Computer Science 571 Exam #1
Prof. Papa
Tuesday, February 20, 2018, 6:00pm – 7:20pm

Name: _____   **Student Id Number:** _____

1. This is a closed book exam.
2. Please answer all questions.
3. Place all answers on the exam and return the entire exam.

JSON QUESTIONS [20 PTS]

Consider the following <script> tag which includes a 'src' attribute referring to a Google spreadsheet.

```
<script

    src="http://spreadsheets.google.com/feeds/list/o03712292828507838
    454.2635427448373779250/od6/public/basic?alt=json-in-
    script&callback=listTasks">

</script>

<div id="agenda"></div>
```

the URL in the above script will return the following JSON result:

```
listTasks ({"version":"1.0","encoding":"UTF-8", "feed":{
  "entry":[{
    {
    "title": {"type":"text","$t":"Hello World!"},
    "content": {"type":"text","$t":"Status: Start"}},
  {
   "title": {"type":"text","$t":"Goodbye World!"},
   "content":{"type":"text","$t":"Status: Finish"}
}]}  });
```

Complete the program That will output the following in the <DIV> section:

```
<ul>
  <li> Hello World! (Status: Start) </li>
  <li> Goodbye World! (Status: Finish) </li>
<ul>
```

Each missing line is listed as XXXXXXxx.

```
function listTasks(root) {

var feed = root.feed;

var entries = feed.entry || [];

var html = [''];

html.push('<ul>');

for (var i = 0; i < feed.entry.length; ++i) {

     var entry = feed.entry[i];

     var title = entry.title.$t;

     var content = entry.content.$t;

     html.push('<li> ', title, ' (', content, ')  </li>');

}

html.push('</ul>');

document.getElementById("agenda").innerHTML = html.join("");
```

PHP QUESTIONS [20 PTS]

Below are two screenshots of a web page, an initial screenshot, and then another screenshot after some fields have been filled in and the Submit button is clicked. Below is the PHP code that was used. Some lines have missing code Provide the missing code.

PHP Form Validation Example

* required field.

Name: [_____] *

E-mail: [_____] *

Website: [_____]

Comment: [_____]

Gender: ◯Female ◯Male *

[Submit]

Your Input:

---

* required field.

Name: [_____] * Name is required

E-mail: [papa@usc.edu] *

Website: [_____]

Comment: [_____]

Gender: ◯Female ⦿Male *

[Submit]

Your Input:

papa@usc.edu

male

```
<!DOCTYPE HTML>
<html>
<head>
<style>
.error {color: #FF0000;}
</style>
</head>
<body>

<?php
// define variables and set to empty values
$nameErr = $emailErr = $genderErr = $websiteErr = "";
$name = $email = $gender = $comment = $website = "";

if ($_SERVER["REQUEST_METHOD"] == "POST") {
   if (empty($_POST["name"])) {
     $nameErr = "Name is required";
   } else {
     $name = test_input($_POST["name"]);
     // check if name only contains letters (upper and lowercase) and
whitespace
     if (!preg_match("/^[a-zA-Z ]*$/",$name)) {
       $nameErr = "Only letters and white space allowed";
     }
   }

   if (empty($_POST["email"])) {
     $emailErr = "Email is required";
   } else {
     $email = test_input($_POST["email"]);
     // check if e-mail address is well-formed
     if (!filter_var($email, FILTER_VALIDATE_EMAIL)) {
       $emailErr = "Invalid email format";
     }
```

```php
  }

  if (empty($_POST["website"])) {
    $website = "";
  } else {
    $website = test_input($_POST["website"]);
    if (!preg_match("/\b(?:(?:https?|ftp):\/\/|www\.)[-a-z0-
9+&@#\/%?=~_|!:,.;]*[-a-z0-9+&@#\/%=~_|]/i",$website)) {
      $websiteErr = "Invalid URL";
    }
  }

  if (empty($_POST["comment"])) {
    $comment = "";
  } else {
    $comment = test_input($_POST["comment"]);
  }

  if ( empty($_POST["gender"]) ) {
    $genderErr = "Gender is required";
  } else {
    $gender = test_input($_POST["gender"]) ;
  }
}

function test_input($data) {
    $data = trim($data);
    $data = stripslashes($data);
    $data = htmlspecialchars($data);
    return $data;
}
?>

<h2>PHP Form Validation Example</h2>
<p><span class="error">* required field.</span></p>
<form method="post" action="<?php echo
htmlspecialchars($_SERVER["PHP_SELF"]);?>">
   Name: <input type="text" name="name" value="<?php echo $name;?>">
   <span class="error">* <?php echo $nameErr; ?></span>
   <br><br>
   E-mail: <input type="text" name="email" value="<?php echo
$email;?>">
   <span class="error">* <?php echo $emailErr;?></span>
   <br><br>
   Website: <input type="text" name="website" value="<?php echo
$website;?>">
   <span class="error"><?php echo $websiteErr;?></span>
   <br><br>
   Comment: <textarea name="comment" rows="5" cols="40"><?php echo
$comment; ?></textarea>
   <br><br>
   Gender:
   <input type="radio" name="gender" <?php if (isset($gender) &&
$gender=="female") echo "checked";?>  value="female">Female
   <input type="radio" name="gender" <?php if (isset($gender) &&
$gender=="male") echo "checked";?>  value="male">Male
   <span class="error">* <?php echo $genderErr;?></span>
   <br><br>
```
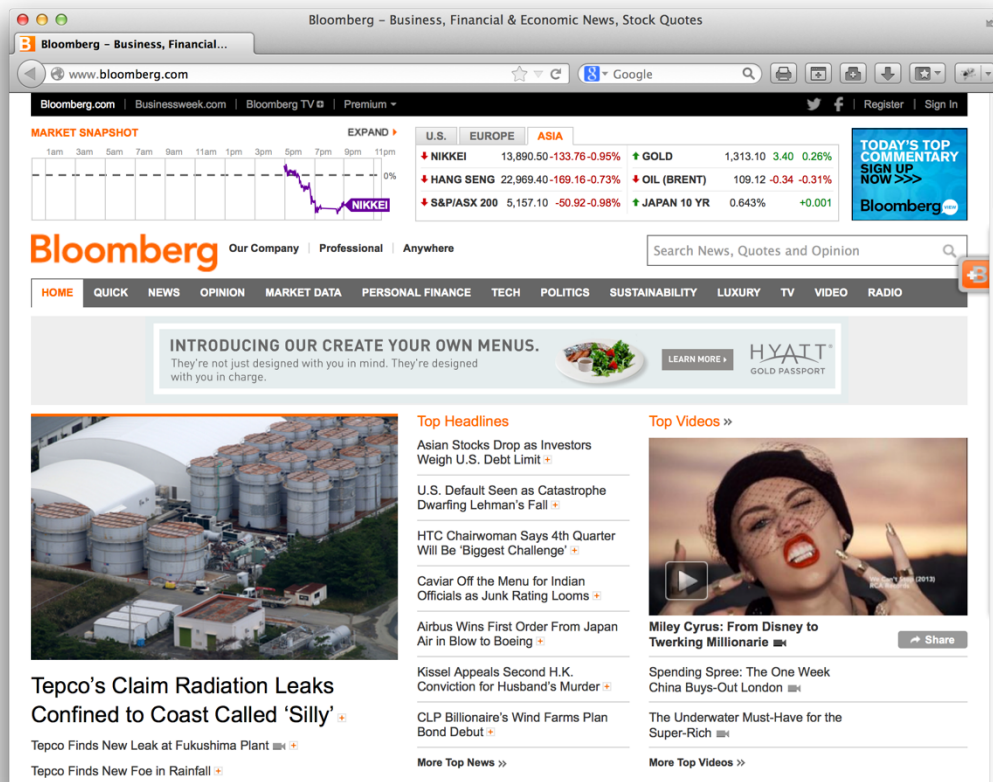
```
    <input type="submit" name="submit" value="Submit">
</form>

<?php
echo "<h2>Your Input:</h2>";
echo $name;
echo "<br>";
echo $email;
echo "<br>";
echo $website;
echo "<br>";
echo $comment;
echo "<br>";
echo $gender;
?>

</body>
</html>
```

