THE UNIVERSITY OF
WESTERN
AUSTRALIA

Computer Science & Software Engineering

SEMESTER 1, 2017 EXAMINATIONS

CITS3403
Agile Web Development

FAMILY NAME: ____________________________ GIVEN NAMES: ______________________

STUDENT ID: | | | | | | | | | SIGNATURE: ________________________

This Paper Contains: **18** pages **(including title page)**
Time allowed: **2:00 hours**

There are 10 questions, each worth 5 marks.

TOTAL MARKS: 50 marks

Candidates must attempt ALL questions. The questions should be answered in the space provided in this examination paper.

Calculators are not permitted.

PLEASE NOTE

Examination candidates may only bring authorised materials into the examination room. If a supervisor finds, during the examination, that you have unauthorised material, in whatever form, in the vicinity of your desk or on your person, whether in the examination room or the toilets or en route to/from the toilets, the matter will be reported to the head of school and disciplinary action will normally be taken against you. This action may result in your being deprived of any credit for this examination or even, in some cases, for the whole unit. This will apply regardless of whether the material has been used at the time it is found.

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Supervisors Only - Student left at:

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1. (5 marks)

Suppose you visit the web page `http://MyToDo.com/`. You see a page with some general information, and a form to enter your email and password. You enter your email and password, which takes you to `http://MyToDo.com/178993/` and then you see a list of the 'to-do' items you had previously entered. Assuming the MyToDo.com is implemented using a MEAN stack with server side rendering, describe the processes involved in creating and serving these two pages.

2. (5 marks)

Describe three different methods to apply a style to elements in an HTML webpage and give an example of each.

Explain the advantages and disadvantages of each approach.

3. (5 marks)

Expand and define the following acronyms:

- DOM
- JSON
- CRUD
- CSS
- REST

4. (5 marks)

Consider the following HTML and javascript code and answer the questions on the following page:

```
<html>
<head>
<script>
var mp = {' him ':' them ',' her ':' them ',' he ': ' they ',
          ' she ':' they ',' his ': ' their ', ' her ':' their '}

function subs(obj){
  return function(str){
    var props = Object.keys(obj);
    for(var i =  0; i<props.length; i++){
      var pattern = new RegExp(props[i],'ig');
      str = str.replace(pattern, obj[props[i]]);
    }
    return str;
  };
}

function update(){
  var elems = document.getElementsByTagName('*');
  var f = subs(mp);
  for(var i = 0; i<elems.length; i++){
    elems[i].innerHTML = f(elems[i].innerHTML);
  }
}
</script>
</head>
<body onload='update()'>
<h1> He Mourned His Master, Henry Lawson, 1890</h1>

The theme is ancient as the hills,<br>
With all their prehistoric glory;<br>
But yet of Corney and his friend,<br>
We've often longed to tell the story;<br>
And should we jar the reader's ear,<br>
Or fail to please his eye observant,<br>
We only trust that he'll forgive<br>
The bush muse and, your humble servant... <br>
</body>
```

(a) What is the effect of the function `update()`?

(b) What does the function `subs` return?

(c) Can you identify any errors or problems or limitations with the function as implemented?

5. (5 marks)

Describe the DOM2 event listener model, and explain how event flow works.

6. (5 marks)

Explain the purpose of the following files and directories in a typical Express project:

- `app.js`

- `package.json`

- `views` directory

- `public` directory

- `routes`

7. (5 marks)

Describe how the four standard HTTP verbs are interpretted in a RESTful API for both collections and individual elements.

8. (5 marks)

MovieMate.com is a site that matches people with other people who like similar movies and suggests possible movies they may wish to attend together. For each user, MovieMate records a name, email address, postcode, and a list of movies they have seen. Each movie has a title, year of release, genre, and the users personal rating (1-5 stars) of that movie.

Specify a set of mongoose schemas to describe the necessary models for this data.

9. (5 marks)

Given the MovieMate.com scenario described in the previous question, use either Pug(Jade) or embedded javascript to write a view that takes a javascript object corresponding to a MovieMate.com user. The page should display the user's name and then list the names of movies they have rated, along with the number of stars they gave the movie.

You may assume that there is a javascript object provided with properties `name` and `movies`. There is also an image file `star.jpg` you can use to draw the star rating.

10. (5 marks)

Explain the difference between a single page application and a web application that uses server side rendering. What are the advantages and disadvantages of each.

