CSE 190 M, Summer 2011
Final Exam, Part 1 (LAB), version A
Thursday, August 18, 2011

Name: ____

TA / Section: ____

Student ID #: ____________________

Rules:

- You have **60 minutes** to complete this part of the exam.
  You may receive a deduction if you keep working after the instructor calls for papers.
- This test is open-book/notes. You may use any paper resources other than practice exams.
- You may *not* use any computing devices, including calculators, cell phones, or music players.
- Unless otherwise indicated, your code will be graded on proper behavior/output, not on style.
- Please do not abbreviate code, such as writing ditto marks ("") or ellipses (…).
- If you enter the room, you must turn in an exam and will not be permitted to leave without doing so.
- You must show your **Student ID** to a TA or instructor for your submitted exam to be accepted.

Good luck!

Problem	Description	Earned	Max
1	HTML/CSS Tracing		15
2	HTML/CSS Coding		15
3	JavaScript/DOM		20
TOTAL	**Day's Total Points**		**50**

Problem	Description	Earned	Max
4	?		15
5	?		15
6	?		20
TOTAL	**Day's Total Points**		**50**

TOTAL	**Exam Total Points**		**100**

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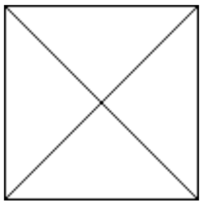
1. HTML/CSS Tracing

Draw a picture of how the following HTML and CSS code will look when the browser renders it on-screen. Assume that the HTML is wrapped in a valid full page with a `head` and `body`. Indicate a background coloring by shading lightly or by drawing repeated diagonal lines like this. If you can't clearly write *italic* text, underline it instead.

HTML:

```
<p class="pliny elder">
  I<br/>don't know about       you

but
  I'm going to the zoo but not
  today or to<br/>morrow
</p>

<ul id="pliny">
  <li>foo</li>
  <li><em>bar
      <img class="pliny younger"
           src="box.png" alt="x" /></em></li>
  <li>baz</li>  <li id="ninkasi">qux</li>
</ul>

<h1 id="firestone">Happy day!</h1>
```

`box.png` is a 100×100px image of a box with an 'X' through it:



