



THE UNIVERSITY OF
WESTERN
AUSTRALIA

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SEMESTER 1, 2019 EXAMINATIONS

CITS3403

Physics, Mathematics & Computing

Agile Web Development

Department of Computer Science & Software
Engineering

This paper contains: **23 Pages (including title page)**

Time Allowed: **2:00** hours

This paper contains 10 questions, worth 5 marks each.

Candidates should attempt all questions, in the spaces provided in the question book.

The last three pages are references which may be removed from the paper.

THIS IS A CLOSED BOOK EXAMINATION

SUPPLIED STATIONERY

ALLOWABLE ITEMS

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1. (5 marks)

Define the following terms and explain their specific role in exposing a web application to a user via a web browser.

- HTML
- CSS
- Javascript
- Cookies
- HTTP requests/responses

2. (5 marks)

Given the following HTML code describe the style that is applied to the table.

```
<html>
  <head>
    <meta charset='UTF-8' />
    <style>
      table, td, th {
        border: 1px solid black;
      }

      .even {
        background-color: blue;
      }

      table td + td{
        font-style: italic;
      }

      #warning{
        background-color: red;
        font-weight:bold;
      }

      td:hover{
        border: 2px solid green;
      }
    </style>

  </head>
  <body>
    <table>
      <tr class='even'><th>A</th><th>B</th><th>C</th></tr>
      <tr><td>1</td><td>2</td><td>3</td></tr>
      <tr class='even'><td>i</td><td>ii</td><td id='warning'>iii</td></tr>
    </table>
  </body>
</html>
```


3. (5 marks)

Provide a javascript functions to transpose every table in a web page. For example, in Figure 1 we can see a table before and after it is transposed.

Mon	Tue	Wed	Thur	Fri
Bill	Joanne	David	Michelle	Agnes
Michael		Arthur	Janet	John

Mon	Bill	Michael
Tue	Joanne	
Wed	David	Arthur
Thur	Michelle	Janet
Fri	Agnes	John

Figure 1: A table before and after it is transposed.

Hint: HTML elements have an attribute called `children` that contains a collection of the children of the element.

4. (5 marks)

Explain the difference between sever side rendering of a web page with flask and client side rendering using a REST API, AJAX and jQuery. Describe the advantages and disadvantages of each approach.

5. (5 marks)

Suppose that you are writing a web application called *BucketList* where users can publish a list of things they would like to do before they die. For each user there is a list of things to do, with a checkbox indicating whether or not they have done it yet. Other users can see the list and provide a comment on the list items.

Propose a set of models to represent the data entities in this application. You do not have to present them fully in python, and you are not required to specify imports and methods. However the types of fields and relations between the models should be clear.

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6. (5 marks)

Given the *BucketList* application described in Question 5, sketch a wire-frame mock of a users page which shows their name, the items on their bucket list, and any comments other users have made.

Write a Jinja template to render the mock you have drawn. State any assumptions you require.

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7. (5 marks)

Describe the directory structure of a typical Flask project, and highlight the roles of the main files.

8. (5 marks)

Give the six key architectural constraints of the REST software architecture, and give a short description of each constraint.

9. (5 marks)

Define the following terms in the context of software testing:

- Fixtures

- Assert

- Stub

- Selenium

- Coverage

10. (5 marks)

Describe the main activities of an agile web development process, in the context of a web development project. Particularly, highlight

- (a) the different roles people have in the project,
- (b) how the application requirements are gathered and maintained,
- (c) how the project is divided into stages
- (d) how source code is shared, and
- (e) how the correct operation of the application is ensured.

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End of Paper

HTML 5 NEW TAG	
TAG NOT SUPPORTED IN HTML 5	
<!--...-->	Define a comment
<!DOCTYPE>	Defines the document type
<dd>	Defines a dropdown list
<dd>	Defines a definition description
	Defines deleted text
	Define a comment
<details>	Defines details of an element
<details>	Defines deleted text
<dialog>	Defines a dialog (conversation)
<dfn>	Defines a definition term
<dir>	Used to define a directory list
<div>	Defines a section in a document
<dl>	Defines a definition list
<dt>	Defines a definition term
	Defines emphasized text
<embed>	Defines external interactive content or plugin
<area>	Defines an area inside an image map
<article>	Defines an article
<aside>	Defines content aside from the page content
<audio>	Defines sound content
	Defines bold text
<base>	Defines a base URL for all the links in a page
<basefont>	Used to define a default font-color, font-size, or font-family for all the document
<big>	Used to make text bigger
<blockquote>	Defines a long quotation
<body>	Defines the body element
 	Inserts a single line break
<button>	Defines a push button
<canvas>	Defines graphics
<caption>	Defines a table caption
<center>	Used to center align text and content
<cite>	Defines a citation
<code>	Defines computer code text
<col>	Defines attributes for table columns
<colgroup>	Defines groups of table columns
<command>	Defines a command button

