Name and initials:	Course: Web Technology
Student nr:	Date: 29 January 2016

The exam consists of 100 closed questions. Each question consists of a statement of which you need to state whether it is TRUE or FALSE by checking the corresponding box. The questions are grouped by topic and in some cases a small introductory text is provided. We assume one can get 50 correct answers by pure chance, so you will receive 0.2 point for every additional correct answer.

Remember to save the document regularly (Ctrl-S). Do not change the filename or location of the document and do not close the PC. At the end, check that you answered all the questions. Then save the document again and close the PDF viewer.

1 History and organization of the Web

1a. TRUE ◯ FALSE ◯ : The Internet Protocol originates from the early nineties

1b. TRUE ◯ FALSE ◯ : The DNS (Domain Name Service) existed before the Web was invented

1c. TRUE ◯ FALSE ◯ : SMTP and DNS are technologies developed by Tim Berners-Lee

1d. TRUE ◯ FALSE ◯ : The notion of "hypertext", text with links, existed before the Web was invented

2 Internet Protocol

2a. TRUE ◯ FALSE ◯ : IPv6 (Internet Protocol version 6) is the successor of IPv4.

2b. TRUE ◯ FALSE ◯ : The IPv4 address space can encode 2^{32} addresses, while IPv6 can encode 2^{128} addresses.

2c. TRUE ◯ FALSE ◯ : 201.64.109.1 is a valid IPv4 address.

2d. TRUE ◯ FALSE ◯ : The Internet Protocol originates from the early nineties.

3 Development of the Web

3a. TRUE ◯ FALSE ◯ : The World Wide Web was originally invented by the US military.

3b. TRUE ◯ FALSE ◯ : Part of the success of the initial Web can be explained by its simplicity: HTML was easy to learn by studying examples found on the Web.

3c. TRUE ◯ FALSE ◯ : The WHATWG (Web Hypertext Application Technology Working Group) sees the HTML specification as a "Living Standard" that needs continuous maintenance as the language evolves.

3d. TRUE ◯ FALSE ◯ : To implement the patented HTML5 specification, browser developers need to buy a license from WHATWG.

4 Web Markup: HTML5

4a. TRUE ◯ FALSE ◯ : HTML5 provides more semantic markup tags than earlier versions of HTML.

4b. TRUE ◯ FALSE ◯ : HTML5 is more strict about syntax details than earlier versions of HTML.

4c. TRUE ◯ FALSE ◯ : The `nav` element is an example of semantic markup introduced in HTML5.

4d. TRUE ◯ FALSE ◯ : A `div` element cannot have a `class` attribute when used as semantic markup.

4e. TRUE ◯ FALSE ◯ : The new `title` element replaces the old `h1` elements.

4f. TRUE ◯ FALSE ◯ : The `article` element is an alternative for the `title` element.

4g. TRUE ◯ FALSE ◯ : Browsers normalize extra spaces when displaying an HTML file.

4h. TRUE ◯ FALSE ◯ : The `section` element is used to specify a header for a document or section.

5 Web Markup: CSS

5a. TRUE ◯ FALSE ◯ : CSS3 `media` queries are used to write styles rules that adapt the rendering of HTML to a wide variety of devices.

5b. TRUE ◯ FALSE ◯ : The selector `p.note` indicates that the style rule should be applied to all `p` elements that have an `id` attribute with the value `"note"`.

5c. TRUE ◯ FALSE ◯ : `p {font-weight :bold;}` is a correct CSS style rule for making all the `<p>` elements bold.

5d. TRUE ◯ FALSE ◯ : `page-break-after` is a CSS property intended for screen media usage.

5e. TRUE ◯ FALSE ◯ : To refer to a CSS style sheet embedded in an HTML document you can use `<style src="mystyle.css">`.

6 Information Retrieval

Consider the following situation: Piet wants to have information about training puppies. He enters the search query "Puppy training" in a web search engine. The search engine retrieves three pages. Two of them are about puppy training. One is about a train of puppies. Piet considers the first two pages correct and the third incorrect. Determine whether the following statements are true or false.