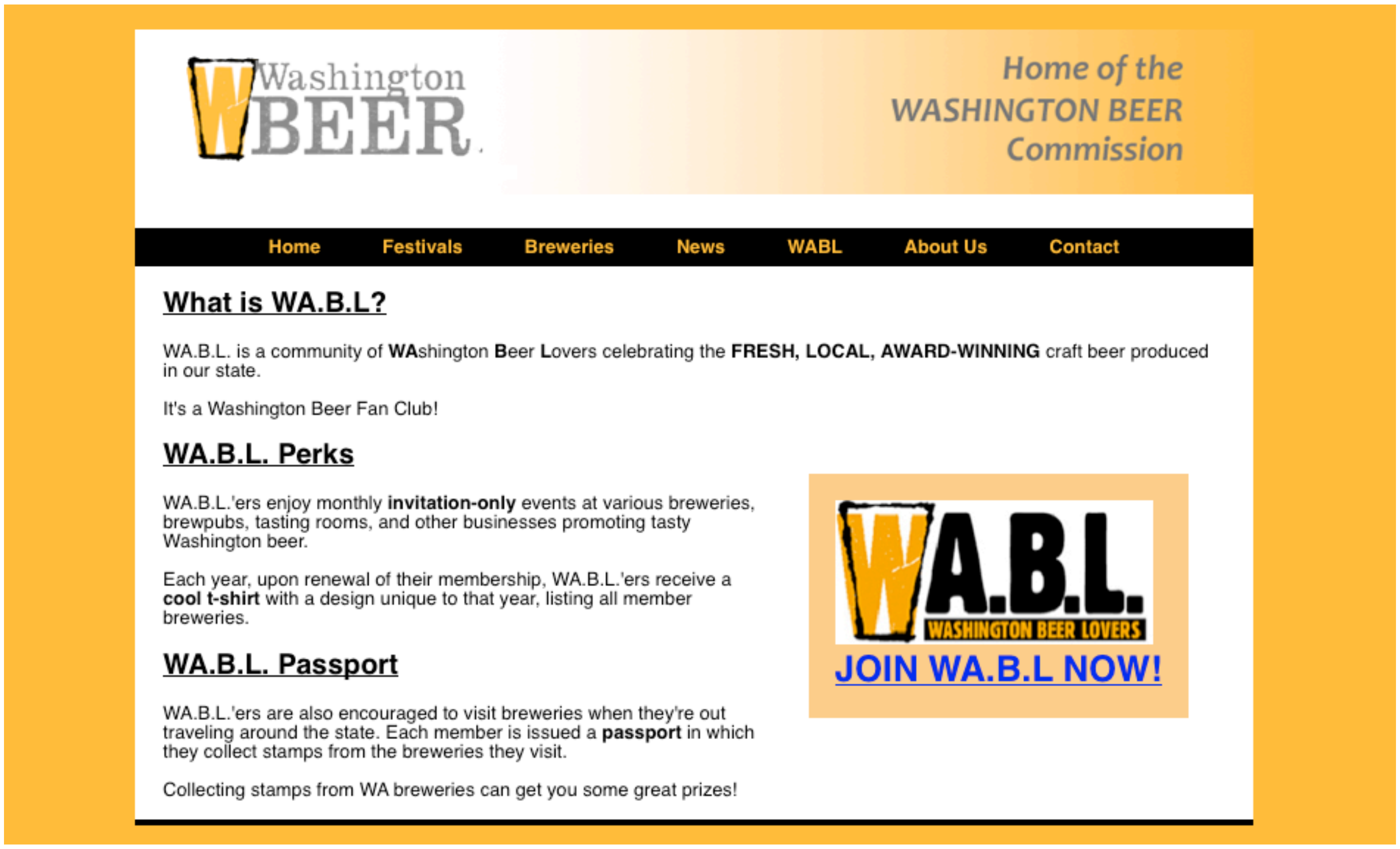
CSS:

```
h1, p, ul  { margin: 0; }
.pliny     { float: right;
             margin: 25px; }
#firestone,
#pliny     { padding-left: 1em; }
.elder, h1 { font-size: 200%; }
li         { display: inline; }
```

```
.elder { width: 200px;
         border: solid 2px black; }
#pliny { background-color: lightgray;
         border-bottom: dashed 2px black;
         height: 100px; }
#ninkasi,
.pliny.younger { display: block; }
```

2. HTML/CSS Coding

Write the XHTML and CSS code necessary to recreate the following appearance on-screen.
(Adapted from the WA.B.L page of the Washington Beer Commision website, washingtonbeer.com.)



Washington BEER

Home of the
WASHINGTON BEER
Commission

Home Festivals Breweries News WABL About Us Contact

What is WA.B.L?

WA.B.L. is a community of **WA**shington **B**eer **L**overs celebrating the **FRESH, LOCAL, AWARD-WINNING** craft beer produced in our state.

It's a Washington Beer Fan Club!

WA.B.L. Perks

WA.B.L.'ers enjoy monthly **invitation-only** events at various breweries, brewpubs, tasting rooms, and other businesses promoting tasty Washington beer.

Each year, upon renewal of their membership, WA.B.L.'ers receive a **cool t-shirt** with a design unique to that year, listing all member breweries.

WA.B.L. Passport

WA.B.L.'ers are also encouraged to visit breweries when they're out traveling around the state. Each member is issued a **passport** in which they collect stamps from the breweries they visit.

Collecting stamps from WA breweries can get you some great prizes!

WA.B.L. WASHINGTON BEER LOVERS

JOIN WA.B.L NOW!

Most of the XHTML code is given to you; the code given may not be modified. The only change you may make to the provided XHTML code is that you may add any number of **`div` and/or `span` elements**, possibly with `id` and/or `class` attributes, as targets for CSS styling. Write **valid code** that would pass the W3C validators. Assume that the given XHTML code would appear inside the `body` of the page.

- Text on the page uses a **sans-serif** font. The area around the outside of the page has a yellowish color of **#FFB131**.
- The overall central page area has a **white background**, and a **5px-thick solid black** border on its bottom edge only. It is **centered** within the page and is **950px** wide.
- The list of links appears **without bullets**, displayed all in **one line**, **centered** on the page. Each link's text is **bold**, **not underlined**, colored **#FFB131**, has a line height of **2em**, and has **1.5em** of horizontal spacing on either side of it. (Between two adjacent links there is a total of 3em space.)
- The main content area (beneath the navigation links) has **1.5em** of horizontal space on the left and right. All the headers inside of it are **underlined**.
- The "Join WA.B.L" section is located on the right side of the main content area, with text flowing around it. Its font size is **190%** of the font size of the rest of the page, and its background is colored **#FBC57B**. There is **.75em** of space separating its content from its edges, as well as **1em** of space separating its edges from the surrounding content.

