Computer Science 571 2nd Exam
Prof. Horowitz
Tuesday, December 2, 2014, 9:30am – 10:45am

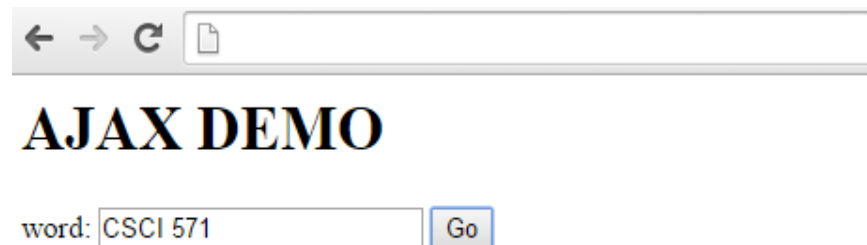**Name:**   **Student ID Number:**

1. **This is a closed book exam.**
2. **Please answer all questions on the test**

- JAVASCRIPT AND AJAX [20 pts]
- JSON [10 pts]
- HIGH PERFORMANCE WEBSITES [20 pts]
- RESPONSIVE WEB DESIGN [15 pts]
- jQUERY [20 pts]
- COOKIES AND PRIVACY [15 pts]

JAVASCRIPT+ AJAX [20 pts]

1. [10 pts] Below is a snapshot of a web page that uses Ajax to call a PHP script (q1.php) that prints out the word placed in a text box (shown below) and the remote user's IP address. Some of the code is missing. Fill in the missing code (5 questions, 2 points each):

Below is the HTML page with three JavaScript functions that perform the XMLHttpRequest and subsequent update to the HTML page. Some of the code is missing in five places. Provide the missing code.

```html
<html><head><title>Example</title>
<script language="Javascript">
function xmlhttpPost(strURL) {
   var xmlHttpReq = false;
   var self = this;
   if (window.XMLHttpRequest) {
      self.xmlHttpReq = new XMLHttpRequest();
   }
   else if (window.ActiveXObject) {
      self.xmlHttpReq = new ActiveXObject("Microsoft.XMLHTTP");
   }
   self.xmlHttpReq.open('POST', strURL, true);
   self.xmlHttpReq.setRequestHeader('Content-Type', 'application/x-www-form-urlencoded');
   self.xmlHttpReq.onreadystatechange = function() {
      if (self.xmlHttpReq.readyState == 4) {
         updatepage(self.xmlHttpReq.responseText);
      }
   }
   self.xmlHttpReq.send(getquerystring());
}
function getquerystring() {
   var form    = document.forms['f1'];
   var word = form.word.value;
   qstr = 'w=' + escape(word);  // NOTE: no '?' before querystring
   return qstr;
}
function updatepage(str){
   document.getElementById("result").innerHTML = str;
}
</script></head><body>
<form name="f1">
 <p>word: <input name="word" type="text">
 <input value="Go" type="button" onclick='JavaScript:xmlhttpPost("/q1.php")'></p>
 <div id="result"></div>
</form></body></html>
```

2. [10 pts] Construct a PHP script that carries out the steps outlined above

```php
<?php
        $word = $_POST["w"];
        echo "You typed the word: <i>".$word.
            "</i> and your IP address is: <i>".
```

JSON [10 pts]

3. [10 pts] Below is an XML file. Translate it into JSON

```
<!DOCTYPE glossary PUBLIC "-//OASIS//DTD DocBook V3.1//EN">
 <glossary><title>example glossary</title>
  <GlossDiv><title>S</title>
   <GlossList>
    <GlossEntry ID="SGML" SortAs="SGML">
     <GlossTerm>Standard Generalized Markup Language</GlossTerm>
     <Acronym>SGML</Acronym>
     <Abbrev>ISO 8879:1986</Abbrev>
     <GlossDef>
      <para>A meta-markup language,languages such as DocBook.</para>
      <GlossSeeAlso OtherTerm="GML">
      <GlossSeeAlso OtherTerm="XML">
     </GlossDef>
     <GlossSee OtherTerm="markup">
    </GlossEntry>
   </GlossList>
  </GlossDiv>
 </glossary>
```