6a. TRUE ◯ FALSE ◯ : The string "Puppy training" is the information need of Piet.

6b. TRUE ◯ FALSE ◯ : The recall of the result is 3.

6c. TRUE ◯ FALSE ◯ : The precision at 2 (P@2) is 1.0

6d. TRUE ◯ FALSE ◯ : Relevancy is independent of Piet's subjective judgment

6e. TRUE ◯ FALSE ◯ : The search query is a transactional query

7 Information Laws on the Web

7a. TRUE ◯ FALSE ◯ : The average shortest path between two arbitrary sites on the Web is relatively small, this is mainly because of a few big sites that connect many other sites.

7b. TRUE ◯ FALSE ◯ : `tf.idf` ranks a document higher if it contains a search term that occurs in many documents in the entire document collection.

7c. TRUE ◯ FALSE ◯ : Heaps' law predicts that if you index many documents, you will have quickly encountered all unique words in the collection.

7d. TRUE ◯ FALSE ◯ : Zipf's law describes that a linear frequency distribution of words on the Web.

8 Client-side Scripting: Javascript

8a. TRUE ◯ FALSE ◯ : Using JavaScript host objects, you can close the browser window.

8b. TRUE ◯ FALSE ◯ : JavaScript has no "print" or "echo" statements as part of the language.

8c. TRUE ◯ FALSE ◯ : The external JavaScript file must contain the `<script>` tag.

8d. TRUE ◯ FALSE ◯ : With JavaScript and the DOM API, you can replace the `src` attribute of an `img` element in response to a mouse click.

8e. TRUE ◯ FALSE ◯ : With JavaScript and the DOM API, you can remove a `p` element after the document has been loaded into the browser.

8f. TRUE ◯ FALSE ◯ : The Document Object Model (DOM) models a document as a tree data structure.

8g. TRUE ◯ FALSE ◯ : The DOM API can be used in JavaScript, but not in other programming languages.

8h. TRUE ◯ FALSE ◯ : An event handler is a function that is called in response of a specific event (for example, a mouse click).

8i. TRUE ◯ FALSE ◯ : To change the content of the HTML element `<p id="demo">Anyone there?</p>`, you can use the Javascript line: `document.getElementById("p").innerHTML = "Hello World!";`

9 AJAX

9a. TRUE ◯ FALSE ◯ : With AJAX technology, you can replace parts of the page without refreshing the entire page.

9b. TRUE ◯ FALSE ◯ : AJAX technology makes inaccessible sites accessible.

9c. TRUE ◯ FALSE ◯ : Websites no longer need to use JavaScript if they upgrade to AJAX.

9d. TRUE ◯ FALSE ◯ : Websites no longer need to use CSS if they stop using AJAX.

9e. TRUE ◯ FALSE ◯ : An HTTP server responding to an AJAX request must respond by serving an HTML representation of any requested resource.

9f. TRUE ◯ FALSE ◯ : An HTTP server needs to allow every AJAX request, even if the JavaScript initiating the request originates from another server.

9g. TRUE ◯ FALSE ◯ : If the HTTP server is designed to be used by an AJAX client, it should never respond to HTTP POST requests.

9h. TRUE ◯ FALSE ◯ : A drawback of AJAX is that HTTP servers can no longer use the common HTTP response codes.

10 HTTP and REST

10a. TRUE ◯ FALSE ◯ : The HTTP request method *must* be either `GET`, `POST` or `DELETE`.

10b. TRUE ◯ FALSE ◯ : HTTP response codes starting with "3" indicate a server-side error.

10c. TRUE ◯ FALSE ◯ : HTTP requests are sent by the client, HTTP responses by the server.

10d. TRUE ◯ FALSE ◯ : HTTP is a "stateless" network protocol.

10e. TRUE ◯ FALSE ◯ : To be able to successfully perform an operation on a Web resource, a Web client and server need to agree on the URL to access the resource.