All other appearance is unspecified, and is subject to the default rendering of the browser.

Mark up the text on the next page with your `div`/`span` tags. If a tag can't fit in the space provided, write it in the margins and draw an arrow to where it should be inserted.

Write your answer on the next page.

2. HTML/CSS Coding (writing space)

Mark up the **HTML code** below.

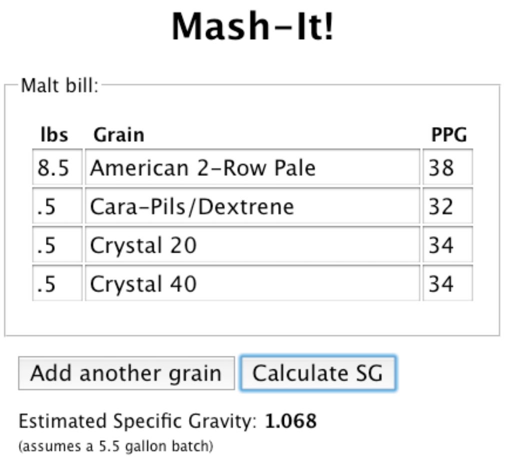
```
<h1><img src="header.gif" alt="Washington Beer - Home of the WASHINGTON BEER Commission" /></h1>


<ul><li><a href="">Home</a></li>          <li><a href="">Festivals</a></li>
    <li><a href="">Breweries</a></li>    <li><a href="">News</a></li>
    <li><a href="">WABL</a></li>         <li><a href="">About Us</a></li>
    <li><a href="">Contact</a></li></ul>


<h2>What is WA.B.L?</h2>
<p>WA.B.L. is a community of <strong>WA</strong>shington <strong>B</strong>eer ...</p>
<p>It's a Washington Beer Fan Club!</p>


<img src="wabl.jpg" alt="WA.B.L - Washington Beer Lovers" /><br/>
<a href="">JOIN WA.B.L NOW!</a>


<h2>WA.B.L. Perks</h2>
<p>WA.B.L.'ers enjoy monthly <strong>invitation-only</strong> events at various ...</p>
<p>Each year, upon renewal of their membership, WA.B.L.'ers receive a <strong>cool t-shirt</strong> ...</p>


<h2>WA.B.L. Passport</h2>
<p>WA.B.L.'ers are also encouraged to visit breweries when they're out traveling ...</p>
<p>Collecting stamps from WA breweries can get you some great prizes!</p>
```

Write your **CSS code** here. Put your CSS in two columns if you need more writing space, and/or use scratch paper.

3. JavaScript/DOM

Background: The first step in brewing beer is to extract sugars from grains by soaking the grains in hot water. This step is called *mashing*, and the resulting sugar-water is called *wort*. Each variety of grain contributes a different amount of sugar (the grain's *yield*) to the wort. Calculating the final amount of sugar in the wort is an important part of designing a beer recipe, since the sugars will later ferment into alcohol. To measure the amount of sugar in the wort we use *specific gravity* (SG), a decimal number (e.g., 1.054) which represents the ratio of the sugar-water's density to that of pure water (=1.000 SG). Specific gravity measurements during the brewing process are typically between about 1.010 and 1.100.

Your job is to write the **JavaScript code** to add behavior to the following page, which estimates the specific gravity of a list of user-entered grains:



Mash-It!

Malt bill:

lbs	Grain	PPG
8.5	American 2-Row Pale	38
.5	Cara-Pils/Dextrene	32
.5	Crystal 20	34
.5	Crystal 40	34

Estimated Specific Gravity: **1.068**
(assumes a 5.5 gallon batch)

