SOEN 287 Study Guide

Web Programming (Concordia University)

SOEN 287 – Final Exam Study Guide

Chapter 1: Fundamentals

- Nothing important. History of the internet and overview of how internet works.

Chapter 2: XHTML

- HTML's syntax has been corrupted by vendors adding more and more tags.
- XHTML is based on XML. XML is a markup language where you can create your own tags. All tags defined for XHTML are defined in its DTD (Document Type Definition), or schema.
- XHTML extends and subsets HTML 4.0.
- The root tag must be HTML.
- Must be well formed.
- All tag attributes and names must be lower case.
- Use of closing tags is mandatory when available.
- Attributes must be key value pairs.
- There can only be one root node.
- Both paragraphs and line breaks
 are used to space out text.
- Whitespace can be preserved <pre></pre>
- Headers can be created with <h1></h1> .... <h6></h6>
  - 1,2,3 are larger than the standard font size, 4 is the standard size, 5 and 6 are smaller.
- Some XHTML tags define style:
  - BOLD
  - Italic
  - Emphasis (depends on browsers, usually italic)
  - Strong (usually bold)
  - <code>Alters font for code clarity</code>
  - It is bad practice to use these, CSS is better.
- You can set text off from the rest (indent and italicize) <blockquote></blockquote>
- Special characters are shown with html entities ex. & for ampersand (&).

- The meta tag can provide search engine data. <meta name=”mysite” content=”mystuff”></meta>
- Images can be inserted using <img></img>
  - Attributes:
    - img (file path)
    - alt (alternate text if image cannot be shown).
    - Width, height, align.
- Anchor tags are used for hyperlinks.
  - LINK TEXT
- We can identify elements by the id attribute. We can also use an anchor tag to go to a particular id in a doc. (Href = #idname if in same file, filename#id for external page).
- We can use lists to display content:
  - Ordered list.
    - List items.
  - Unordered list.
  - <dl></dl> Definition list
    - <dt></dt> Definition term
    - <dd></dd> Definition definition
- Tables <table></table>
  - Header <th></th>
  - Table Data <td></td>
  - Table Row <tr></tr>
  - We can extend the size of a cell by columns or rows by adding attribute rowspan and colspan.
  - We can set the alignment of the cell content:
    - align (left,right,center) for horizontal
    - valign (top, bottom, center)
  - We can set the spacing and padding on cells:
    - cellspacing (space between cells).
    - Cellpadding (space between inner wall and content).
- Forms <form></form>
  - Action sets the script to call.
  - Method sets the HTTP method (post/get).

- Fields are all different types of <input></input>
- Buttons are input types aswell.
- Dropdown menu <select></select>
  - Each choice is <option></option>
- Text area <textarea></textarea> (specify rows and cols as attributes).

Chapter 3: Cascading Style Sheets

- CSS is used to manage and modify the style elements of a webpage.
- Method to apply:
  - Inline: <p style=”color: red;”> Top precedence.
  - Document Level: In header enclose CSS in <style type=”text/css ></style>
  - External: link a file <link rel=”stylesheet” type=”text/css” href=”mystyle.css” />
- CSS rules are applied to selectors:
  - Tag Names (all h1...)
  - We can access nested (p h1): all h1 inside p's.
  - We can group selectors h1, h2, h3 if they all have the same rule.
  - We can select a class (.className) this works nested too h1.className (all h1 with this class).
  - We can select an id (#idName), or elements inside an id #idName h1
  - Universal Selector *, applys to everything.
- Pseudo classes are used for animation on some elements:
  - a:link (CSS for unvisited links).
  - a:visited (CSS for visited links).
  - a:hover (CSS for when mouse is over link).
  - a:active (CSS for when link is selected).
- CSS properties are inherited by child nodes, but the more specific the rule, the greater precedence.
- font-family provides a list of font names in order of top choice to last resort.
- Generic fonts: serif, sans-serif, cursive, fantasy, monospace.
- font-size: numerical value or xx-small -> xx-large.
- font-style: italic, oblique or normal.

- font-weight: bolder, lighter, bold, normal or a multiple of 100
- font is a shorthand you can specify style, weight, size and font names (in this order).
- text-decoration: line-through, overline, underline, none.
- list-style-type: disc, square, circle, url (image) (list bullet).
  - For ordered lists: decimal, upper-alpha, lower-alpha, upper-roman, lower-roman
- color: hex or color name (text color)
- text-indent: value or percent (for paragraphs).
- text-align: left right center or justify.
- float: left, right, none. Text will flow around the object.
- background-color: works like color but for background.