Answer

```
{
    "glossary": {
        "title": "example glossary",
            "GlossDiv": {
            "title": "S",
                "GlossList": {
                "GlossEntry": {
                    "ID": "SGML",
                "SortAs": "SGML",
                "GlossTerm": "Standard Generalized Markup Language",
                "Acronym": "SGML",
                "Abbrev": "ISO 8879:1986",
                "GlossDef": {
            "para": "A meta-markup language, languages such as DocBook.",
                "GlossSeeAlso": ["GML", "XML"]
                    },
                "GlossSee": "markup"
                 }
             }
         }
     }
}
```

HIGH PERFORMANCE WEBSITES [20 pts]

4. [5 pts] Among the 14 rules that were given for improving the client-side performance of a web page, one rule suggests placing items at the bottom of the web page. What rule is it?

Answer: place scripts to the bottom

5. [5 pts] Consider the following HTTP response header

```
HTTP/1.1 200 OK
Date: Fri, 30 Oct 2014 13:19:41 GMT
Server: Apache/1.3.3 (Unix)
Cache-Control: max-age=3600, must-revalidate
Expires: Fri, 30 Oct 2014 14:19:41 GMT
Last-Modified: Mon, 29 Jun 2014 02:28:12 GMT
ETag: "3e86-410-3596fbbc"
Content-Length: 1040
Content-Type: text/html
```

Will this page be cached by the browser? If so, for how long?

Answer: yes, 3600 seconds

6. [5 pts] What does CDN stand for and how does it improve website performance?

Answer: Content Distribution Network; it improves performance by copying content to multiple servers around the world so pages are delivered more quickly.

7. [5 points] Why is it suggested to minimize re-directs?

Answer: because they require an additional trip to the server and back again.

8. [5 pts] The lecture on high performance web sites listed 14 ways to improve the download performance of a website. List 5 of the ways that were presented by providing one or two sentences that describe what they are. PLACE ALL ANSWERS BELOW

    a.   Make fewer http requests

    b.   Use a CDN

    c.   Add and expires header

    d.   Gzip components

    e.   Put stylesheets at the top

    f.   Move scripts to the bottom

g. Avoid CSS expressions

h. Make JS and CSS external

i. Reduce DNS lookups

j. Minify JavaScript

k. Avoid redirects

l. Remove duplicate scripts

m. Configure Etags

n. Make AJAX cacheable

RESPONSIVE WEB DESIGN [15 pts]

