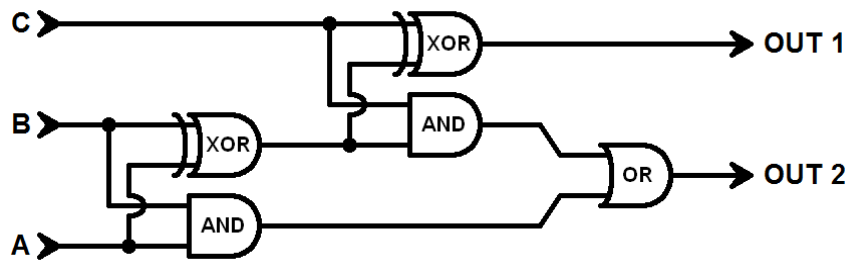


**CMPSCI 105 Midterm Exam  
Spring 2016  
March 3, 2016  
Professor William T. Verts  
Solution Key**

<1> 15 Points – (1 point each) – Fill in your answer into the box at the left side of each question. Show your work on the back of a page if you want us to consider partial credit. **Pick any 15 problems.** For extra credit, you may do more than 15. **Blank or incorrect answers will be ignored.**

<b>False</b>	1. True or False: A 3½-inch diskette is a “hard disk”.
<b>False</b>	2. True or False: A USB flash drive is a “hard disk”.
<b>6</b>	3. What power of 2 gives me 64? $\log_2(64) = 6$ means the same as $2^6=64$
<b>8</b>	4. How many bits are necessary to represent all unsigned integers from 0 up through and including 255?
<b>127</b>	5. In the HTML color <b>#F37FD0</b> , what is the decimal (base 10) value for green? <b>Green = 7F = <math>7 \times 16^1 + F \times 16^0 = 112 + 15 = 127</math>.</b>
<b>Yes</b>	6. Is the HTML color named <b>Fuchsia</b> a <i>browser safe</i> color? <b>Fuchsia=#FF00FF, all from [00, 33, 66, 99, CC, FF]</b>
<b>#789</b>	7. What is the <i>short hex</i> code for the HTML color <b>LightSlateGray</b> ? ( <b>Browser Defined Colors=#778899</b> )
<b>3</b>	8. The logarithm base 3 of 14 is 2.40217350. When converting the number 14 to base 3, <i>how many digits</i> will be required?
<b>750</b>	9. What is the <i>octal</i> (base 8) value of the UNIX file permissions code <b>rwxr-x---</b> ? ( <b>from chmod table</b> )
<b>EL926szj</b>	10. Sam Jones has a username of <b>szjones</b> and a SPIRE ID of <b>31415926</b> . What is his initial password on <b>elsrv3</b> ?
<b>10240</b>	11. How many bytes are in a file of 10 kilobytes? <b>Prefix “Kilo-” means 1024 when referencing memory. <math>10 \times 1024 = 10240</math></b>
<b>&amp;#233; &amp;eacute;</b>	12. There are two ways of representing the symbol <b>é</b> in HTML. Write down either one of them. ( <b>from HTML Entities table</b> )
<b>Tuvalu</b>	13. A Web address has <b>.tv</b> at the end. What does this mean? ( <b>from Top-Level Country Codes table</b> )
<b>1010111</b>	14. Convert the decimal number 87 into binary. <b><math>87 \div 2 = 43R1</math>, <math>43 \div 2 = 21R1</math>, <math>21 \div 2 = 10R1</math>, <math>10 \div 2 = 5R0</math>, <math>5 \div 2 = 2R1</math>, <math>2 \div 2 = 1R0</math>, <math>1 \div 2 = 0R1</math>.</b>
<b>1100</b>	15. What is the <i>binary sum</i> of binary numbers 1001 and 0011?
<b>63</b>	16. What is the <i>largest signed integer</i> that will fit into 7 bits? <b>All N-Bit Signed numbers have range <math>-2^{N-1} \dots +2^{N-1}-1</math></b>
<b>18-6i</b>	17. What is the product of complex numbers $(4+2i)$ and $(3-3i)$ ? <b>FOIL: <math>4 \times 3 = 12</math>, <math>4 \times -3i = -12i</math>, <math>2i \times 3 = 6i</math>, <math>2i \times -3i = -6i^2 = +6</math></b>
<b>Paris</b>	18. If it is 6:00pm here in Massachusetts, should I download a large file from a mirror in Paris or from one in Denver?
<b>Yes</b>	19. Can I run a telnet session, an ftp session, and a Web browser over the same link to the Internet at the same time?
<b>Yes</b>	20. Can I log in to the same UNIX account with both an encrypted telnet and an encrypted ftp at the same time?