HTTP QUESTIONS [20 PTS]

Below is the web page www.bloomberg.com. Following that is part of the exchange of messages between the browser and the server, obtained by running Live HTTP Headers. Answer the questions that follow. Each question is worth 2 points.

```
----------------------------------------------------------
  (1) http://bloomberg.com/

GET / HTTP/1.1
Host: bloomberg.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 301 Moved Permanently
Date: Mon, 07 Oct 2013 04:26:05 GMT
Server: Apache
Location: http://www.bloomberg.com/
Content-Type: text/html; charset=iso-8859-1
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 193
Keep-Alive: timeout=5, max=500
Connection: Keep-Alive
----------------------------------------------------------
(2) http://www.bloomberg.com/

GET / HTTP/1.1
```

```
Host: www.bloomberg.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 200 OK
Status: 200 OK
Content-Type: text/html; charset=utf-8
X-Runtime: 9
Etag: "427fcf8f86c48aee41969a854ac93363"
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 38719
Cache-Control: private, max-age=51
Date: Mon, 07 Oct 2013 04:26:06 GMT
Connection: keep-alive
-----------------------------------------------------------
(3) http://cdn.gotraffic.net/v/20131004_173359/stylesheets/main-min-
v3_1.css

GET /v/20131004_173359/stylesheets/main-min-v3_1.css HTTP/1.1
Host: cdn.gotraffic.net
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: text/css,*/*;q=0.1
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 200 OK
Server: Sun-Java-System-Web-Server/7.0
Vary: Accept-Encoding
Expires: Sat, 04 Oct 2014 22:03:51 GMT
Cache-Control: public,max-age=31536000
Content-Type: text/css
Last-Modified: Fri, 04 Oct 2013 22:01:42 GMT
Etag: W/"3346d-524f3ac6"
Content-Encoding: gzip
Content-Length: 38110
Date: Mon, 07 Oct 2013 04:26:06 GMT
Connection: keep-alive
-----------------------------------------------------------
(4) http://www.bloomberg.com/rapi/js_config.js

GET /rapi/js_config.js HTTP/1.1
Host: www.bloomberg.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
```

```
Connection: keep-alive

HTTP/1.1 200 OK
Status: 200 OK
X-Runtime: 24
Content-Type: text/javascript; charset=utf-8
Etag: "c74967659d54746bf8b22eb67163134b"
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 1439
Cache-Control: private, max-age=16
Date: Mon, 07 Oct 2013 04:26:06 GMT
Connection: keep-alive
--------------------------------------------------------
(5) http://www.bloomberg.com/favicon.ico

GET /favicon.ico HTTP/1.1
Host: www.bloomberg.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 200 OK
Server: Sun-Java-System-Web-Server/7.0
Vary: Accept-Encoding
Content-Type: image/x-icon
Last-Modified: Tue, 24 May 2011 23:03:08 GMT
Etag: W/"47e-4ddc392c"
Content-Encoding: gzip
Content-Length: 316
Cache-Control: max-age=161638
Expires: Wed, 09 Oct 2013 01:20:04 GMT
Date: Mon, 07 Oct 2013 04:26:06 GMT
Connection: keep-alive
--------------------------------------------------------
(6)
http://cdn.gotraffic.net/custom_contents/7bef4987c4e3a931110ba89e93b609
a1.jpg

GET /custom_contents/7bef4987c4e3a931110ba89e93b609a1.jpg HTTP/1.1
Host: cdn.gotraffic.net
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: image/png,image/*;q=0.8,*/*;q=0.5