<ins>	Defines inserted text
<samp>	Defines sample computer code
<script>	Defines a generated key in a form
<section>	Defines a section
<small>	Defines keyboard text
<source>	Defines an inline sub window for, form
<select>	autofocus, challenge, disabled, form, keytype, name
	Defines a title in a fieldset
	Defines a list item value
	Defines a resource reference href, hreflang, media, rel, sizes, type
	Defines a section in a document
	Defines strong text
	Defines style definition type, media, scoped
<sup>	Defines sub/super-scripted text
<table>	Defines a table summary
<tbody>	Defines a table body summary
<td>	Defines a table cell colspan, headers, rowspan
<meta>	Defines meta information charset, content, http-equiv, name
<meter>	Defines measurement within a predefined range
<nav>	Defines navigation links high, low, max, min, optimum, value
<noframes>	Used to display text for browsers that do not handle frames
<noscript>	Defines a noscript section
<object>	Defines an embedded object data, form, height, name, type, usemap, width
	Defines an ordered list reversed, start
<optgroup>	Defines an option group label, disabled
<option>	Defines an option in a drop-down list disabled, label, selected, value
<output>	Defines some types of output for, form, name
<p>	Defines a paragraph
<param>	Defines a parameter for an object name, value
<pre>	Defines preformatted text
<progress>	Defines progress of a task of any kind max, value
<q>	Defines a short quotation alt, src, height, ismap, usemap, width
<rp>	Defines an input field accept, alt, autocomplete, autofocus, checked, disabled, form, formmethod, formnovalidate, formtarget, height, list, max, maxlen, min, multiple, name, pattern, placeholder, readonly, required, size, src, step, type, width
<rt>	Defines explanation to ruby annotations
<ruby>	Defines ruby annotations
<s>, <strike>	Used to define strikethrough text

HTML5 TAG CHEAT SHEET
Created by WebsiteSetup.org

CSS CHEAT SHEET

Shorthand*

background
border
border-bottom
border-left
border-right
border-top
font
list-style
margin
padding

Comments

/* Comment */

Pseudo Selectors

:hover
:active
:focus
:link
:visited
:first-line
:first-letter

Media Types

all
braille
embossed
handheld
print
projection
screen
speech
tty
tv

Units

Length %
em
pt
px
Keywords
bolder
lighter
larger

SYNTAX

Syntax

selector {property: value;}

External Style Sheet

```
<link rel="stylesheet" type="text/css"
      href="style.css" />
```

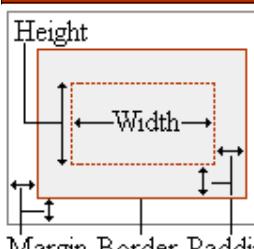
Internal Style

```
<style type="text/css">
  selector {property: value;}
</style>
```

Inline Style

```
<tag style="property: value;">
```

BOX MODEL



height; width; margin-top;
margin-right; margin-bottom;
margin-left; padding-top;
padding-right; padding-bottom;
padding-left;

GENERAL

Class	String preceded by a period
ID	String preceded by a hash mark
div	Formats structure or block of text
span	Inline formatting
color	Foreground color
cursor	Appearance of the cursor
display	block; inline; list-item; none
overflow	How content overflowing its box is handled visible, hidden, scroll, auto
visibility	visible, hidden

FONT

font-style	Italic, normal
font-variant	normal, small-caps
font-weight	bold, normal, lighter, bolder, integer (100-900)
font-size	Size of the font
font-family	Specific font(s) to be used

TEXT

letter-spacing	Space between letters
line-height	Vertical distance between baselines
text-align	Horizontal alignment
text-decoration	blink, line-through, none, overline, underline
text-indent	First line indentation
text-transform	capitalize, lowercase, uppercase
vertical-align	Vertical alignment
word-spacing	Spacing between words

BORDER

border-width	Width of the border
border-style	dashed; dotted; double; groove; inset; outset; ridge; solid; none
border-color	Color of the border

POSITION

clear	Any floating elements around the element? both, left, right, none
float	Floats to a specified side left, right, none
left	The left position of an element auto, length values (pt, in, cm, px)
top	The top position of an element auto, length values (pt, in, cm, px)
position	static, relative, absolute
z-index	Element above or below overlapping elements? auto, integer (higher numbers on top)

BACKGROUND

background-color	Background color
background-image	Background image
background-repeat	repeat, no-repeat, repeat-x, repeat-y
background-attachment	Background image scroll with the element? scroll, fixed
background-position	(x y), top, center, bottom, left, right

LIST

list-style-type	Type of bullet or numbering in the list disc; circle; square; decimal; lower-roman; upper-roman; lower-alpha; upper-alpha; none
list-style-position	Position of the bullet or number in a list inside; outside
list-style-image	Image to be used as the bullet in a list

* The properties for each selector are in the order they should appear when using shorthand notation.

