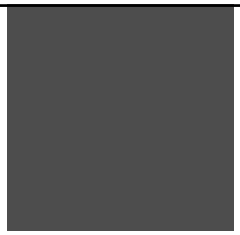

Web Application Development: Review and Exam Matters

Week 12

SWINBURNE UNIVERSITY OF TECHNOLOGY

Lec 1: Overview

- What is an Web application?
- MVC and Client/Server Web Architecture
- Differences between Ajax application model and classic application models
  - Advantages and unique features in using Ajax
- Ajax component technologies
  - XMLHttpRequest (XHR) object, XHTML, DOM, XML, XSLT, Java Script, PHP, CSS
  - Roles of each component technology in building an Ajax web application
- Simple examples for PHP and Ajax - should be really simple now!

2

Lec 2: PHP Types/Operators/Functions/Control Structures

- Variables, constants, expressions
- Different kinds of operators, prefix/postfix (difference), compound assignment
- Types, dynamic typing (use *gettype()* to get the current type of a variable)
- Functions: defining and calling functions
- Control structures
  - Conditional statements
  - Different kinds of loop statements

3

Lec 3: PHP Strings/Files/Directories/Arrays

- Strings: constructing, combining, comparison, parsing, substring, converting between string and arrays
  - Popular string functions, such as *strlen(), strcmp(), substr(), strtok(), explode()*
- Files and directories
- Arrays: accessing elements of array / multi-dimensional array, associative array and keys and sorting

4

Lec 4: MySQL and PHP

- Basics of relational databases
- Basic SQL statements, simple queries, querying multiple tables
- How to manipulate MySQL with PHP
  - Connecting to MySQL *mysqli_connect()*
  - Closing connection *mysqli_close(), mysqli_free_result()*
  - Selecting a database *mysqli_select_db()*
  - Executing SQL statements *mysqli_query()*
  - Selecting records *mysqli_fetch_row(), mysqli_fetch_assoc()*

5

Lec 5: Java Script and DOM

- Java Script
  - Basic functions, built-in objects
  - Browser object model
- Java Script HTML DOM
  - DOM tree
  - Common document object methods and properties
  - Use Java Script HTML DOM API to construct part of the web page
  - *innerHTML* property
- Java Script event models
  - HTML event attributes
  - Different ways of *event registration*

6

Lec 6: Ajax Techniques and XML

- How HTTP works
  - HTTP requests
  - HTTP response
  - Common status code
- XMLHttpRequest (XHR) object – the main Ajax technique
  - Properties*: onreadystatechange, readyState* (values 0 to 4!), *responseText, responseXML, status* (value 200!), *statusText*, etc.
  - Methods: *abort, open, send*, etc.
  - Synchronous/asynchronous usages
  - GET and POST methods, and their difference
  - IE caching problem and solutions for using GET

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Lec 6: Ajax Techniques and XML (Cont'd)

- Difference between XML and HTML
- Components of an XML document (prolog, body with one root element, elements, attributes, …)
- Elements, attributes, entity references
- Well-formed XML documents
  - Well-formedness rules
- Java Script XML DOM and API
  - Common document object methods and properties
  - How to use Java Script XML DOM to extract XML data
- PHP XML DOM and API

8

Lec 7: Ajax and Server-Side Technologies

- The way Ajax works
  - The difference compared with the classic model
- The steps to interact with the server using XHR
  - The client submits request/data to the server (3 sub steps!)
  - The server receives the request (and picks data up in PHP variables)
  - The server does necessary processing, constructs the HTTP response and returns the HTTP response in plain text or JSON or XML
  - The client receives data from the server (using the callback function)
  - The client fetches/processes data from responseXML/responseText, and places required data in the browser document
- PHP DOM
  - Fundamental DOM methods to create returned XML
- Maintaining state information- cookie and session variable

9

Lec 8: XSLT and XPath

- XPath data model
- Context node
- Location steps and abbreviated location steps
  - Axis
  - Node test
  - Predicates
- Absolute and relative XPath expressions
- Able to write XPath expressions for queries
  - Use right axis and predicates
  - Some nodeset functions, e.g., count, sum
  - Arithmetic and logical operators

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Lec 8: XSLT and XPath (Cont'd)

- What can XSLT do?
- Templates for transformation rules: match – action
- Data selection/extraction by XPath expressions
- Understand the context node
- Common XSLT elements
  - xsl:stylesheet, xsl:output, xsl:template, xsl:value-of, xsl:for-each, xsl:if, xsl:sort, xsl:element, xsl:attribute
- Know how to transform to HTML (use HTML tags) or XML formats
- Know how to do XSLT transformation at the client-side
- Know how to do XSLT transformation at the server-side (PHP)

11

Lec 9: Web Services and APIs

- Web service concepts and W3C standard
- APIs similarity and difference compared with Web services
- Two important issues and solutions
  - Same origin policy
  - Firewall

12

Lec 10: Debugging, Patterns, RE and OO PHP

- Appreciate a variety of Ajax patterns
- Regular expressions
  - Basic syntax
  - How to match a string against a regular expression?
- Basic concepts of object-oriented PHP

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Lec 11: JSON and Ajax Frameworks

- Appreciate JSON format
- JSON
  - Comparison between JSON and XML: Pros and cons
  - How to use JSON for sending/receiving data?
- Appreciate Ajax frameworks (e.g., client-side framework – jQuery and server-side framework – SAJAX)

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Examination

- Closed book exam
- 180 minutes (3 hours), 10 min. reading time
- Two sections (80/90 marks in total for COS30020/COS80021)
  - Multiple choice questions
    (20/24 marks, 1 mark each, no deduction if wrong)
  - Short Answer, Code Reading and Code Writing Questions
    (60/66 marks)
- Preparation
  - Review points, lecture notes/examples/books, labs, assignments

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Examination

- Be able to read short PHP codes (lec12/slides 3,4)
- Be able to read / write / change simple Ajax codes (lec12/slides 7-9)
- Be able to read / write simple DOM codes (lec12/slide 8, lec6/slides 53,55)
- Be able to read / write simple PHP/MySQL codes (lec12/slide 5)
- Be able to read / write simple XSLT / XPath codes (lec12/slides 10-11, lab 8)

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