Computer Science 571 2nd Exam
Prof. Papa
Thursday, May 3, 2018, 6:00pm – 7:20pm

Name: **Student ID Number:**

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

Cookies and Privacy Questions [10 pts]

Each question is worth 5 points.

Q1: What is displayed by the alert in the following program?

```
document.cookie = "test1=Hello";
document.cookie = "test2=World";

var myCookie =
document.cookie.replace(/(?:(?:^|.*;\s*)test2\s*\=\s*([^;]*).*$
)|^.*$/, "$1");

alert(myCookie);
```

A1: World

Q2: Define 3 types of cookies.

A2: Any 3 of: session, persistent, third-party, secure, conversion-tracking, server-side client-side

Web Security Questions [20 pts]

Each question is worth 2 points.

Q1: What are common ways that websites get infected?

A1:
[X] SQL Injection attacks
[ ] XSP Scripting attacks
[X] Search Engine result redirection
[X] Using social networking sites to infect users
[X] Attacks on back end virtual hosting companies

[ ] ALL OF THE ABOVE

Q2: Give <u>one</u> example of "weak" password recovery validation

A2:

Any one of these:
1) <u>Information Verification</u>: Asking the user to supply their email address along with their phone number. Note that these are both publicly available.

2) <u>Password Hints</u>: Many users have a tendency to embed the password in the hint itself.

3) <u>Secret Question + Answer</u>: Something like "In which city were you born?" for a password recovery system is easily circumventable today because most of the information is public due to social networking sites.

Q3: What is a JSON array vulnerable to?

A3: JavaScript Hijacking

Q4: Name <u>two</u> techniques used to bypass the same-origin policy.

A4:

Any one of these:
1) JSON and the Dynamic Script Tag
2) JSONP
3) AJAX Proxy
4) Browser Extensions and plugins
5) CORS
6) IFRAME

Q5: What used to be the problem of Domain Keys Identified Mail (DKIM) as implemented by Google Mail?

A5: DKIM keys were too short and could be factored in 24 hours using a notebook.

Q6: What is the TLD used on the "deep web"?

A6: .onion

Q7: What combination of 2 tools adds an extra layer of encryption and anonymity making it virtually impossible to trace a user on the Web?

A7: (Anonymizing) VPN + TOR

Q8: At which point a TOR path becomes "unencrypted"?

A8: the "exit node" to the target web site.

Q9: Who has been the major target, by "size pf breach", of top corporate hacks?

A9: Yahoo

Q10: Define, in a sentence, DDoS.

A10: DDoS, or Distributed Denial of Service occurs when a system is overwhelmed by malicious electronic traffic.

High-Performance Websites Questions [20 pts]

Each question is worth 2 points.

Q1: What Rule is this code an example of?

```
uF(this.L,this.Q,new G(b[a].x,b[a].y));var
c,d,e,f=$L(this,a),g=aM(this,a);e=b=c=d=0;
```

A1: Minification or Obfuscation of JavaScript

Q2: Why should you make JavaScript and CSS external?

A2: Because both can be cached

Q3: Why using a large number of hostnames in a web page is not good for performance?

A3: Because each hostname may involve a time-consuming DNS lookup

Q4: When is the use of ETags not recommended?

A4: When using "farms" of Apache servers.

Q5: What is the interaction between favicon.ico and cookies and how do you optimize it?

A5: Each time the browser requests this file, the root cookies are sent, so they should be small

Q6: Where should you put style sheets and why to optimize performance?

A6: At the top, because IE blocks rendering of the page until all style sheets have been examined.

Q7: Where should you put scripts and why to optimize performance?

A7: At the bottom, because scripts block everything from rendering below them in the page

Q8: Should a web server compress images? If yes or no, elaborate why.

A8: No, should not compress images, because all types (JPG, PNG, GIF) are already compressed.

Q9: Should you scale images or not, and why?

A9: No, because 1) rescaling in the browser is time consuming and 2) sending an image larger than needed transfers more bytes than necessary

Q10: What are the two (2) rules (of the initial 14 Souders/Theurer rules) that minimize the transfer of information between server and browser?

A10: compression and JavaScript minification

HTML5 Questions [20 pts]

Each question is worth 2 points.

Q1: In a <canvas> element what is the purpose of the "id" attribute?

A1: to obtain the "drawing context" using getContext()

Q2: Which of the following are new elements in HTML5?

[X] article
[X] aside
[ ] applet
[X] header
[ ] column
[X] nav
[ ] ALL OF THE ABOVE

Q3: Which of the following are removed elements in HTML5?