Chapter 4: JavaScript

- To include a javascript file: <script type = “text/javascript” src=”myScript.js”></script>
- You can also embed JS straight into XHTML document:
  - <script type = “text/javascript”> <!-- CODE --> </script>
- Comments // and /**/
- Javascript has 5 primitive types: Number, String, Boolean, Undefined, and Null.
- If we try to concatenate a string and number, the number is coerced to a string.
- As long as both values are Numbers, + will add, otherwise, always concatenation.
- Comparison rules:
  - If one is a number and the other can be converted < is comparison.
  - If one is a number and the other cannot be converted, always return false.
  - If both are strings, comparison is string comparison.
- All other operators:
  - If one cannot be converted to a number, return NaN always.
- There is no Char type.
- String equality can be checked with ==.
- Double or single quotes are allowed.
- 0,-0,null, “”. false, undefined, NaN are considrered false.
- We can write to the page with document.write()
- alert() brings an alert box.

- Confirm() brings a confirm box.
- Prompt() brings a prompt box.
- == and != perform type coercion: “3” == 3, true
- === and !== do not. “3” === 3: false
- && and || are short circuit.
- Javascript only has Global variables and function scope. There is NO BLOCK LEVEL SCOPE!
- You can use a variable before its declaration, it will just be undefined.
- Best practice is to declare all variables at the beginning of the function.
- When you create an object, it has no properties, you can add properties at any time though. They are accessed by dot notation. They can also be deleted with the delete keyword.
- You can use JSON to define an object too.
- You can traverse all properties of an object:
  - for (var prop in object)...
- You can find the type of an object. MyCar instanceof car;
- Multiple ways to make arrays:
  - new Array(24, “bread”, true)
  - [24, “bread”, true];
- Multi dimensional arrays are also available.
- If there is no return value to a function, undefined is returned.
- Functions are objects.
- No type checking or parameter number checking in Javascript.
- You can pass functions as parameters.
- You can have anonymous functions var f = function (x,y) {...}
- Objects have prototypes that you can modify. This changes the template of all objects of this type.
- REGEX:
  - Patterns are encosed in //
  - Character classes: [abcd] any of these
    - [a-zA-z] Ranges are also ok.
  - In a class, if we have ^ at the beginning, it negates the set.
  - /snow./ matches any character except the new line.
  - REGEX has predefined classes:
    - \d (digits)

    - \D (not a digit)
    - \w (words: A-Za-z_0-9)
    - \W not words
    - \s (whitespace)
    - \S (not whitespace)
  - We can specify repetitions:
    - {n} exactly n repetitions
    - {m,} Atleast M repetitions
    - {m,n} Atleast M not more than N
  - Some preset specifies:
    - * 0 or more
    - + one or more
    - ? 0 or 1
  - use \ to escape special characters.
  - If you start a pattern with ^, there it is forced to match on the LEFT
  - If you end with $, it is forced to match on right.
  - You can append pattern modifiers to the end.
    - I, ignores case
    - g, global matching
    - m, multiline mode.

Lecture 5: Javascript and XHTML

- The Window object is the window in which the browser displays the document.
  - Has a document property and a frames array
- The Document Object
  - Forms array
    - Each form object has an elements array which references elements of form.
  - Anchors, links, images...
- The easiest way to access objects is by ID.
  - Document.getElementByID(“”);
- Javascript can handle events by registering event handlers to events on certain elements.

- There are two ways to register handlers:
  - Add it as an attribute to element.
  - Assign handler to property in JS.
    - Document.getElementByID(..).onclick = function name
    - Cannot use arguments in this method.
- The load event is called when the loading of a document is complete.

Chapter 6: Dynamic Documents with Javascript

- Absolute Positioning: Positioned at the coordinates related to the first parent block with positioning other than static.
- Relative Positioning: Positioned at the coordinates relative to its normal place.
- Fixed Positioning: Positioned at the coordinates relative to the browser window.
- Static Positioning: Positioned at the natural location.
- Only if the position is set to absolute or relative, the element can be moved after display.
- An element can be shown or hidden with the visibility property (visible or hidden)
- When display is set to none, other objects can take its place, this is not the case with visibility.
- When stacking items, the css value z-index determines what is in front and what is behind.
- We can delay a function call by x ms by using setTimeout(statement, miliseconds);

Chapter 9: Introduction to PHP

- Unassigned values are automatically NULL.
- Types: boolean, integer, double, string, array, object, resource, null
- Double quotes allow variables to be replaced, single quotes are literal.
- 0,0.0,””,”0”, null, and false are false values.
- The unset function sets a variable to null.
- IsSet checks if a vlue is null.
- NULL is coerced to 0 or a “” depending on context.
- If a string contains a period or E/e. It is converted to a double, else an int.
- If a string does not start with a sign or digit, zero is used.