HTML:

```
<h1>Mash-It!</h1>

<fieldset>
  <legend>Malt bill:</legend>

  <table id="malt_bill">
    <tr><th>lbs</th><th>Grain</th><th>PPG</th></tr>
    <tr>
      <td><input type="text" class="amount" /></td>
      <td><input type="text" class="name" /></td>
      <td><input type="text" class="yield" /></td>
    </tr>
    <!-- additional grain entry rows are added here -->
  </table>
</fieldset>

<div id="operations">
  <button id="add_grain">Add another grain</button>
  <button id="calculate">Calculate SG</button>
</div>

<div id="calculations">
  Estimated Specific Gravity:
    <span id="specific_gravity">
      <!-- your calculated SG goes here -->
    </span><br/>
  <span class="note">(assumes a 5.5 gallon batch)</span>
</div>
```

The page consists of a table in which the user can enter grains. Every time the **Add another grain** button is clicked, a new row should be added at the bottom of the table. Each row consists of three text-entry fields, each in its own table cell, for entering the following values: an **amount** (in pounds), a **name**, and a sugar **yield** (in "PPG"). These entry fields should have the classes `amount`, `name`, and `yield` respectively.

When the **Calculate SG** button is pressed, your code should estimate the specific gravity of the user-entered grains by performing the following calculation:

$$SG_{est} = \text{round}([a_1 y_1 + a_2 y_2 + \cdots + a_n y_n] \ / \ 5.5) \ / \ 1000 + 1$$

(Where a_1 and y_1 represent the amount and yield of the first grain, and so on.)

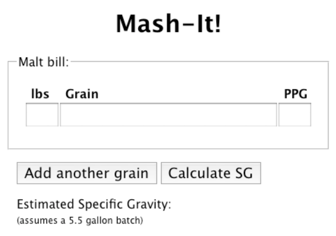
In other words, for each grain in the list, multiply its **amount** (the number in the "lbs" column) by its **yield** (the number in the "PPG" column), and take the sum of these products. Then divide that by 5.5 (which represents the volume of water it's dissolved in, in gallons). Round the result to the nearest integer, then to express it as a number 1 followed by 3 decimal places (e.g., 1.054), divide by 1000 and add 1.

For example, using the values in the above screenshot, your calculation would be as follows:

$$SG_{est} = \text{round}([8.5 \cdot 38 \ + \ .5 \cdot 32 \ + \ .5 \cdot 34 \ + \ .5 \cdot 34] \ / \ 5.5) \ / \ 1000 + 1 = 1.068$$

You should **assume all input to text boxes is valid**; that is, reasonable values will always be entered in the fields for amount and yield. You may assume the **Prototype** JavaScript library is loaded prior to your script being loaded. When injecting content into the page, you may use the `innerHTML` property for injecting **plain text only**; you **may not** use it to inject any HTML code.

These screenshots show various states of the program being used:



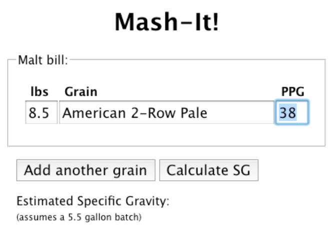
Mash-It!

Malt bill:

lbs	Grain	PPG

Estimated Specific Gravity:
(assumes a 5.5 gallon batch)

Initial state



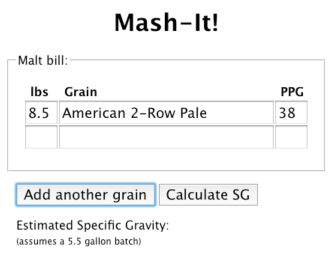
Mash-It!

Malt bill:

lbs	Grain	PPG
8.5	American 2-Row Pale	38

Estimated Specific Gravity:
(assumes a 5.5 gallon batch)

After the first grain has been entered



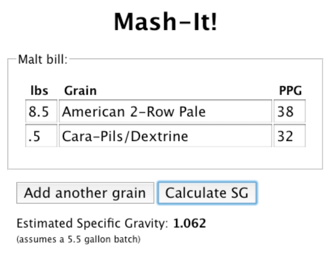
Mash-It!

Malt bill:

lbs	Grain	PPG
8.5	American 2-Row Pale	38

Estimated Specific Gravity:
(assumes a 5.5 gallon batch)

After **Add another grain** has been clicked



Mash-It!

Malt bill:

lbs	Grain	PPG
8.5	American 2-Row Pale	38
.5	Cara-Pils/Dextrine	32

Estimated Specific Gravity: **1.062**
(assumes a 5.5 gallon batch)

After another grain has been entered, and **Calculate SG** has been clicked

(Write your solution below.)

3. JavaScript/DOM (writing space)

3. JavaScript/DOM (additional writing space)