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 200 OK
Server: Sun-Java-System-Web-Server/7.0
Expires: Thu, 02 Oct 2014 11:02:14 GMT
Cache-Control: public,max-age=31536000
```

```
Content-Type: image/jpeg
Last-Modified: Wed, 02 Oct 2013 11:01:33 GMT
Content-Length: 10373
Etag: "2885-524bfd0d"
Accept-Ranges: bytes
Date: Mon, 07 Oct 2013 04:26:06 GMT
Connection: keep-alive
------------------------------------------------------------
(7) http://www.google-
analytics.com/__utm.gif?utmwv=5.4.5&utms=1&utmn=2013761266&utmhn=www.bl
oomberg.com&utme=8(recommendation_cookie*name*4!markets_video_tab_test*
tv_reco)9(t2bb03*blp.home%3Aindex*4!follow*qt)11(1*4!1*1)&utmcs=UTF-
8&utmsr=1440x900&utmvp=1425x735&utmsc=24-bit&utmul=en-
us&utmje=1&utmfl=11.8%20r800&utmdt=Bloomberg%20-
%20Business%2C%20Financial%20%26%20Economic%20News%2C%20Stock%20Quotes&
utmhid=1044610829&utmr=-&utmp=%2F&utmht=1381119968678&utmac=UA-
11413116-
1&utmcc=__utma%3D30057196.1607550793.1381119969.1381119969.1381119969.1
%3B%2B__utmz%3D30057196.1381119969.1.1.utmcsr%3D(direct)%7Cutmccn%3D(di
rect)%7Cutmcmd%3D(none)%3B&utmu=qQAAAAAAAAAAAAAAAAQ~

GET
/__utm.gif?utmwv=5.4.5&utms=1&utmn=2013761266&utmhn=www.bloomberg.com&u
tme=8(recommendation_cookie*name*4!markets_video_tab_test*tv_reco)9(t2b
b03*blp.home%3Aindex*4!follow*qt)11(1*4!1*1)&utmcs=UTF-
8&utmsr=1440x900&utmvp=1425x735&utmsc=24-bit&utmul=en-
us&utmje=1&utmfl=11.8%20r800&utmdt=Bloomberg%20-
%20Business%2C%20Financial%20%26%20Economic%20News%2C%20Stock%20Quotes&
utmhid=1044610829&utmr=-&utmp=%2F&utmht=1381119968678&utmac=UA-
11413116-
1&utmcc=__utma%3D30057196.1607550793.1381119969.1381119969.1381119969.1
%3B%2B__utmz%3D30057196.1381119969.1.1.utmcsr%3D(direct)%7Cutmccn%3D(di
rect)%7Cutmcmd%3D(none)%3B&utmu=qQAAAAAAAAAAAAAAAAQ~ HTTP/1.1
Host: www.google-analytics.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: image/png,image/*;q=0.8,*/*;q=0.5
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 200 OK
Pragma: no-cache
Expires: Wed, 19 Apr 2000 11:43:00 GMT
Last-Modified: Wed, 21 Jan 2004 19:51:30 GMT
X-Content-Type-Options: nosniff
Content-Type: image/gif
Date: Thu, 26 Sep 2013 23:07:09 GMT
Server: Golfe2
Content-Length: 35
Cache-Control: private, no-cache, no-cache=Set-Cookie, proxy-revalidate
Age: 883139
Alternate-Protocol: 80:quic
------------------------------------------------------------
(8) http://www.google.com/pagead/drt/ui
```

```
GET /pagead/drt/ui HTTP/1.1
Host: www.google.com
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.9; rv:21.0)
Gecko/20100101 Firefox/21.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
DNT: 1
Connection: keep-alive

HTTP/1.1 302 Found
Location:
https://accounts.google.com/ServiceLogin?service=doritos&passive=true&g
o=true
Cache-Control: private
X-Frame-Options: ALLOWALL
Content-Type: text/html; charset=UTF-8
X-Content-Type-Options: nosniff
Date: Mon, 07 Oct 2013 04:26:09 GMT
Server: safe
Content-Length: 407
X-XSS-Protection: 1; mode=block
Alternate-Protocol: 80:quic
-----------------------------------------------------------
(9) TRANSACTION OMITTED INTENTIONALLY
-----------------------------------------------------------
```

Q1: What would be the GET request following transaction #8?

