

SI110 – Introduction to Cyber Security Technical Foundations

Fall AY2012 – Six Week Exam

Individual work.
Closed book. Closed notes.
You may not use any electronic device.

Your answers must be legible to receive credit.

On the front of every sheet, legibly write your

_____, _____, _____
Name Alpha code Section Number

There are 23 questions on 8 pages.
Each problem is worth 5 points (115 total points).

ASCII Table for Printable Characters																										
Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char			
32	20		43	2b	+	54	36	6	65	41	A	76	4c	L	87	57	W	98	62	b	109	6d	m	120	78	x
33	21	!	44	2c	,	55	37	7	66	42	B	77	4d	M	88	58	X	99	63	c	110	6e	n	121	79	y
34	22	"	45	2d	-	56	38	8	67	43	C	78	4e	N	89	59	Y	100	64	d	111	6f	o	122	7a	z
35	23	#	46	2e	.	57	39	9	68	44	D	79	4f	O	90	5a	Z	101	65	e	112	70	p	123	7b	{
36	24	\$	47	2f	/	58	3a	:	69	45	E	80	50	P	91	5b	[	102	66	f	113	71	q	124	7c	|
37	25	%	48	30	0	59	3b	;	70	46	F	81	51	Q	92	5c	\	103	67	g	114	72	r	125	7d	}
38	26	&	49	31	1	60	3c	<	71	47	G	82	52	R	93	5d	]	104	68	h	115	73	s	126	7e	~
39	27	'	50	32	2	61	3d	=	72	48	H	83	53	S	94	5e	^	105	69	i	116	74	t			
40	28	(	51	33	3	62	3e	>	73	49	I	84	54	T	95	5f	_	106	6a	j	117	75	u			
41	29	)	52	34	4	63	3f	?	74	4a	J	85	55	U	96	60	`	107	6b	k	118	76	v			
42	2a	*	53	35	5	64	40	@	75	4b	K	86	56	V	97	61	a	108	6c	l	119	77	w			

hex digit	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
4-bit pattern	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

A. Digital Data

1. (a) **Write** the decimal number represented by the binary number 101010,
(b) ... and **show** how it is derived.

2. (a) **Write** the binary representation of the decimal number 23,
(b) ... and **show** how it is derived.

3. A file consists of three bytes having these decimal values: *1st byte is 89, 2nd byte is 101, 3rd byte is 115*. **Write** below how this data would appear if the file was opened in Notepad:

4. "A file on my computer named foo.jpg is definitely an image file."

(a) Is the quoted statement true or false? **Circle** one: T / F

(b) **Explain** your answer to (a), below.

5. We can specify a color in HTML as three bytes written in hex (an "RGB triple"). **Circle** every string below that is a valid HTML color specified this way.

Note: 0 = zero

d421k8 237508 a8001b y0h0h0 faf f30d

B. Architecture

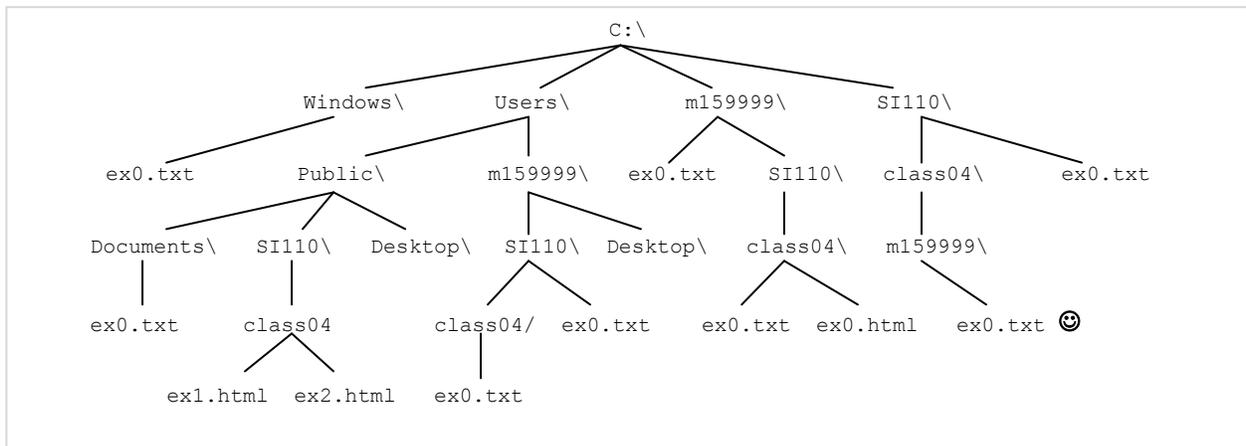
1. Approximately how much RAM is on your laptop? **Circle** the closest answer.