- C style casts are also available.
- When a php script is run through the browser, the output is written to the html document.
- Echo is faster than print.
- PHP also has printf (works just like in C)
- When a string and number are compared, if the string can be converted to a number, it is, else the number is converted to a string and string comparison is used.
- Strcmp is preferred.
- Boolean operators: and, or, xor, !, &&, ||
- and and or have lower precedence than && ||
- functions don't need to be defined before calling.
- Function overloading is not supported.
- Function definitions can be nested and names are not case sensitive.
- If there is no return value, nothing is returned.
- If the caller makes too many parameteres, the extra ones are ignored.
- If there aren't enough, the missing ones are unbound.
- By default PHP uses pass by value, but you can pass reference by using & before the variable.
- If a function returns a reference, the function name must have the & before it.
- To access a non local variable it must be declared global.
- Form values are put in $_GET or $_POST depending on the method.
- A cookie is a name value pair stored on the client computer.
- setcookie(cookie_name, cookie_value, lifetime).
- Cookies must be created before all other html is created.
- Cookies are gotten through the $_COOKIE array.
- You can delete a cookie by setting the expiry to the past.
- Sessions are opened with session_start()
- Session variables are stored in $_SESSION
- We can remove some session data with unset.
- We can completely destroy a session with session_destroy()
- Open a file fopen(filename, useChar)
- Close a file fclose(fileResource)
- Write fwrite(fileResource, string)
- Read fread(fileResource, number of bytes) or fgetc(fileResource) (one char)

Chapter 7: Indroduction to XML

- XML based languages each have a set of tags and fixed rules about markup structures.
- The syntax of an XML file is stored in a DTD or XML schema.
- XML documents are regarded as having types.
- An XML document is also known as an instance or XML document instance.
- An XML document has two portions, Prolog (xml declaration), and the root element.
- An XML document has a tree structure. It must have a root node.
- An element can have attributes (just like XHTML). Attributes go in the start tag.
- XML has namespaces to prevent nameclashes.
- A namespace is specified by appending it to the beginning of the tag: <namespace::tagName>
- The XML namespace is specified using the xmlns attribute:
  - <element_name xmlns[:prefix] = URI>
- Namespaces should be defined at the root.
- DTD, Document Type Definition is a collection of declarations.
- <!keyword ...>
  - Keywords are ELEMENT, ATTLIST, ENTITY, NOTATION
  - ex <!ELEMENT memo (from, to, date, re, body)>
    - Modifiers on child elements: +,*,?
    - PCDATA is used to specify data types for leaf nodes.
    - (Parsable Character Data).
    - Data type could also be EMPTY or ANY
  - <!ATTLIST el_name at_name at_type [default]>
    - Default values: FIXED, REQUIRED, IMPLIED
  - <!ENTITY [%] entity_name “entity_value”>
    - <!ENTITY MIT “Massachusetts Institute of Technology”>
  - XML Schemas are an alternative to DTD.
    - Schemas are written using a namespace.
    - A schema has the root “schema”
      - Must specify the namespace as xmlns:xsd attribute.
    - Extension is .xsd

- XML can be displayed with CSS just as with XHTML.
- XSLT is also possible. The XSLT processor applies it.

Chapter 10: Introduction to AJAX

- The idea behind AJAX is to reload only part of the page using an asynchronous HTTP request.
- The XMLHttpRequest object is used in javascript to initiate the request.
  - Create XMLHttpRequest object.
  - Set its onreadystatechange to point to the callback function.
  - Call the open method on the object with the method and serverside script. The third boolean parameter indicates if the request is asynchronous.
    - Xhr.open(“GET”, “getCityState.php?zip=”+zip, true)
    - Get or POST can be used.
  - Make the request.
    - Xhr.send(null). (Argument is data (query string form) if POST is used).
  - The response is sent to the callback method with a print statement.
    - Var result = xhr.responseText
  - The request was successful if the object's readyState is 4 and the status is 200.
- The XMLHttpRequest is valid for all browsers except IE5 and 6.
  - For this use ActiveXObject(“Microsoft.XMLHTTP”)
  - The rest is the same.