Methods

Object
 toString
 toLocaleString
 valueOf
 hasOwnProperty
 isPrototypeOf
 propertyIsEnumerable

String
 charAt
 charCodeAt
 fromCharCode
 concat
 indexOf
 lastIndexOf
 localeCompare
 match
 replace
 search
 slice
 split
 substring
 substr
 toLowerCase
 toUpperCase
 toLocaleLowerCase
 toLocaleUpperCase

RegEx
 test
 match
 exec

Array
 concat
 join
 push
 pop
 reverse
 shift
 slice
 sort
 splice
 unshift

Number
 toFixed
 toExponential
 toPrecision

Date
 parse
 toDateString
 toTimeString
 getDate
 getDay
 getFullYear
 getHours
 getMilliseconds
 getMinutes
 getMonth
 getSeconds
 getTime
 getTimezoneOffset
 getYear
 setDate
 setHours
 setMilliseconds
 setMinutes
 setMonth
 setSeconds
 setYear
 toLocaleTimeString

JavaScript

XMLHttpRequest

Safari, Mozilla, Opera:
`var req = new XMLHttpRequest();`

Internet Explorer:
`var req = new ActiveXObject("Microsoft.XMLHTTP");`

XMLHttpRequest Object Methods

abort()
 getAllResponseHeaders()
 getResponseHeader(header)
 open(method, URL)
 send(body)
 setRequestHeader(header, value)

XMLHttpRequest Object Properties

onreadystatechange
 readyState
 responseText
 responseXML
 status
 statusText

XMLHttpRequest readyState Values

0 Uninitiated
 1 Loading
 2 Loaded
 3 Interactive
 4 Complete

JAVASCRIPT IN HTML

External JavaScript File
`<script type="text/javascript" src="javascript.js"></script>`

Inline JavaScript
`<script type="text/javascript">
 <!--
 // JavaScript Here
 -->
</script>`

Functions

Window	Built In
alert	eval
blur	parseInt
clearTimeout	parseFloat
close	isNaN
focus	isFinite
open	decodeURI
print	decodeURIComponent
setTimeout	encodeURI
	encodeURIComponent
	escape
	unescape

REGULAR EXPRESSIONS - FORMAT

Regular expressions in JavaScript take the form:
`var RegEx = /pattern/modifiers;`

REGULAR EXPRESSIONS - MODIFIERS

/g	Global matching
/i	Case insensitive
/s	Single line mode
/m	Multi line mode

REGULAR EXPRESSIONS - PATTERNS

^	Start of string
\$	End of string
.	Any single character
(a b)	a or b
(...)	Group section
[abc]	Item in range (a or b or c)
[^abc]	Not in range (not a or b or c)
a?	Zero or one of a
a*	Zero or more of a
a+	One or more of a
a{3}	Exactly 3 of a
a{3,}	3 or more of a
a{3,6}	Between 3 and 6 of a
!(pattern)	"Not" prefix. Apply rule when URL does not match pattern.

EVENT HANDLERS

onAbort	onMouseDown
onBlur	onMouseMove
onChange	onMouseOut
onClick	onMouseOver
onDblClick	onMouseUp
onDragDrop	onMove
onError	onReset
onFocus	onResize
onKeyDown	onSelect
onKeyPress	onSubmit
onKeyUp	onUnload
onLoad	

FUNCTIONS AND METHODS

A method is a type of function, associated with an object. A normal function is not associated with an object.

Available free from
AddedBytes.com

DOM Methods

Document
 clear
 createDocument
 createDocumentFragment
 createElement
 createEvent
 createEventObject
 createRange
 createTextNode
 getElementsByTagName
 getElementById
 write

Node
 addEventListener
 appendChild
 attachEvent
 cloneNode
 createTextRange
 detachEvent
 dispatchEvent
 fireEvent
 getAttributeNS
 getAttributeNode
 hasChildNodes
 hasAttribute
 hasAttributes
 insertBefore
 removeChild
 removeEventListener
 replaceChild
 scrollIntoView

Form
 submit

DOM Collections
 item

Range
 collapse
 createContextualFragment
 moveEnd
 moveStart
 parentElement
 select
 setStartBefore

Style
 getProperty
 setProperty

Event
 initEvent
 preventDefault
 stopPropagation

XMLSerializer
 serializeToString

XMLHTTP
 open
 send

XMDOM
 loadXML

DOMParser
 parseFromString