Below are two screenshots from a single web page, with the only difference being the re-sizing of the browser. The reason for the page is to show how to proportionally scale images that have dimension attributes.
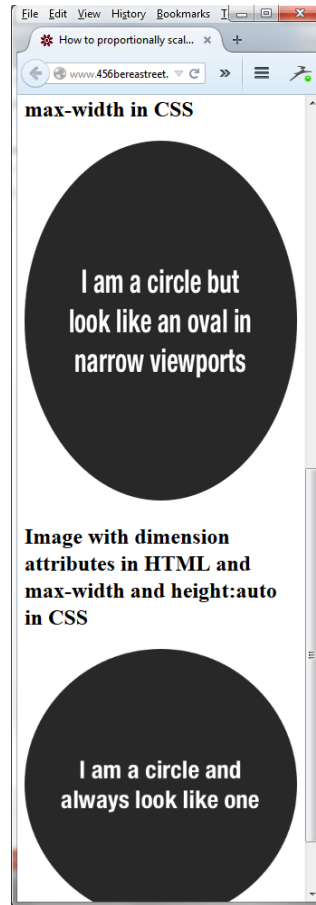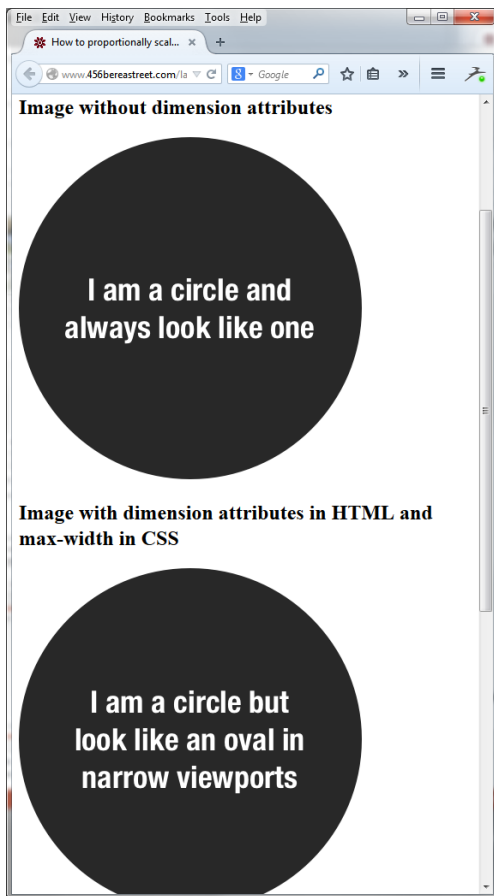
Below is the source code that produced the two screenshots above. Answer the questions that come after the source code.

```
<!DOCTYPE html><html lang="en">
<head><meta charset="utf-8" />
<title>How to proportionally scale images that have
dimension attributes </title>
<style>
    #body { max-width:600px;  margin:0 auto; }
    img {  max-width:100%; }
    #image-3 { width:auto;  max-width:100%; height:auto; }
</style>
</head>
<body>
<div id="body">
<h1>How to proportionally scale images that have dimension
attributes – demo page</h1>
```

```
<p>This is a demo document related to the article
"How to proportionally scale images with dimension
attributes"
<h2>Image without dimension attributes</h2>
<img id="image-1" src="circle-1.png" alt="I am a circle and
always look like one" />
<h2>Image with dimension attributes in HTML and max-width
in CSS</h2>
<img id="image-2" src="circle-2.png" width="400"
height="400" alt="I am a circle but look like an oval in
narrow viewports" />
<h2>Image with dimension attributes in HTML and max-width
and height:auto in CSS</h2>
<img id="image-3" src="circle-1.png" alt="I am a circle and
always look like one" />
</div></body></html>
```

9. [5 pts] How many circles are displayed in the web page by the source code above?
Answer: 3

**10. [5 pts] How narrow can the width of the browser be made?**
Answer: 600px

11. [5 pts] What line or statement in the source code causes the image whose label is "I am a circle but look like an oval in narrow viewports" to actually deform into an oval when the browser width is narrowed?
Answer: the use of style setting for id="image-3" namely setting width and height to auto

jQuery [20 pts]

12. [10 pts] Below is a screenshot of the code that was produced on a desktop computer running FireFox.
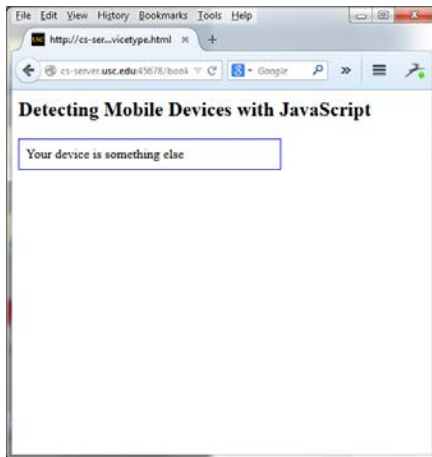
Below is the actual source code, with some of the code removed. Please fill in the missing code.

```html
<html><head>
        <script type="text/javascript"
src="http://ajax.googleapis.com/ajax/libs/jquery/1.4.4/jquery.min.js">
</script></head><body>
<h2>Detecting Mobile Devices with JavaScript</h2>
<div id="browserInfo" style="padding:8px; border:1px solid blue;
width:300px;"></div>
<script type="text/javascript">
        $(document).ready(function(){
if(navigator.userAgent.match(/Android/i)){
        $('#browserInfo').text("Your device is Android");
        }
        else if(navigator.userAgent.match(/iPhone/i)){
                $('#browserInfo').text("Your device is iPhone");
        }
        else if(navigator.userAgent.match(/iPad/i)){
                $('#browserInfo').text("Your device is iPad");
        }
        else{
                $('#browserInfo').text("Your device is something else");
                }
        }
);
</script><noscript></body></html>
```

