CS110 Review Questions

This is *not* a "practice test." It is much longer than the test will be and covers more material. Some of the questions may be harder or more time-consuming than the test questions. Furthermore, this is not exhaustive: there may be kinds of questions on the test that are not exhibited here. Therefore, you should not study *only* by doing these questions. These questions are here for you to think about and to trigger your own thoughtful inquiry into the material.

Review your own notes, the lecture and lab notes, and the textbook reading in an inquisitive way: not only "do I understand this," but "can I explain it," and "can I use it," and even "what little bits of syntax are tricky here." Consider compiling your own summary of reference material, concepts and so forth.

Work through problems on your own without reference to the course material to test whether you actually understand it. While the test is open book and open notes, there will not be time to learn a technique or look up things on every problem and finish in 70 minutes.

Vocabulary

1. The _____ image format tends to be good for drawn graphics and animations, but the _____ format is better for photos.

2. A piece of text that the code can remember inside a variable or concatenate with other pieces of text is called a(n) _____

3. A hyperlink like `<a href="fred.gif">` is an example of a(n) _____ URL.

4. A hyperlink like `<a href="http://www.yahoo.com/home.html">` is an example of a(n) _____ URL.

5. The information put in front of a curly brace in a CSS rule is called a(n) _____.

True/False

1. _____ JavaScript can use either single or double quotes around its strings.

2. _____ A GIF with 33 colors requires a bit-depth of 6.

3. _____ It is *not* possible to show images on a web page without the `<img>` tag.

Short Answer

For questions with numerical answers, show how you arrived at your answer and mark the answer clearly. For other questions, write 2–3 clear, concise, complete English sentences. Your answer will be graded 50% for correctness and 50% for quality of explanation.

1. How many bytes does it take to represent a 100x100 image with 3 colors, assuming you represent each pixel with some bits that refer to a color palette? Also calculate how many bytes are in the color palette. (Ignore the bytes that would be necessary to specify the width and height of the image at the beginning of the file. Assume 24-bit color.)

2. What decimal number does binary number 11111111 represent?

3. What decimal number does hexadecimal number AB represent?

4. Convert 75 to binary and to hexadecimal.

5. Consider 11_{10} and 11_2 (both decimal and binary). Which of the two is larger?

6. Each row of the following table shows how the number for that row can be written in different bases. The first row is an example. Your task is to fill in the missing entries for the other rows. Show your work.

Decimal (base10)	Binary (base 2)	Hexadecimal (base 16)
110	01101110	6E
255		
	10000001	
		2E

7. How would "Is it $99?" be represented in ASCII? Don't represent the quotation marks. Here's a slightly modified form of the ASCII table you saw in class and in the reading:

	0	1	2	3	4	5	6	7
32	SPC	!	"	#	$	% /	&	'
40	(	)	*	+	,	-	.	/
48	0	1	2	3	4	5	6	7
56	8	9	:	;	<	=	>	?
64	@	A	B	C	D	E	F	G
72	H	I	J	K	L	M	N	O
80	P	Q	R	S	T	U	V	W
88	X	Y	Z	[	\	]	^	_
96	`	a	b	c	d	e	f	g
104	h	i	j	k	l	m	n	o
112	p	q	r	s	t	u	v	w
120	x	y	z	{			}	~	DEL

8. What part of the computer performs arithmetic operations and decides which instructions to execute next?

9. Where are the bits that represent programs stored on the computer when the programs are not running?

10. For each English description in the left column, draw a line to the CSS color specification in the right column that best matches the English description. Since there are more color specifications than English descriptions, some color specifications will be unused.

CSS Color Specification

- `#221009`
- `#FFB6C1`
- `#F32ED1`
- `#02EE14`
- `#F3E21D`
- `rgb(255,0,0)`
- `rgb(1,9,97)`
- `rgb(1%,9%,97%)`

English Description

greenish •

purplish •

pink •

bright blue •

dark blue •

11. You're picking colors for a web site. Your client likes dark violet (#9400D3) and plum (#DDA0DD), and asks you to find a color that is "right in between." What color would you offer? Show your computations.

12. Which of these two colors is *lighter*: aliceblue (#F0F8FF) or cornflowerblue (#6495ED)?

Relative URLs

This section tests your understanding of the syntax of relative URLs, which are incredibly useful when designing all but the smallest of web sites.

You're creating a music web site with the following folder and file structure:

```
music/
    index.html
    format/
        cd-used.html
        cd-new.html
    genre/
        rock/
            classic/
                doors.html
                stones.html
            punk/
                ramones.html
                sex-pistols.html
        rap/
            icecube.html
            DMX.html
```

Give the relative URL for each of the following connections:

- From `cd-used.html` to `stones.html`

- From `icecube.html` to `ramones.html`

- From `doors.html` to `stones.html`

- From `index.html` to `DMX.html`

HTML

Write the complete HTML and CSS to produce this web page:

The image of this star comes from the following URL:

```
http://cs.wellesley.edu/~cs110/lectures/M02-fireworks/star1.gif
```

The image of the question mark comes from a local file, named `questionMark.png`.

Issues to consider:

- the right URLs for the star and the question mark image

- how to center headers, images, and lines of paragraphs

- how to control the size of the text in the header and to bump it up for a few words

- how to get the horizonal line across the page, above the word "–traditional"

- how to get the word "–traditional" to be positioned where it is.

