COMM049/7/Semr 1 2014/2015

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UNIVERSITY OF SURREY

Faculty of Engineering & Physical Sciences

Department of Computing

Undergraduate Programmes in Computing

Module COMM049; 15 Credits

HTML5 and CSS3 for Mobile Applications

FHEQ Level 7 (MSc) Examination

Time allowed: Two hours

Semester 1 2014/2015

Answer all three questions

Each question carries 33 marks.

Where appropriate the mark carried by an individual part of a question is indicated in square brackets [ ].
Approved calculators allowed

SOLUTIONS

1: The course argues that with recent developments in HTML5 and CSS3, there is no need to use native code for mobile applications. Instead, a single application should be developed for the web in the large, taking into account that it may be viewed from one of a range of devices (TV, desktop, laptop, tablet, smartphone, …). Discuss in detail and comprehensively whether you think this is a fair assessment, using examples from the features that have been presented in the course.

[33 marks]

Ans: The response should include discussion of:
Off-line working
Local storage, session storage, in-browser databases;
The geolocation API;
Media queries;
HTML5 Column property;
Flexbox;
CSS3 animations;
SVG for scalable graphics;
HTML5 Audio and Video
HTML5 canvases
Up to [3 marks] for each point, plus [3 marks] for overall argument.

Total [33 marks]

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2: This question covers a range of general aspects of developing web applications.

(a) Which answer best categorises a JavaScript (JS) array? (Write down your answer in the answer book.)

(i) A variable
(ii) An object
(iii) A method
(iv) A function [1 mark]

Ans: It is an object. [1 mark]

(b): External JS scripts can be linked into more than one page. True or false? [1 mark]

Ans: True of course! [1 mark]

(c): External JS scripts must include the <script> tag. True or false? [1 mark]

Ans: false [1 mark]

(d): Provide a one sentence succinct answer to the question of: "What is HTML5 for?" [1 mark]

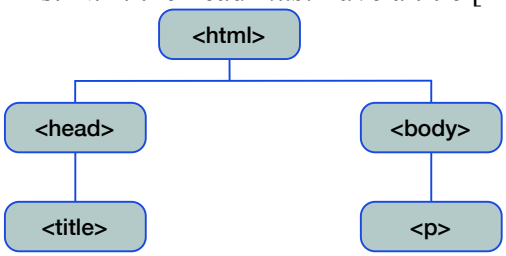
Ans: HTML5 is used to describe the content of a document. [1 mark]

(e). An HTML element has three components. What are they? Illustrate your answer with an example and identify the components by name. [3 marks]

Ans: e.g. start tag -> <h1>This is the answer (content)</h1> <- end tag

(f). Draw out a valid DOM tree for the simplest possible valid HTML5 document, with a <body> containing just one paragraph element. [4 marks]

Ans: N.B. the head *must* have a title [4 marks]



(g). The course recommends specifying "UTF-8" as the character encoding that is used in an HTML document.
(i) Why is it important to specify the character encoding? [3 marks]

Early web pages just used the ASCII character set [1 marks]. But the web is global and more characters are needed than is supported by plain ASCII [1 marks]. As a result we need to declare how the characters in a document have been encoded in order for a browser to interpret it as intended [1 marks]

(ii) What is the significance of "UTF-8"? [2 marks]
Ans: UTF-8 is a Unicode character encoding. Hence it supports characters from most known written languages, plus many other special characters. [2 marks]

(iii) Why do you think it should be important to specify the character encoding as early as possible in an HTML document? [1 mark]
Ans: If the browser sees this late, it may need to stop interpreting the document at that point and go back and start all over. [1 mark]

(h). Use of the <i> and <b> elements were discouraged in HTML 4.01. However, they are now back in HTML5. What are the HTML5 semantics of <i> and <b>, respectively? [4 marks]

Ans: <i> should be used to indicate a span of text that is offset from the normal prose. [2 marks]
<b> should be used to indicate a span of text that is stylistically offset from the normal prose. [2 marks]

(i). Look at the HTML in figure 1 (*overleaf*). The intention is that there be a single entry point into the document outline (the with id="header").
(i) Why is there a problem with this HTML 4 style of syntax? [2 marks]
(ii) Using the HTML5 semantic elements <header> and <article>, rewrite the html without the use of elements to retain all the level 1 headings, but have a document outline with a single entry point. [4 marks]
(iii) Explain why this works now. [2 marks]

Ans:
(i) HTML 4 only allows one level 1 heading per document to act as the root of a document outline. If additional h1 ones are present they will be interpreted as siblings with ambiguity about the root. [2 marks]
(ii) [4 marks] for a response as per:

```
<body>
  <header>
    <h1>I <em>think</em> this is the root</h1>
  </header>
  <article>
    <h1>Who are my siblings?</h1>
  </article>
  <article>
    <h1>Am I my brother's keeper?</h1>
  </article>
</body>
```

(iii) In this case the <header> element is identified as the entry point. The semantic elements <header> and <article> can then have their own sub-trees. [2 marks]

QUESTION CONTINUED ON NEXT PAGE

```
<body>
  <div id="header">
    <h1>I <em>think</em> this is the root</h1>
  </div>
  <div class="entry">
    <h1>Who are my siblings?</h1>
  </div>
  <div class="entry">
    <h1>Am I my brother's keeper?</h1>
  </div>
</body>
```

Figure 1.