<2> 8 Points – Trace the following gate circuit and show its output for all combinations of input values. (½ point each answer)



In			Out 2	Out 1
A	B	C		
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

<3> 5 Points – Short Answer – After using PuTTY on a PC (in ssh mode) or use ssh on a Mac (in the Terminal program) to log in to the **elsrv3** server, I immediately attempt to edit the existing **index.html** file with **emacs**, but the editor shows an empty file. Why?

The **index.html** file is located down in the **public\_html** folder. Since I started emacs immediately, without first opening **public\_html**, I am asking **emacs** to edit a file that doesn't exist in the current folder. Since the file doesn't exist where I am looking, **emacs** assumes that this is a new file, and shows me a blank editing window.

For grading purposes, as long as the answer speaks to the problem of **emacs** looking in the wrong folder, give full credit. Give 2 points credit for any partially correct answer, and 0 points for any answer that is completely wrong.

<4> 7 Points – A UNIX file named **lizard.jpg** currently has permissions **r--r-----**, but I want them to be **rw-rw-r--** instead. Using only the *symbolic* form of **chmod**, what UNIX command would I type in to affect this change?

**chmod ug+w,o+r lizard.jpg -or- chmod a+r,ug+w lizard.jpg**

1 point for including the **chmod** command.

2 points for including the **lizard.jpg** file name.

4 points for any valid symbolic pattern that accomplishes the desired task; remove 1 point per error (but give only 1 point total for this section for using the absolute numeric form of the permissions: **664**)

- <5> 5 Points – Short Answer – I’ve told you this semester that the **elsrv3** server is a computer located in the COMPSCI building on the north end of the UMass campus. Suppose that I’ve been lying to you all along, and the actual physical location of the server was in a roadside diner named “Jake’s Drive-In” on Interstate 80 in Nebraska. Would it matter to you whether or not I lied as far as the solution of our assignments is concerned? Why or why not?

**No, it does not matter.** Since we connect to the server over the Internet, all of our communications go through a number of computers anyway; more or fewer computers along the path does not affect our ability to communicate (except there is a slight time increase if the machines are farther away).

For grading: 2 points for saying “No”, and 3 points for any reasonable explanation that involves communicating over the Internet. Give +1 point extra credit if they mention the increase in time.

- <6> 10 Points – Here is a table that I want to create in HTML:

Animals		
Birds	Mammals	Fish
Lizards	Amphibians	Insects

This is my first attempt at writing the HTML, but the fragment below is full of errors, both in syntax and in content. Correct all the mistakes.

```

<TABLE BORDER>
  <TR>
    <TD COLSPAN="3" ALIGN="Center>Animals</TD>
  </TR>
  <TR>
    <TD>BugsBirds</TD>
    <TD>Mammals</TD>
    <TD>Fish</TD>
  </TR>
  <TR>
    <TD>Lizards<TD>
    <TD>Amphibians</TRD>
    <TD>Insects</TD>
  </TR>
</TABLE>

```

(No **A** in **BORDER**)

= " (- should be =, missing final quote on "Center")

(missing <TR> tag)

(Bugs should be Birds)

(missing </TR> tag)

(</TR> should be </TD>)

(missing /)

(missing < and >)

Remove 1 point per missed error. Remove ½ point for anything misidentified as an error, but do not go below zero points. Ignore any irrelevant new HTML code.

- <7> 5 Points – In the address for the class site listed below, identify the protocol, the host address, the username, the folder path, and the resource:

`http://people.cs.umass.edu/~verts/coins105/coins105.html`

1 Point per answer.

Protocol: `http://`

Host Address: `people.cs.umass.edu`

Username: `~verts`

Folder Path: `/coins105`

Resource: `coins105.html`

- <8> 5 Points – Short Answer – Many students, in attempting to log in to the server, got an error message saying either “Connection reset by peer” or “ssh-exchange-identification” or “Server unexpectedly closed connection”. What has happened here?