A3:

[X] center
[X] font
[ ] footer
[X] applet
[ ] time
[X] frameset
[ ] ALL OF THE ABOVE

Q4: Name <u>three</u> new elements requested by newspaper publishers?

A4: Any 3 of header, footer, nav, article, section, aside.

Q5: What is the required attribute of the <video> element in HTML5, when the video is in a single format?

A5: src

Q6: What are Quicktime (.MOV) and Flash (.FLV) files?

A6: video "containers"

Q7: Which of the following are <u>new</u> in HTML5?

[X] video and audio support
[X] graphics support
[X] local storage
[ ] SQL support
[X] Geocoding support
[X] Semantic elements
[X] CSS3 support
[ ] ALL OF THE ABOVE

Q8: What happened to the HTML 4.01 elements <center> and <font> in HTML5?

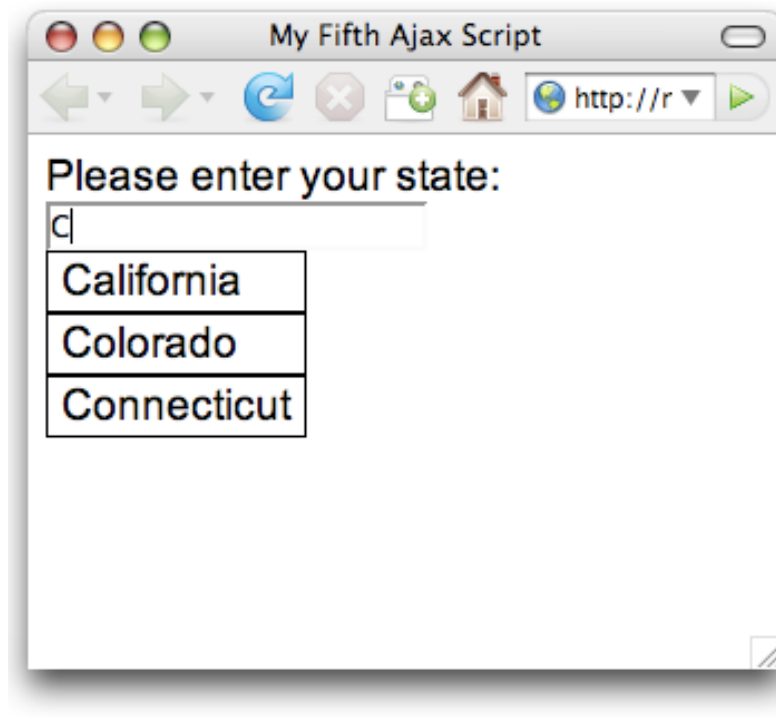**A8: They have been moved to CSS**

Q9: Name 4 Audio Codecs

A9: Any 4 from MP3, AAC, AAC+, VORBIS, FLAC

Q10: If you needed to make sure that your video files could be viewed on the large majority of browsers, what two video containers would you pick?

A10: MPEG4 and WebM

JavaScript and Ajax Questions [10 pts]

Below is the HTML source code that produces the web page above. There is one edit box, and when each character is typed, a list appears that shows the "suggested" valid answers, obtained from the XML file us-states.xml.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN">
<html>
<head>
    <title>My Fifth Ajax Script</title>
    <link rel="stylesheet" rev="stylesheet"
href="script05.css" />
    <script src="script05.js" type="text/javascript"
language="Javascript">
    </script>
</head>
<body>
    <form action="#">
        Please enter your state:<br />

        <input type="text" id="searchField"
autocomplete="off" /><br />
        <div id="popups"> </div>
    </form>
```

```
</body>
</html>
```

**Below is the JavaScript source code, script05.js, that was imported into the
HTML above, but some of the lines are missing, replaced by XXXXXXXs.
Fill in the missing.**

```javascript
window.onload = initAll;
var xhr = false;
var statesArray = new Array();

function initAll() {
    document.getElementById("searchField").onkeyup =
searchSuggest;

    if (window.XMLHttpRequest) {
        xhr = new XMLHttpRequest();
    }
    else {
        if (window.ActiveXObject) {
            try {
                xhr = new
ActiveXObject("Microsoft.XMLHTTP");
            }
            catch (e) { }
        }
    }

    if (xhr) {
        xhr.onreadystatechange = setStatesArray;
        xhr.open("GET", "us-states.xml", true);
        xhr.send(null);
    }
    else {
        alert("Sorry, but I couldn't create an
XMLHttpRequest");
    }
}

function setStatesArray() {
    if (xhr.readyState == 4) {
        if (xhr.status == 200) {
            if (xhr.responseXML) {
                var allStates =
xhr.responseXML.getElementsByTagName("item");
                for (var i=0; i<allStates.length; i++) {
```

