

Computer Science 571 2nd Exam
Prof. Papa
Tuesday, April 28, 2015, 5:30pm – 6:50pm

Name:

Student ID Number:

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

Security and Privacy Questions [10 pts]

Each question is worth 2 points.

Q1: What is a recent technique to construct highly secure passwords?

A1: create long passphrases using Diceware, based on rolling a dice and looking up 7,000+ words

Q2: What functionality do PGP and S/MIME provide?

A2: Encryption and signing of e-mail messages

Q3: What is the main functionality of TOR?

A3: TOR is a network that provides an anonymous path between a client (browser) and a server (web site)

Q4: Why are browser plugins inherently insecure?

A4: Because they bypass the browser sandbox, and can execute arbitrary malicious code

Q5: Is it possible to send a virus in a cookie?

A5: YES [] No [X]

Hi-Performance Web Questions [10 pts]

Each question is worth 2 points.

Q1. What percentage of the end-user response time is spent in the front-end?

80-90%

Q2. What are 2 ways that reduce the number of HTTP requests?

Combine scripts

Combine Style Sheets

Use image maps

Use CSS Sprites

Q3. What 5 components can be GZIP-ed?

HTML, CSS, JavaScript, JSON, XML

Q4. What 2 components should not be GZIP-ed?

Images and PDF

Q5. Where should CSS and scripts be placed in a HTML file?

CSS at top, scripts at bottom

HTML5 Questions [10 pts]

Each question is worth 2 points.

Q1: The use of the <div> tag has been replaced by a number of new elements included in HTML5. Name two of them

A1: Any 2 of header, footer, section, article, nav, aside

Q2: Which of the following capabilities are included in HTML5?

A2:

☐ drag file in browser

☐ interactive canvas gradient

☐ editable content

☐ geolocation

☐ drag and drop

☐ storage

☒ ALL OF THE ABOVE

[You must choose the correct choice or choices. There is no partial credit]

Q3: What is the purpose of the different “profiles” included in the H. 264 video standard?

A3: each profile defines a set of optional features that trade complexity for file size.

Q4: What is the meaning of the “preload” video attribute?

A4: specifies that the video will be loaded at page load and ready to run.

Q5: If you were asked to make sure that your video files could be viewed on the large majority of browsers, what two video containers would you select?

A5: MPEG4 and WebM

JSON/AJAX Questions [20 pts]

Each question is worth 2 points.

Q1: Which of the following calls to send() is invalid? Circle your answer.

a. send()

b. **send(null)**

c. send(“x=1&y=2”)

Q2: What is the major difference in behavior between client and server in an AJAX transaction?

AJAX transactions are asynchronous

Q3: What are the 4 basic technologies in AJAX?

HTML, CSS, JavaScript, and XML (or JSON)

Q4: Which readyState and Status combination should you check for to know that an AJAX request is complete? Circle your answer.

a. 3 and 304

b. 2 and 200

c. **4 and 200**

d. 5 and 404

Q5: List 3 properties of JSON

- **Subset of ECMA-232 Third Edition**
- **Language independent**
- **text-based**
- **light-weight**
- **Easy to parse**
- **Not a document format**
- **Not a markup language**
- **Not a serialization format**

Q6. What is a possible drawback of the eval ()function?

The eval() technique is subject to security vulnerabilities

Q7. What is the first index in a JSON array?

JSON does not talk about indexing: can be 0 or 1

Q8. JSON Parsers (True / False)

A JSON encoder must only produce well-formed JSON text [☒]True [☐]False

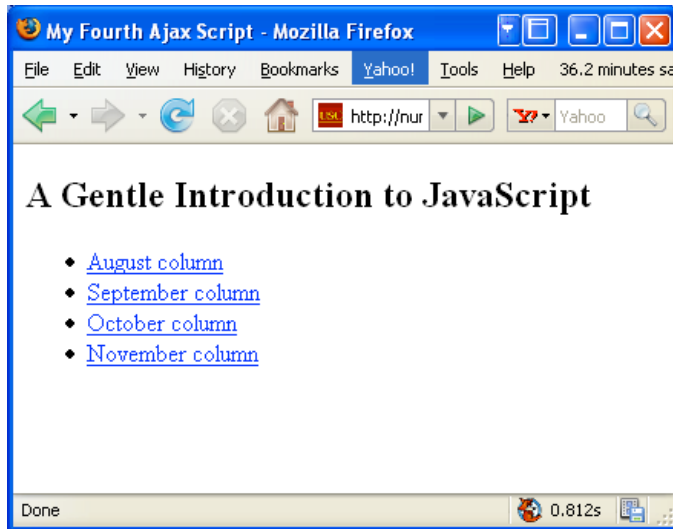
Q9. What is JSONP?

"JSON with padding" is a JSON extension wherein the name of a callback function is specified as an input argument of the call itself.

Q10. What are the responsibilities of an “AJAX engine”?

“render” the user interface, interact with the user, communicate asynchronously with the server.

JavaScript and Ajax Questions [10 pts]



Below is the HTML source code that produces the web page above. There are 4 links. When the user cursor is placed over each link, a pop-up widget is displayed viewing the contents of the Web page being hyperlinked.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN">
<html>
<head>
    <title>My Fourth Ajax Script</title>
    <link rel="stylesheet" rev="stylesheet" href="script04.css"
/>
    <script src="script04.js" type="text/javascript"
language="Javascript">
    </script>
</head>
<body>
<h2>A Gentle Introduction to JavaScript</h2>
<ul>
    <li><a href="jsintro/2000-08.html">August Page</a></li>
    <li><a href="jsintro/2000-09.html">September Page</a></li>
    <li><a href="jsintro/2000-10.html">October Page</a></li>
    <li><a href="jsintro/2000-11.html">November Page</a></li>
</ul>
<div id="previewWin"> </div>
</body>
</html>
```

Below is the JavaScript source code, script04.js, that was imported into the HTML above, but some of the lines are missing, replaced by XXXXXXXXs. Fill in the missing.