- (a) 4 kilobytes
- (b) 4 megabytes
- (c) 4 gigabytes
- (d) 4 terabytes

2. A process executes by the CPU going through the fetch-decode-execute cycle, fetching instructions from RAM. Where did the instructions come from in the first place?

C. Operating Systems

The next three questions refer to the filesystem shown in this diagram:



1. **Draw** a circle around the folder or file named by

C:\m159999\SI110\class04\ex0.txt

2. **Write** the full absolute pathname for the folder or file marked by ☺ :

3. Assume the current folder is **C:\Users\m159999\Desktop**
Assume you execute the command **cd ..**

Draw a rectangular box around the folder you will then be in.

D. Programming I

1. What is the value of the variable b after the following snippet of code has been executed:

```
var a = 5;  
var b = 1 + 2 * a;  
b = b + 1;
```

Answer:

2. What is the value of the variable b after the following snippet of code has been executed:

```
var a = 5;  
var b = "go" + a;
```

Answer:

3. What are the values of each the following:

(a) `typeof("hello")`

(b) `typeof(14)`

(c) `typeof("hello" + 14)`

(d) `typeof("14")`

(e) `typeof(true)`

E. Programming II

1. **Modify** the following program so that the aspect ratio is input by the user (i.e. not hard-coded to be 40).

```
var wheelDiameter = 17;  
  
var aspectRatio = 40;  
  
var sectionWidth = 215;  
  
var tireHeight = wheelDiameter + 2*(sectionWidth/25.4)*(aspectRatio/100);
```

F. Programming III & IV

1. Suppose a store has an item you want. It costs \$315 today, but the store reduces the item's price by 5% each day. The following program computes how many days it will take before the item reaches a target cost of \$200.

Modify the program so that the target cost is input by the user rather than hard-coded to be \$200.

```

var cost = 315;

var dailyReduction = 5;

var dayCount = 0;

while( cost > 200 )
{
    cost = cost - cost*dailyReduction/100;

    dayCount = dayCount + 1;
}

alert( "It will take " + dayCount + " days!" );

```

G. Programming V

1. Each snippet a, b, c below has 2 lines of code. Treat each snippet separately. **Write** the value of the variable res for each snippet.

```
// Snippet (a)
var s = "rain song";
var res = s[2];
```

```
// Snippet (b)
var s = "rain song";
var res = s.length;
```

```
// Snippet (c)
var s = "rain song";
var res = s[s.length-1];
```

2. Consider the following program:

```

var sin = "I love SI110!"
var sout = "";
var count = 0;
while(count < sin.length)
{
    var nextChar = sin[count];
    if (nextChar == " ")
    {
        sout = sout + "+";
    }
    else
    {
        sout = sout + nextChar;
    }
    count = count + 1;
}
alert(sout);

```

What will this program display as its output?

Answer:

H. Web Intro & Build-a-web-page Lab

1. Consider the following URL: **http://intranet.usna.edu/Schedules/text/pod.pdf**

(a) The *protocol* part is?

(b) The *server* part is?

(c) The *filesystem path* part is?

2. Suppose you enter the URL **http://rona.cs.usna.edu/~sil10/calendar.html** in your browser's address bar. **Circle** the correct word "client" or "server" in **each** underlined section below so that the text accurately describes what happens.

i. The web client / server connects to the web client / server rona.cs.usna.edu and asks for the file ~sil10/calendar.html.

ii. Then the web client / server finds the file on its harddrive and then sends it back to the web client / server .

iii. Then the web client / server renders the file it receives.

3. Suppose this scenario: I visit a remote website using a browser on my laptop, after which I take my laptop and utterly destroy it in a blast furnace. "Now there is no record of my ever having visited the website."

