16. 2016

Problem 2.1 Write down your date of birth in DDMM format (e.g. 3009 for September 30th) and (considering it as decimal number) represent it as a binary, octal, and hexadecimal number, respectively. 9pt

Problem 2.2 (Size of Typewritten Documents)

A typewritten page has about 30 lines of 80 characters each. If we were to encode a 50-page manuscript (e.g. your bachelor's thesis) in ASCII, how many bytes would the document have. 3pt

3 Quiz 2 (Uniform Resource Identifiers) – Given Feb. 22. 2016

Problem 2.1 (The Role of URIs)

Explain the role of URIs in the World Wide Web. Why do we need to standardize for them? 6pt

Problem 2.2 (Uniform Resource Identifiers)

Explain the syntax of a URI by its parts. You can use the following example to help you in your explanation: 6pt

```
http://thelast.net:80/problem?course=topmodcs#solution
```

4 Quiz 4 (URIs) – Given Mar. 1. 2016

Problem 4.1 (HTML Schedule)

Create a simple but complete HTML page, in which you list the classes you have at one day. Start by making a title with the day of the week you picked. Then list your classes in an ordered list. Each entry should contain the name of the class in *italics* letters, the time slot in **bold**, and the name of the instructor without any embellishments. 12pt

Please list at least three classes! If you do not have a day with three classes, list lunch and dinner.

5 Quiz 5 (CSS) – Given Mar. 8. 2016

Problem 5.1 (CSS)

Consider the following HTML:

12pt

```
<html>
  <head>
    <link rel="stylesheet" type="text/css" href="style.css"/>
  </head>
  <body>
    <div class="title">Pancake Ingredients</div>
    <div class="ingredient">
      <span class="type">Flour</span> – <span class="amount">A lot</span>
    </div>
    <div class="ingredient">
      <span class="type">Milk</span> – <span class="amount">Less</span>
    </div>
    <div class="ingredient">
      <span class="type">Eggs</span> – <span class="amount">A few</span>
    </div>
  </body>
</html>
```

Create the style sheet `style.css`, such that

- The title has a larger font size
- There is a box around each ingredient
- There is some padding in the ingredient boxes
- The ingredient types are bold
- The amounts are in italics

Please make sure that your syntax is correct!

6 Quiz 6 (Web Applications) – Given Mar. 15. 2016

Problem 6.1 (Web Applications)

Explain the terms web application and web application framework. Give one example 8pt for each and name/briefly explain the parts of the latter.

Problem 6.2 (Cookies for eCommerce)

An eCommerce site wants to keep a purchases record for each of its customers. Describe/- 4pt explain how this can be done with cookies (explain the concept of cookies as you go along).

7 Quiz 7 (Web Applications) – Given Mar. 29. 2016

Problem 7.1 (RELAX NG)

Given the following RELAX NG pattern:

12pt

```
<element name="a" xmlns="http://relaxng.org/ns/structure/1.0">
  <zeroOrMore>
    <element name="b">
      <attribute name="id">
        <text/>
      </attribute>
    <oneOrMore>
      <element name="c">
        <text/>
      </element>
    </oneOrMore>
  </element>
</zeroOrMore>
</element>
```

or in the compact representation

```
element a {
  element b {
    attribute id { text },
    element c { text }+
  }*
}
```

Your tasks are the following

1. Write down an XML file with at least 6 element nodes, corresponding to the provided pattern.
2. Write XPath expressions matching
 - (a) Every node `c`
 - (b) Every node `b` that has the `id` value `"topmodcs"`
 - (c) Every node `c` that is the first child of a node `b` with `id` value `"topmodcs"`

8 Quiz 8 (XSLT and EPUB) – Given Apr. 5. 2016

Problem 8.1 (XSLT)

Consider the following XML document on the left, what do you get after applying the following XSLT on the right to it? 8pt

<pre><a> <b x="A"/> <c> <b x="B"/> <b x="C"/> <c> <b x="D"/> </c> </c> </pre>	<pre><xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"> <xsl:template match="/"> <a> <xsl:apply-templates select="//b"/> </xsl:template> <xsl:template match="//b"> <d><xsl:value-of select="@x"/></d> </xsl:template> </xsl:stylesheet></pre>
---	--

Problem 8.2 (EPUB)

Please answer the following questions as precisely as possible:

4pt

1. What is the motivation behind the ePub standard? Why is it not popular among large publishers?
2. What is the difference between a zip archive and an epub file?

9 Quiz 8 (Revision Control Basics) – Given Apr. 12. 2016

Problem 8.1 (DropBox Communication)

Briefly explain the “dropbox model of collaboration”, where documents are uploaded to a central server. What are its pros and cons (name at least two each). 5pt

Problem 8.2 (Tweedledum and Tweedledee)

Consider the the two versions of the popular nursery rhyme:

7pt

tweedle1.txt	tweedle2.txt
Tweedledum and Tweedledee Agreed to have a battle; For Tweedledum said Tweedledee Had spoiled his nice new rattle.	Tweedle–dum and Tweedle–dee Resolved to have a battle, For Tweedle–dum said Tweedle–dee Had spoiled his nice new rattle.
Just then flew down a monstrous crow, As black as a tar–barrel; Which frightened both the heroes so, They quite forgot their quarrel.	Just then flew by a monstrous crow, As big as a tar barrel, Which frightened both the heroes so, They quite forgot their quarrel.

Write down the [diff file](#) you would get from running `diff tweedle1.txt tweedle2.txt`.

10 Quiz 10 (Revision Control Basics) – Given Apr. 19. 2016

Problem 10.1 (Version Control Systems)

Briefly explain how a [revision control system](#) works and what its advantages are.

12pt

What do the following actions do in git?

1. git pull
2. git push
3. git commit
4. git clone

11 Quiz 11 (Issue Trackers) – Given Apr. 26. 2016

Problem 11.1 (Components of an Issue)

What are the main components of an issue; name at least four.

4pt

Problem 11.2 (Issue Tracker Workflow)

Describe a typical workflow supported by an issue tracker. Name (and very briefly describe) at least 6 steps. 8pt

12 Quiz 12 (Regular Expressions) – Given May 3. 2016

Problem 12.1 (Regular Expressions)

For each of the three [regular expressions](#) below, give three strings that they match (9 in 9pt total).

1. `[Tt]ime?`
2. `[123]*[abc]+`
3. `(.)(.)(.)(.)\3\2\1`