```
window.onload = initAll;
var xhr = false;
var xPos, yPos;

function initAll() {
    var allLinks = document.getElementsByTagName("a");
```

```

        for (var i=0; i< allLinks.length; i++) {
            allLinks[i].onmouseover = showPreview;
        }
    }

function showPreview(evt) {
    getPreview(evt);
    return false;
}

function hidePreview() {
    document.getElementById("previewWin").style.visibility = "hidden";
}

function getPreview(evt) {
    if (evt) {
        var url = evt.target;
    }
    else {
        evt = window.event;
        var url = evt.srcElement;
    }

    xPos = evt.clientX;
    yPos = evt.clientY;

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

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

function showContents() {
    var prevWin = document.getElementById("previewWin");

    if (xhr.readyState == 4) {
        prevWin.innerHTML = (xhr.status == 200) ? xhr.responseText :
        "There was a problem with the request " + xhr.status;
        prevWin.style.top = parseInt(yPos)+2 + "px";
        prevWin.style.left = parseInt(xPos)+2 + "px";
        prevWin.style.visibility = "visible";
        prevWin.onmouseout = hidePreview;
    }
}

```

```
}  
}
```

[for graders: each line is worth 2 points]

JQuery Questions [10 pts]

Q1 (2 pts): Please give an example of a jQuery Basic Class selector that modifies a “border” property.

A1: `$(".myClass").css("border", "3px solid red");`

Q2 (2 pts): What does jQuery simplify?

A2:

☒ **HTML document traversing**

☒ **XMLHttpRequest**

☐ **HTTP header manipulat**

☒ **Event Handling**

☒ **Animating**

☒ **AJAX interactions**

☐ **ALL OF THE ABOVE**

[You must choose the correct choice or choices. There is no partial credit]

Q3 (6 pts): [This question is worth 6 points] Consider the following example without jQuery:

```
<html>  
<body><DIV ID="counter">Number of clicks = 0</DIV>  
<FORM> <INPUT TYPE="button" VALUE="Increment Counter"  
    onclick="updateMessage()">  
</FORM>  
<SCRIPT LANGUAGE="JavaScript">  
    var hits = 0;  
    function updateMessage() {  
        hits += 1;  
        document.getElementById("counter").innerHTML = "Number of clicks = " +  
hits; }  
</SCRIPT>  
<noscript></body>
```

A3: Rewrite it using JQuery.

```

<html>
<head>
<meta charset="UTF-8">
<script
src="https://ajax.googleapis.com/ajax/libs/jquery/1.9.0/jquery.min.js"></scr
ipt>
<script>
$(function() {
    var hits = 0;
    $("#updateMessage").click(function() {
        $("#counter").html("Number of clicks = " + ++hits);
    });
});
</script>
</head>
<body>
<DIV ID="counter">Number of clicks = 0</DIV>
<FORM> <INPUT TYPE="button" VALUE="Increment Counter"
id="updateMessage">
</FORM>

<noscript>
</body>

```

Grading Guidelines:

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

Responsive Website Design Questions [10 pts]

Each question is worth 2 points.

Q1: Mention one reason why hosting a separate .mobi website is not recommended?

A1: possible answers:

- (1) Requires duplication of content**
- (2) Over time can result in synchronization of content issues**
- (3) May work only on a specific mobile size**

Q2: Why hosting a mobile website within your current domain (m.mycompany.com) is not recommended?

A2:

- (1) Redirect take time**
- (2) Redirect and hinder search engines**
- (3) May work only on a specific mobile size**

Q3: What is the CSS code (property and value) to hide content on small screens?

A3: display: none; -OR- visibility: hidden;

Q4: RWD is abased on “media queries. Please write an example of a media query.

A4: `<link rel="stylesheet" type="text/css" media="screen and (max-device-width: 480px)" href="min.css" />`

Answering screen and (max-device-width: 480px) is enough

Q5: List one property of “fluid” grids.

A5: Any one of these: (a) defined using relative-based dimensions (b) define a grid divided into a specific number of columns (c) each grid element is designed with “proportional” width and height, not in pixels

XML Schema Questions [20 pts]

Consider the following XML empty complex element that has no content, and only one attribute:

```
<product prodid="1345" />
```

[10 pts] Write an XML Schema that defines a “product” element using, xs:element. Xs:complexType and positive integer xs:attribute:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified">
```

```
<xs:element name="product">
  <xs:complexType>
    <xs:attribute name="prodid"
type="xs:positiveInteger"/>
  </xs:complexType>
</xs:element>
```

```
</xs:schema>
```

Consider the following simple XML instance document, note.xml:

```
<?xml version="1.0"?>
<note>
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note>
```

[10 pts] Write an XML Schema that conforms to such document:

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.w3schools.com"
xmlns="http://www.w3schools.com"
elementFormDefault="qualified">

  <xs:element name="note">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="to" type="xs:string"/>
        <xs:element name="from" type="xs:string"/>
        <xs:element name="heading" type="xs:string"/>
        <xs:element name="body" type="xs:string"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

</xs:schema>
```