A1: GET /ServiceLogin?service=doritos&passive=true&go=true HTTP/1.1

Q2: How big is the HTML of the Bloomberg's home page?

A2: 38719 bytes

Q3: How many redirects are listed and what are those transactions?

A3: 2 redirects, #1 and #8

Q4: Why are transactions (3) and (4) responding with an Etag?

A4: Because CSS and JavaScript can be cached by the browser

Q5: Of the servers listed, which are compressing their responses?

A5: **Apache, Sun-Java-System-Web-Server/7.0**

Q6: What content is Google Analytics responding with?

A6: **A 35-byte GIF image – OR – AN IMAGE named __utm.gif**

Q7: Why is the content returned by transaction (6) not compressed?

A7: **Because JPG images should not be compressed, as they already are.**

Q8: What is the purpose of transaction (5)?

A8: **Provide an icon (always named favicon.ico) to be used on the left side of the address field in a browser.**

Q9: What content distribution network (CDN) is Bloomberg using?

A9: **cdn.GoTraffic.net**

Q10: What character sets are used in these transactions?

A10: **iso-8859-1, utf-8**

CSS QUESTIONS [10 PTS]

Below are lines extracted from the CSS sheet of espn.com. For each line answer the question. Each question is worth 2 points.

Q1: What does this declaration do?

```
.logo-nba-large {
    background-image:
url(http://a4.espncdn.com/prod/assets/teamlogos/nba/logo-nba-
teams-large-vert.png);
    background-position: -100px 0;
    background-repeat: no-repeat
}
```

A1: **Creates a generic CSS class named logo—nba-large that sets a background image and its position and does not repeat it.**

Q2: Give an HTML example usage of the declaration below:

```
body.page2 #header h1.phrase {
    position: absolute;
    top: 36px;
    left: 189px;
    font: 12px Helvetica, Arial, sans-serif;
    color: #fee399;
    padding: 2px;
    padding-right: 10px;
    width: 470px
}
```

A2:

```
<body class=page2>
    <div id=header>
        <H1 class=phrase>
        This is my phrase
        </H1>
    </div>
</body>
```

Q3: Give an HTML example usage of the declaration below:

```
#header div.insider-logo a {
    display: block;
    height: 25px;
    position: relative !important
}
```

A3:

```
<H1 id=header>
    <div class=insider-logo>
        <a href=http://www.myco.com>
    </div>
</H1>
```

Q4: Give an HTML example usage of the declaration below:

```
.article p {
    margin-bottom: 10px;
    line-height: 17px;
    color: #333
```

```
}
```

A4:

```
<div class=article>
      <p>this is an article</p>
</div>
```

Q5: Write the CSS to create a "class" named "photo-enlarge" that applies only to the "BODY" element and a generic "id" name "header", in such a way that when an "anchor" is inside an element with id=header, which in an HTML file with BODY with class=photo-enlarge, the following settings are modified as such:

```
float: right;
color: #FFF;
font-size: 10px;
font-family: Verdana, Arial, Helvetica, sans-serif;
padding-right: 14px;
margin: 8px 10px
```

A5:

```
body.photo-enlarge #header a {
    float: right;
    color: #FFF;
    font-size: 10px;
    font-family: Verdana, Arial, Helvetica, sans-serif;
padding-right: 14px;
    margin: 8px 10px
}
```

WEB SERVER/HTTP QUESTIONS [20 PTS]

Suppose you are a small startup company in the United States selling imported tennis balls from Indonesia. Your company is called IndoTennis and you have 3 employees. You intend to sell the imported tennis balls to any and all customers who visit your website and wish to purchase them. Unfortunately, your company has little money to spare and you can only afford one computer to host your website. You have no budget for software and OS purchase. **Provide short answers to each question below.**

1. What operating system will the computer likely run?

Linux/Fedora/Debian/Ubuntu (Any Linux flavour)

2. What web server will the computer likely run?

Apache or Nginx

3. How do you get a static IP address to associate to your website?

From the ISP or the service provider you are getting services from.