13. [10 pts] Below are two screenshots that were produced on a desktop computer running FireFox.
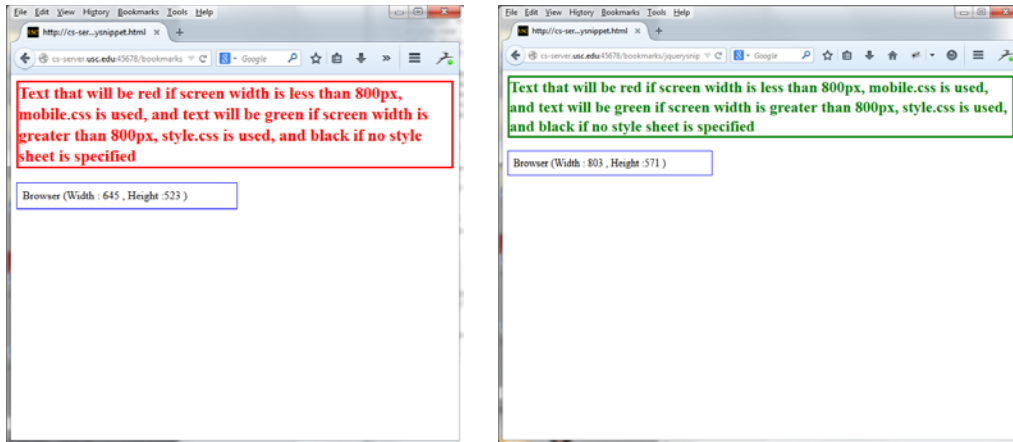
Below is the actual source code, with some of the code removed. Please fill in the missing code.

There are two style sheet files (style.css, mobile.css). If the window width is less than 800px, mobile.css is applied. Otherwise, style.css is used.

```html
<html><head>
        <link rel="stylesheet" href="style.css" type="text/css" />
        <script type="text/javascript"
src="http://ajax.googleapis.com/ajax/libs/jquery/1.4.4/jquery.min.js">
</script></head><body>
<h2>Text that will be red if screen width is less than 800px,
mobile.css is used, and text will be green if screen width is greater
than 800px, style.css is used, and black if no style sheet is
specified</h2>
<div id="browserInfo" style="padding:8px; border:1px solid blue;
width:300px;"></div>
<script type="text/javascript">
        $(document).ready(function(){
                resizeWindow();
                $(window).bind('resize', resizeWindow);
        });
        function resizeWindow(){
        $('#browserInfo').text('Browser (Width : ' + $(window).width() +
' , Height :' + $(window).height() + ' )');
        var newWindowWidth = $(window).width();
        if(newWindowWidth < 800){
        $("link[rel=stylesheet]").attr({href : "mobile.css"});
                }
                else
                {
                $("link[rel=stylesheet]").attr({href : "style.css"});
                }
        }
</script><noscript></body></html>
```

COOKIES AND PRIVACY [15 PTS]

14. [2 1/2 pts] The class notes list five ways to Opt Out of cookies. Mention 2 of them

Answer

1. **Select "do not track" in your browser Settings**
2. **Download opt-out cookies**
3. **Use the cookie management tools in your web browser**
4. **View current cookies and delete what you don't need.**
5. **Check your account preferences on registration sites**

15. [2 1/2 pts] Cookies include a domain, a path, a name/value pair and an expiration date. There are two other fields that may be included in a cookie. What are they and describe them briefly?
Answer:
Secure – only send over SSL, when the request is https
HttpOnly – only send via an HTTP request, not accessible to scripts

16. [2 1/2 pts] Define: 3ʳᵈ party cookie
Answer: Third-party cookies are cookies that belong to domains different from the one shown in the address bar

17. [2 1/2 pts] Define: Cross Site Scripting (XSS)

Answer: It is a web security violation that enables attackers to inject client-side scripts into web pages

18. [2 1/2 pts] Define: Cross Site Request Forgery (CSRF)

Answer: it is a type of malicious exploit of a website whereby unauthorized commands are transmitted from a user that the website trusts

19. [2 1/2 pts] Define: Who is Anonymous
Answer: Anonymous is an international group of criminal hackers who have shut down many websites