10f. TRUE ◯ FALSE ◯ : To be able to successfully perform an operation on a Web resource, a Web client and server need to agree on the HTTP method(s) allowed on the resource

10g. TRUE ◯ FALSE ◯ : To be able to successfully perform an operation on a Web resource, a Web client and server need to agree on whether the server will generate the resource dynamically or not.

10h. TRUE ◯ FALSE ◯ : To be able to successfully perform an operation on a Web resource, a Web client and server need to agree on the acceptable representation formats of the resource.

10i. TRUE ◯ FALSE ◯ : Cross-origin resource sharing (CORS) is a mechanism to allow restricted resources on a web server to be requested by scripts on pages from another domain.

11 HTTP Cookies

11a. TRUE ◯ FALSE ◯ : Cookies can be used to adapt sites to the personal preferences of the user.

11b. TRUE ◯ FALSE ◯ : Cookies are a frequent source of trojan horses.

11c. TRUE ◯ FALSE ◯ : Cookies were introduced in HTML5.

11d. TRUE ◯ FALSE ◯ : Cookies can be used to pass on private and sensitive information.

12 Web Accessibility

12a. TRUE ◯ FALSE ◯ : A Web document that has been successfully validated by the W3C HTML en CSS validator also conforms to the W3C accessibility guidelines.

12b. TRUE ◯ FALSE ◯ : Appropriate use of the `alt` attribute improves the accessibility of video, audio and image content.

12c. TRUE ◯ FALSE ◯ : W3C's Web Content Accessibility Guidelines (WCAG) 2.0 provides five levels of conformance (A-E).

12d. TRUE ◯ FALSE ◯ : If your website is navigable with a standard (QWERTY) keyboard, it conforms to the W3C accessibility guidelines.

12e. TRUE ◯ FALSE ◯ : The availability of a text-only version of a Web page is sufficient for accessibility.

12f. TRUE ◯ FALSE ◯ : Semantic markup facilitates access of Web content using special accessibility devices, such as screen readers.

13 Web Evaluation

13a. TRUE ◯ FALSE ◯ : The goal of A/B testing is to analyze the difference in behaviour on a web page for two different user groups (for example male/female users)

13b. TRUE ◯ FALSE ◯ : HTTP log files are typically stored client-side.

13c. TRUE ◯ FALSE ◯ : You can make a "low-fidelity mockup" with pen and paper.

13d. TRUE ◯ FALSE ◯ : A web site owner hypothesizes that more than 80% of his visitors click the first link on his page and analyzes user logs to test this. In this experiment the independent variable is the link clicked.

13e. TRUE ◯ FALSE ◯ : In the above scenario, the dependent variable is the number of visitors.

14 Web Science, Net Neutrality and Linked Open Data

14a. TRUE ◯ FALSE ◯ : Web Science does concern itself only with the social aspects of the Web and not with the technical aspects.

14b. TRUE ◯ FALSE ◯ : Legal issues on the Web are often extra difficult due to lack of "location".

14c. TRUE ◯ FALSE ◯ : Scale free networks (such as the Web) typically have one clearly identified central node.

14d. TRUE ◯ FALSE ◯ : Scale-free networks have few nodes that have many links and many nodes that have few links.

14e. TRUE ◯ FALSE ◯ : All data available on the Web is by definition Open Data.

14f. TRUE ◯ FALSE ◯ : Net neutrality implies that the Internet should be free of regulations and political interference.

14g. TRUE ◯ FALSE ◯ : Net neutrality implies that it is illegal to provide lower quality of service (e.g. bandwith) for a lower subscription fee.

14h. TRUE ◯ FALSE ◯ : The Resource Description Framework (RDF) is W3C standard for interchanging data on the Web.

14i. TRUE ◯ FALSE ◯ : By representing your data in RDF, you adhere to the "five stars of Linked Data".

15 HTML5 code fragment

Study the HTML5 source code below. This code contains errors and correct parts. For each of the next statements, determine whether the statement made is true or false.