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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
	<a>	Defines a hyperlink href, hreflang, media, ping , rel, target, type
	<abbr>	Defines an abbreviation
	<acronym>	Used to define an embedded acronyms
	<address>	Defines an address element
	<applet>	Used to define an embedded applet
	<area>	Defines an area inside an image map alt, coords, href, hreflang, media, ping, rel, shape, target, type
■	<article>	Defines an article cite, pubdate
■	<aside>	Defines content aside from the page content
■	<audio>	Defines sound content autobuffer, autoplay, controls, src
	<b>	Defines bold text
	<base>	Defines a base URL for all the links in a page href, target
	<basefont>	Used to define a default font-color, font-size, or font-family for all the document
	<bdo>	Defines the direction of text display dir
	<big>	Used to make text bigger
	<blockquote>	Defines a long quotation cite
	<body>	Defines the body element
	<br>	Inserts a single line break
	<button>	Defines a push button autofocus, disabled, form, formaction, formenctype, formmethod, formnovalidate, formtarget, name, type, value
■	<canvas>	Defines graphics height, width
	<caption>	Defines a table caption
	<center>	Used to center align text and content
	<cite>	Defines a citation
	<code>	Defines computer code text autobuffer, autoplay, controls, src
	<col>	Defines attributes for table columns
	<colgroup>	Defines groups of table columns span
■	<command>	Defines a command button checked, disabled, icon, label, radiogroup, type

■	<datalist>	Defines a dropdown list
	<dd>	Defines a definition description
	<del>	Defines deleted text cite, datetime
■	<details>	Defines details of an element open
■	<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
	<em>	Defines emphasized text
	<embed>	Defines external interactive content or plugin height, src, type, width
	<fieldset>	Defines a fieldset disabled, form, name
■	<figure>	Defines a group of media content, and their caption
	<font>	Used to define font face, font size, and font color of text
■	<footer>	Defines a footer for a section or page
	<form>	Defines a form accept-charset, action, autocomplete, enctype, method, name, novalidate, target
	<frame>	Used to define one particular window (frame) within a frameset
	<frameset>	Used to define a frameset, which organized multiple windows (frames)
	<h1> to <h6>	Defines header 1 to header 6
	<head>	Defines information about the document
■	<header>	Defines a header for a section or page
■	<hgroup>	Defines information about a section in a document
	<hr>	Defines a horizontal rule
	<html>	Defines an html document manifest, xmlns
	<i>	Defines italic text
	<iframe>	Defines an inline sub window height, name, sandbox, seamless, src, width
	<img>	Defines an image alt, src, height, ismap, usemap, width
	<input>	Defines an input field accept, alt, autocomplete, autofocus, checked, disabled, form, formaction, formenctype, formmethod, formnovalidate, formtarget, height, list, max, maxlength, min, multiple, name, pattern, placeholder, readonly, required, size, src, step, type, value, width

	<ins>	Defines inserted text cite, datetime
■	<keygen>	Defines a generated key in a form autofocus, challenge, disabled, form, keytype, name
	<kbd>	Defines keyboard text
	<label>	Defines an inline sub window for, form
	<legend>	Defines a title in a fieldset
	<li>	Defines a list item value
	<link>	Defines a resource reference href, hreflang, media, rel, sizes, type
	<map>	Defines an image map name
■	<mark>	Defines marked text
	<menu>	Defines a menu list label, type
	<meta>	Defines meta information charset, content, http-equiv, name
■	<meter>	Defines measurement within a predefined range high, low, max, min, optimum, value
■	<nav>	Defines navigation links
	<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
	<ol>	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 cite
■	<rp>	Used in ruby annotations to define what to show browsers that to not support the ruby element
	<rt>	Defines explanation to ruby annotations
	<ruby>	Defines ruby annotations
	<s>, <strike>	Used to define strikethrough text.

	<samp>	Defines sample computer code
	<script>	Defines a definition list async, type charset defer, src
■	<section>	Defines a section cite
	<select>	Defines a selectable list autofocus, disabled, form, multiple, name, size
	<small>	Defines small text
■	<source>	Defines media resources media, src, type
	<span>	Defines a section in a document
	<strong>	Defines strong text
	<style>	Defines a style definition type, media, scoped
	<sub>, <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
	<textarea>	Defines a text area autofocus, cols, disabled, form, maxlength, name, placeholder, readonly, readonly, required, rows, wrap
	<tfoot>, <thead>	Defines a table footer / head
	<th>	Defines a table header colspan, headers, rowspan, scope
	<time>	Defines a date/tim datetime
	<title>	Defines the document title
	<tr>	Defines a table row datetime
	<tt>	Used to define teletype text
	<u>	Used to define underlined text
	<ul>	Defines an unordered list
	<var>	Defines a variable
■	<video>	Defines a video autobuffer, autoplay, controls, height, loop, src, width

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">

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

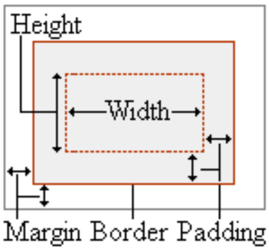
FONT

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

BOX MODEL



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

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.

JavaScript

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

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
alert
blur
clearTimeout
close
focus
open
print
setTimeout

Built In
eval
parseInt
parseFloat
isNaN
isFinite
decodeURI
decodeURIComponent
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
onBlur
onChange
onClick
onDblClick
onDragDrop
onError
onFocus
onKeyDown
onKeyPress
onKeyUp
onLoad
onMouseDown
onMouseMove
onMouseOut
onMouseOver
onMouseUp
onMove
onReset
onResize
onSelect
onSubmit
onUnload

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
getPropertyValue
setProperty

Event
initEvent
preventDefault
stopPropagation

XMLSerializer
serializeToString

XMLHTTP
open
send

XMLDOM
loadXML

DOMParser
parseFromString