```
                                  statesArray[i] =
allStates[i].getElementsByTagName("label")[0].firstChild;
                        }
                    }
            }
            else {
                    alert("There was a problem with the request " +
xhr.status);
                }
        }
}

function searchSuggest() {
        var str = document.getElementById("searchField").value;
        document.getElementById("searchField").className = "";
        if (str != "") {
            document.getElementById("popups").innerHTML = "";

            for (var i=0; i<statesArray.length; i++) {
                    var thisState = statesArray[i].nodeValue;

                    if
(thisState.toLowerCase().indexOf(str.toLowerCase()) == 0) {
                            var tempDiv =
document.createElement("div");
                            tempDiv.innerHTML = thisState;
                            tempDiv.onclick = makeChoice;
                            tempDiv.className = "suggestions";

        document.getElementById("popups").appendChild(tempDiv);
                    }
                }
            var foundCt =
document.getElementById("popups").childNodes.length;
            if (foundCt == 0) {
                    document.getElementById("searchField").className
= "error";
                }
            if (foundCt == 1) {
                    document.getElementById("searchField").value =
document.getElementById("popups").firstChild.innerHTML;
                    document.getElementById("popups").innerHTML =
"";
                }
        }
}
```

```
function makeChoice(evt) {
    var thisDiv = (evt) ? evt.target :
window.event.srcElement;
    document.getElementById("searchField").value =
thisDiv.innerHTML;
    document.getElementById("popups").innerHTML = "";
}
```

[for graders: each line is worth 2 points]

JQuery Questions [10 pts]

Each question is worth 2 points.

Q1: (2 points) What is the JQuery code that corresponds to the following?

`var myButton = document.getElementById("myButton");`

A1: `$("#myButton");`

Q2: (2 points) What are <u>three</u> examples of JQuery "basic" selectors?

A2: Any 3 of All, Class, Element, ID and Multiple.

Q3: If you were to use JQuery make your code independent of Browser differences, which set of functions would you pick?

A3: JQuery AJAX Functions

Q4: Name 2 categories of JQuery selectors

A4: Any 2 of Attribute, Basic, Basic Filter, Child Filter, Content Filter, Form

Q5: [Each "correct" missing line is worth 1 point. NO PARTIAL CREDIT]

Consider the following example without JQuery:

```
hex=255 // Initial color value.
function fadetext() {
 if(hex>0) { //If color is not black yet
     hex -= 11; // increase color darkness

document.getElementById("sample").style.color="rgb("+hex+","+he
x+","+hex+")";
     setTimeout("fadetext()",20);    }
```

```
    else    hex=255 //reset hex value
}
```

A5: Rewrite it using JQuery. Assume #fadeText is the id of the button.

```
$(function() { // when document is ready
     $("#fadeText").click(function() { // set a onClick handler
on fadeText
          $("h3").fadeOut(125).delay().fadeIn(125);
          // fadeOut the h3 for 125 ms, delay, then fadeIn for
125 ms
     });
});

Grading Guidelines:

If any student came with different solution might be correct
please spread the solution to the other graders to take a
decision
```

JavaScript Frameworks, Libraries & Serverless Questions [10 pts]

Each question is worth 2 points.

Q1. Which of the following are TRUE of React?

[X] ReactJS is a "view layer library
[ ] ReactJS is a framework like AngularJS
[ ] ReactJS implements MVC
[X] Using ReactJS it is easy to mix HTML and JavaScript
[X] React Native allows to build iOS apps
[ ] ALL OF THE ABOVE

Note: there is no partial credit

Q2. What is JSX?

A2. JavaScript XML, a syntax extension to JavaScript

Q3. Which of the following are TRUE of Firebase?

[X] Is a cross platform set of tools
[X] Includes functionality for authentication
[ ] Includes functionality for data mapping
[ ] Requires the use of a GCP project

[ ] ALL OF THE ABOVE

Note: <u>there is no partial credit</u>

Q4. Which of the following are TRUE of Node.js?

[X] Is a JavaScript runtime built on Chrome V8
[ ] Uses blocking IO model
[X] Includes modules that handle HTTP
[ ] Includes modules that handle IP
[X] Is bundled with 'npm'
[ ] ALL OF THE ABOVE

Note: <u>there is no partial credit</u>

Q5. Name 2 platforms for serverless architectures.

A5. Any 2 of AWS Lambda, GCP Functions, Azure Functions, and IBM OpenWhisk