4. How do you sign up for a domain name, say www.indotennis.com?

You register the domain name with an ICANN approved registrar

5. In the configuration file of your web server, name two critical features that may have to be modified in order to host the website.

Any two of Server Root, Document Root, Location of Server scripts⌷

6. What features of your web server will you need to configure in order to process secure transactions of purchases of tennis balls?

Configure SSL (HTTPS), Obtain secure certificate from a CA

7. How would you arrange to have your content developers use a separate web server to develop new web pages without affecting the existing website?

Run a web server on a <u>different port</u> or use a <u>virtual host</u> to run another web site on the same server⌷

8. How will you keep track of how many people visit your website?

By looking at the <u>access log</u> entries or using <u>Google Analytics</u>
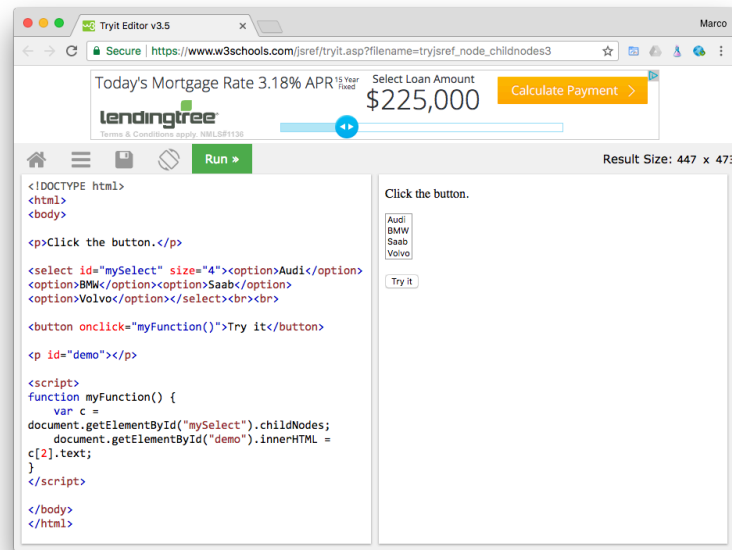
9. Who creates an ETag, a web browser of a web server?

Web Server.⌷

10. Is the use of ETag recommended for a farm of Apache servers?

No

DOM QUESTIONS [10 PTS]

Q1. (3 points) Consider the following example from www.w3schools.com.

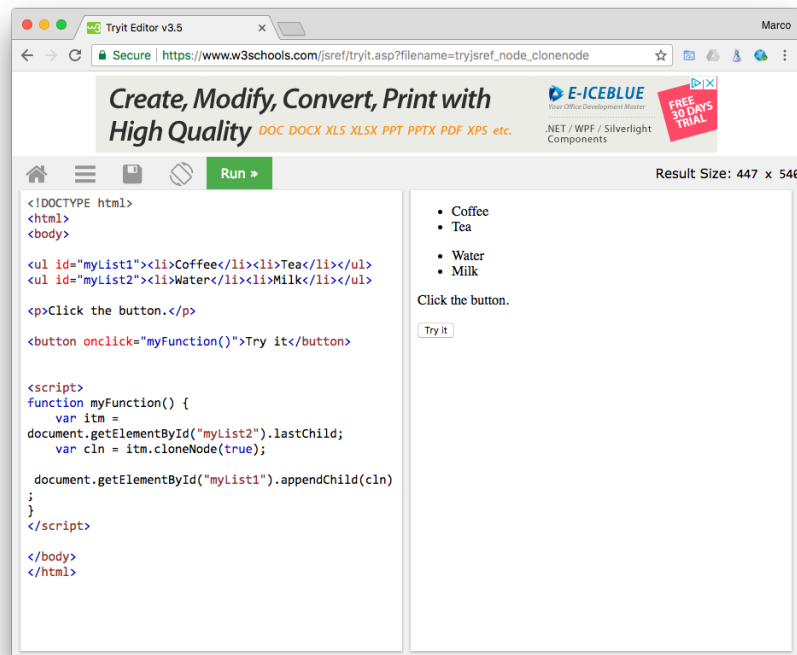The code is duplicated here:

```
<!DOCTYPE html>
<html>
<body>
<p>Click the button.</p>
<select id="mySelect"
size="4"><option>Audi</option><option>BMW</option><option>Saab</option>
<option>Volvo</option></select><br><br>
<button onclick="myFunction()">Try it</button>
<p id="demo"></p>
<script>
function myFunction() {
    var c = document.getElementById("mySelect").childNodes;
    document.getElementById("demo").innerHTML = c[2].text;
}
</script>
</body>
</html>
```