15a. TRUE ◯ FALSE ◯ : line 5 is not valid: `<a>` is not allowed in `title`.

15b. TRUE ◯ FALSE ◯ : in line 7, the `header` selector correctly selects the first level heading.

15c. TRUE ◯ FALSE ◯ : line 15: Using absolute pixel size for body is considered bad practice (accessibility).

15d. TRUE ◯ FALSE ◯ : line 23 contains style markup that is better replaced by semantic markup.

15e. TRUE ◯ FALSE ◯ : line 23 is valid (there are no HTML5 syntax errors in it).

15f. TRUE ◯ FALSE ◯ : line 31 is correct (there are no errors in it).

15g. TRUE ◯ FALSE ◯ : line 27: there is a hash # missing in the `href` (should be `href=''#myform''`).

15h. TRUE ◯ FALSE ◯ : line 29: the HTTP method used on submission in the `method` cannot be `HEAD` (should be `POST`).

15i. TRUE ◯ FALSE ◯ : The character encoding of this document is defined.

15j. TRUE ◯ FALSE ◯ : All `<p>` elements are used correctly.

15k. TRUE ◯ FALSE ◯ : The footer is placed correctly.

HTML5 source

```
<!DOCTYPE html>
<html>
<head>
  <title>WT - Assignment <a href="lab1.html"> 1 </a> </title>
  <style>
      body {background-color: #FFFFFF;}
      header { <!-- this is for the first level heading -->
            font-weight: bold;
            font-size: 40pt;}
  </style>
 </head>

<body style="width: 1024px; height: 768px;" >

 <!-- this is the first level heading -->
 <nav class="header" style="font-size: 3em; font-weight: bold;">
   Web Technology Assignment 1: Markup
 </nav>

 <section>
 <p style="font-size: 0.8em">
  The purpose of <strong>assignment 1</strong> is to test whether
  each <span style="font-weight: bold;">group</span>
  has grasped the key concepts of Web markup at a sufficient level.
 </p>

<p><a href="myform">See the form below</a> for an example:

<form id="myform" method="HEAD" action="http://wt.ops.few.vu.nl/">
   <input type="text">Category</input>
   <input type="date">Expired</input>
</form>

   <footer>Copyright: VU University Amsterdam</footer>
  </body>
 </section>
</html>
```

16 Server log analysis

Study the fragment from the HTTP server log on the below (Common Log Format).

```
1 221.16.196.17 - - [29/Jan/2016:15:15:00 +0100] "GET / HTTP/1.1" 200 2326
2 221.16.196.17 - - [29/Jan/2015:15:15:11 +0100] "GET /training/ HTTP/1.1" 200 4391
3 221.16.196.17 - - [29/Jan/2015:15:15:21 +0100] "GET /training/searchloc.php?query=Haarlem HTTP/1.1" 200 3431
4 187.12.176.11 - - [29/Jan/2015:15:15:29 +0100] "GET / HTTP/1.1" 200 2326
5 221.16.196.17 - - [29/Jan/2015:15:15:29 +0100] "GET /training/loc/24828/index.html HTTP/1.1" 500 324
6 221.16.196.17 - - [29/Jan/2015:15:15:33 +0100] "GET /training/loc/24828/index.html HTTP/1.1" 200 5314
```

16a. TRUE ◯ FALSE ◯ : line 1 establishes the TCP/IP connection, allowing for subsequent HTTP traffic

16b. TRUE ◯ FALSE ◯ : line 4 is likely logging an action of a different user than those of line 1-3 .

16c. TRUE ◯ FALSE ◯ : line 1 and 4 both return a resource of length 2326. This suggests that the GET is not idempotent, as it should be in a RESTful implementation.

16d. TRUE ◯ FALSE ◯ : line 5 indicates a server-side error .

16e. TRUE ◯ FALSE ◯ : line 6 likely indicates a client-side browser refresh.

END OF EXAM

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