(j). Identify four best practices that the course recommends for improving accessibility of a web site. [4 marks]

Ans: Select from: use of HTML5 semantic elements; use of ARIA codes; ensure all web pages have a descriptive title; use breadcrumb trails; specify tab indices to assist navigation; provide a site map; help link; search function.
[1 mark] for each correct best practise.

Total [33 marks]

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3: This question covers a range of aspects of developing with jQuery.

(a) Which of the following statements are true:
(i) jQuery is a JSON Library;
(ii) jQuery is a JavaScript library

[2 marks]

Ans: (ii)

(b) Which well-known syntax is jQuery's method of selecting DOM elements based on?

[2 marks]

Ans: CSS Selectors'

(c) What sign does jQuery use as a shortcut for jQuery?

[1 mark]

Ans: "$"

(d) What does the selector `$("div")` select in jQuery?
(i) All `div` elements
(ii) The first `div` element [2 marks]

Ans: All div elements

(e) What is the correct jQuery code to set the background colour of all `p` elements to red?
(i) `$("p").style("background-color","red");`
(ii) `$("p").change("background-color","red");`
(iii) `$("p").css("background-color","red");`
(iv) `$("p").layout("background-color","red");`

[2 marks]

Ans: (iii)

(f) Which jQuery method is used to hide selected elements?
(i) `display(none)`
(ii) `visible(false)`
(iii) `hidden()`
(iv) `hide()`

[2 marks]

Ans: (iv)

(g) Which jQuery method is used to perform an asynchronous http request?
(i) `jQuery.ajaxAsync()`
(ii) `jQuery.ajaxSetup()`
(iii) `jQuery.get()`
(iv) `jQuery.ajax()`

[2 marks]

Ans: (iv)

(h) What is the correct code for making all div elements 100pixels high?
(i) `$("div").height = "100"`
(ii) `$("div").style(height=100)`
(iii) `$("div").height(100)`

(iv) `$("div").yPos(100)` [2 marks]

Ans: (iii)

QUESTION 3 CONTINUES ON THE NEXT PAGE

(i) Consider the static HTML of Figure 1. Suppose that you now import the JavaScript of Figure 2 into the same HTML document.

(i) Describe from the user's perspective the dynamic behaviour that is now associated with the document (i.e. what the user will see). [5 marks]

(ii) Explain from a technical perspective how the code in Figure 2 creates the behaviour described in part (i) above. [10 marks]

(iii) Modify the JavaScript code so that the click function only applies to the paragraph of class "bear" [3 marks]

```
<body>
   <h1 id="myTitle">Some jQuery examples</h1>
   <p id="myParentDiv">The fun starts here:</p>
   <p>And ends here!</p>
</body>
```

Figure 1

```
<script src="jquery-1.8.2.min.js"></script>
<script>
  $(function(){
    $('#myTitle')
    .bind('mouseover', function(event){
      $("<p class='bear'>I have a bear!</p>
         <p>I don't</p>")
         .click(function(){
                  alert("I'm a bear!");
              }).end().appendTo("#myParentDiv");
  })
 })
</script>
```

Figure 2

(i) When the use mouses over the myTitle element, two new paragraphs will appear beneath the "myParentDiv". When subsequently clicking on either paragraph, the alert will appear. [5 marks]

(ii) $(function()) ensures the JavaScript is loaded as soon as the document is ready. [2 marks]
$(myTitle) addresses the myTitle element [2 marks]. We then bind a function to the mousover event on myTitle [2 marks]. This function creates the two new paragraphs and appends them to myParentDiv [2

marks]. We then bind the function that raises the alert to a click event to the new elements. [2 marks]

(iii) We need to filter the new elements as follows (change in bold):

```
<script src="jquery-1.8.2.min.js"></script>
<script>
  $(function(){
    $('#myTitle')
    .bind('mouseover', function(event){
      $("<p class='bear'>I have a bear!</p>
         <p>I don't</p>")
      .filter(".bear").click(function(){
                  alert("I'm a bear!");
              }).end().appendTo("#myParentDiv");
  })
 })
</script>
```

[3 marks]

Total [33 marks]

END OF PAPER

INTERNAL EXAMINER: Prof. Paul Krause
EXTERNAL EXAMINER: Prof. Mahesan Niranjan