What happens when one clicks the "Try It" button?

A1. "Saab" is printed underneath the button.

Q2. (3 points) Consider the following example from www.w3schools.com.

The code is duplicated here:

```html
<!DOCTYPE html>
<html>
<body>
<ul id="myList1"><li>Coffee</li><li>Tea</li></ul>
<ul id="myList2"><li>Water</li><li>Milk</li></ul>
<p>Click the button.</p>
<button onclick="myFunction()">Try it</button>
<script>
function myFunction() {
    var itm = document.getElementById("myList2").lastChild;
    var cln = itm.cloneNode(true);
    document.getElementById("myList1").appendChild(cln);
}
</script>
</body>
</html>
```
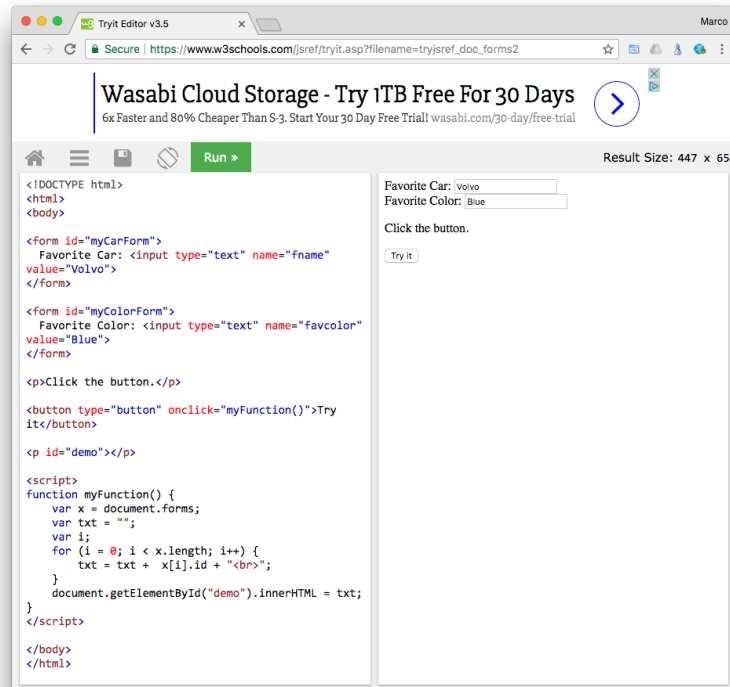
What happens when one clicks the "Try It" button?

A2. "Milk" item is cloned and copied below "Tea"

Q3. (4 points) Consider the following example from www.w3schools.com.

The code is duplicated here:

```html
<!DOCTYPE html>
<html>
<body>
<form id="myCarForm">
  Favorite Car: <input type="text" name="fname" value="Volvo">
</form>
<form id="myColorForm">
  Favorite Color: <input type="text" name="favcolor" value="Blue">
</form>
<p>Click the button.</p>
<button type="button" onclick="myFunction()">Try it</button>
<p id="demo"></p>
<script>
function myFunction() {
    var x = document.forms;
    var txt = "";
    var i;
    for (i = 0; i < x.length; i++) {
        txt = txt +  x[i].id + "<br>";
    }
    document.getElementById("demo").innerHTML = txt;
}
</script>
</body>
</html>
```

What happens when one clicks the "Try It" button?

17

A3. The two FORM ids are printed on separate lines below the button:

myCarForm
myColorForm