CSS

Write the code that would go into your CSS file to solve each of the following problems. You need not set values for attributes that are not immediately relevant to the problem. When classes and ids are used, write out the tag name too.

1. You told two images to float left, but instead of going all the way to the left side of the screen, the lower one seems to be bumping against the lower right corner of the upper image. (Assume the "float" and display type is set elsewhere.)

2. You'd like text within paragraphs of class "answer" to be black against black, so that people can only see the text when they highlight it. (Black on black is sufficient for this effect.)

3. You'd like the background color of a section containing a floating image to extend beyond the containing text so that the image doesn't stick out.

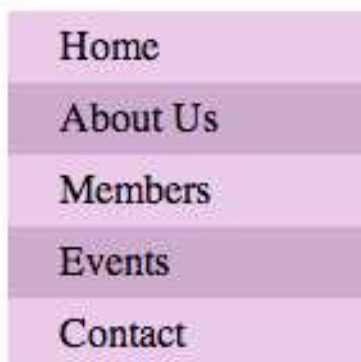Here are some slightly more lengthy CSS questions.

1. Suppose that you're writing a web site for an online store. In addition to its thousands of regular offerings, it occasionally has sale items, often dozens at a time. To make the sale items stand out, your boss says that they should be written in a bold font in lime green. How do you solve this problem? Briefly explain your design decisions.

2. For a website for a newspaper, you decide to mimic the look of a newspaper and have the content of the site in columns, but just three columns each 2 inches wide. How would you do this?

3. It turns out that HTML has a special code to produce a bullet, namely `•`. So, one could do a bullet list as follows:

   ```
   <p>Here is a list of items:
   <p style="margin-left: 3em">&bull; apples
   <p style="margin-left: 3em">&bull; bananas
   <p style="margin-left: 3em">&bull; dates
   ```

   The result can be indistiguishable from conventional bullet lists. Indeed, many GUI programs for creating web sites do exactly this. What advantages or disadvantages does this have compared to conventional bullet lists?
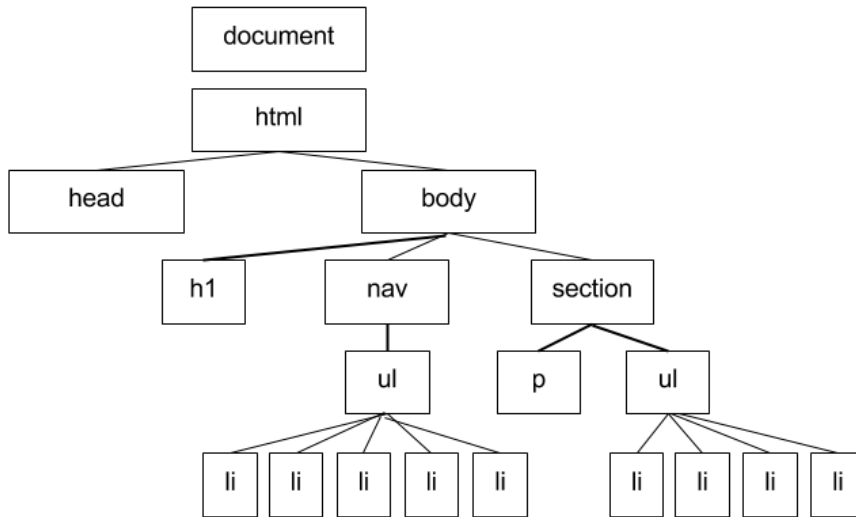
4. You are given a screenshot of how the document is rendered by the browser (see picture below) as well as the DOM tree of representing its HTML (next picture). Write the CSS rules that were used to style the page. The exact values in pixels (or the colors) are not important. A correct solution will have a rule for every styled element using the proper selector. Every rule contains the needed properties that will receive some reasonable value. Explain with words the role that each rule plays in the page appearance. Note: there are no ID or CLASS attributes in the HTML document

JavaScript

1. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
   var x = 7;
   var y = 5;
   var z = 14;
   x = y;
   z = z % x;
   alert(y + z);
</script>
```

2. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
   var a = 1;
   a = a + 1;
   var b = "a is " + a;
   a = 5;
   alert(b);
</script>
```

3. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
   var a = prompt("enter a number","31");
   var b = a + 5;
   var c = "b is " + b;
```

```
    alert(c);
</script>
```

4. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
   var name = prompt("enter your name","Harry Potter");
   if( name = "Hermione Granger" ) {
      alert("A special hello to you, Hermione!");
   } else {
      alert("Hello, "+name);
   }
</script>
```

5. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
   var name = prompt("enter your name",
                     "Albus Percival Wolfric Brian Dumbledore");
   if( name > 20 ) {
      alert("Wow, that's quite a mouthful!");
   }
</script>
```

6. What is the result of the following code? Correct any errors.

```
<script type="text/JavaScript">
var sales = parseInt(prompt("What were your sales this quarter?",
                            "10000"));
var msg;
if( sales > 24000 ) {
   msg = "you deserver a raise.";
}
if( sales > 10000 ) {
   msg = "well done; keep it up.";
}
if( sales > 5000 ) {
   msg = "umm, step it up or else ...";
}
alert(msg);
</script>
```