This is an indication that the server has detected an abnormal number of **failed log-in attempts**, and is now **blocking the IP address** of the user’s computer.

Accept for full credit anything reasonable that discusses the server blocking the computer. Assign 2 points for any partial answer. Assign 0 points for any completely incorrect answer.

- <9> 10 Points – Write an HTML fragment (not a complete Web page) that links to the Web page `http://www.starwars.com/` when clicking on the graphic image named **StarWars.jpg** (the alternate text for the image must be **Image goes here** and the fly-over title must be **Use the force, Luke**).

```
<A HREF="http://www.starwars.com/">
  <IMG SRC="StarWars.jpg"
    ALT="Image goes here"
    TITLE="Use the force, Luke">
</A>
```

Assign points as follows:

1 Point for any and all syntax errors.

1 Point for `<A HREF="____">`

1 Point for `http://www.starwars.com/`

1 Point for `<IMG SRC="____">`

1 Point for `StarWars.jpg`

1 Point for `ALT="____"`

1 Point for `Image goes here`

1 Point for `TITLE="____"`

1 Point for `Use the force, Luke`

1 Point for `</A>`

No penalty for poor indentation; no penalty for including **WIDTH** or **HEIGHT** in **IMG**.

- <10> 10 Points – In the **STYLE** block of my Web page, I want the following definitions:
1. The background color of the **BODY** of the page should be yellow,
  2. All **P** paragraphs should be fully justified,
  3. All **H1** headings should be in the Arial typeface,
  4. All **H2** headings should be green.

Fill in the **STYLE** block below to set this up:

```
<STYLE TYPE="text/css">  
  
    BODY {background-color:yellow}  
  
    P {text-align:justify}  
  
    H1 {font-family:Arial}  
  
    H2 {color:green}  
  
</STYLE>
```

Order of lines is arbitrary (may be in any order).

Tag names (**BODY**, **P**, **H1**, **H2**) may be in lower-case (**body**, **p**, **h1**, **h2**), but attribute names and values must be capitalized as shown.

Colors may be named (as shown), as hexadecimal, as short-hex, or any equivalent form, as appropriate. For example:

```
yellow = #FFFF00 = #FF0 = rgb(255,255,0) = rgb(100%,100%,0%)  
green  = #008000 = rgb(0,128,0) = rgb(0%,50%,0%)
```

The font name is allowed but not required to have quotes in this case (quotes would be required only if the name contained a blank):

```
Arial = 'Arial'
```

Assign 2½ points per answer. In each case, assign 1 point for the basic structure **TAGNAME** { \_\_\_ }, 1 point for the expected content, and ½ point for syntax.

<11> 5 Points – Examine the picture to the right for the following questions.

1. The letters are each around 144 points high. How many inches is that?

**2 inches** (from 72 points/inch)

Score as 2 points.

2. On the picture, indicate by circling all places where **kerning** can be **strongly** applied.

**TA and AY in STAY,  
WA and AT in WATCH**



Score as 2 points, ½ point per answer. Allow the OW and TC pairs, but no credit for or against these answers.

3. Does the typeface have serifs, or is it sans-serif?

**Sans-serif** (score as 1 point)

<12> 5 Points – In Microsoft Word, I create a style definition that is stored only in the current document, and is not available to any other Word documents. Is this equivalent in HTML to the **STYLE="\_\_\_\_\_"** attribute in a tag, the **<STYLE TYPE="text/css">** block, or an external **.css** file?

This is closest in form to the **<STYLE TYPE="text/css">** block, as these are styles stored in and available to all elements of the current HTML document (not in an external CSS file) that affect the entire document (and not just a single element).

5 points, all or nothing. Students may simply circle the correct answer, or may write about it; as long as they indicate which one is correct they get full credit.

<13> 10 Points – Short Answer – How are text characters as defined on a modern computer similar to **.SVG** files? What graphics design tool is common to both?

(3 points) Text characters are **scalable**, as are the graphics in an **.SVG** file.

(2 points) The design tool common to both is the **Bézier curve**.