(a) Is the quoted statement true or false? **Circle** one: T / F

(b) **Explain** your answer to (a), below:

4. **Draw** how this HTML would be rendered by a browser:

Answer:

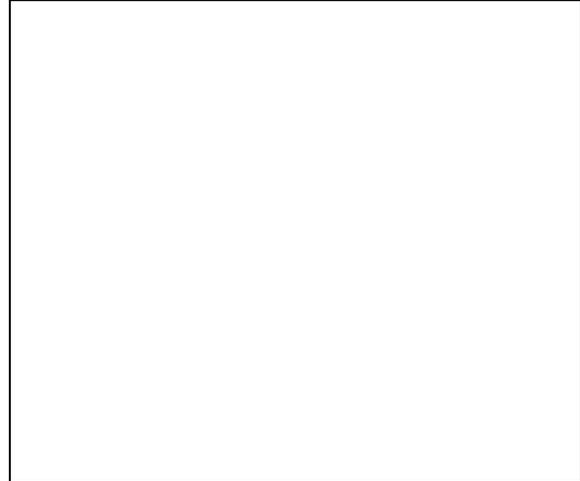
```
<html>
  <head> </head>
  <body>
    <p>life</p> <p>is</p> <p>good</p>
  </body>
</html>
```

I. Client-side Scripting (non-event driven)

1. **Draw** how this HTML would be rendered by a browser:

Answer:

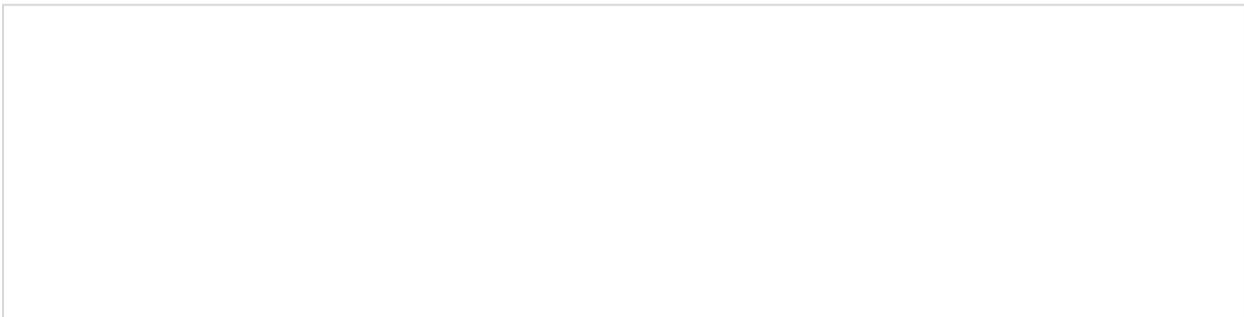
```
<html>
  <head> </head>
  <body>
    Hello
    <script type="text/javascript">
      var count = 0;
      while(count < 3)
      {
        document.write("<p>X</p>");
        count = count + 1;
      }
    </script>
    World!
  </body>
</html>
```



2. **Describe** what people see when they visit this webpage. Recall that `Math.random()` returns a random number in the interval $[0, 1)$, i.e., greater than or equal to zero, but less than 1.

```
<html>
  <head> </head>
  <body>
    <script type="text/javascript">
      if (Math.random() < 0.5)
      {
        document.location = "http://www.usma.edu";
      }
    </script>
    Glad you made it!
  </body>
</html>
```

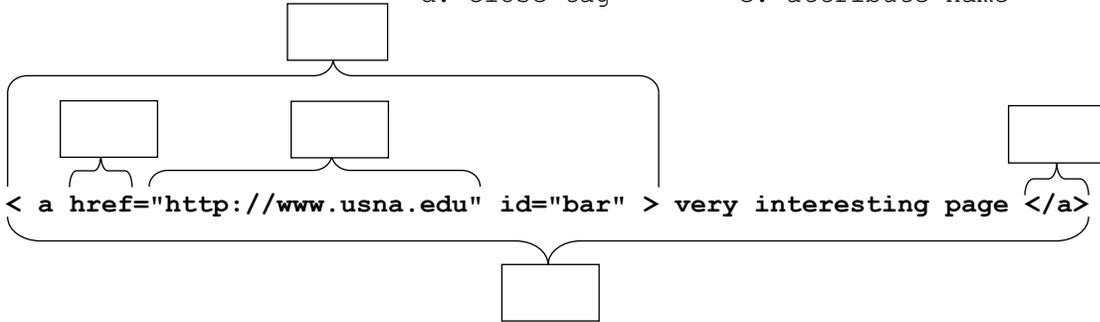
Answer:



J. Client-side Scripting (event driven)

1. Name the parts of this HTML. Each curly brace should be **labeled** with letter(s) taken from the following list:

- a. attribute value
- b. element
- c. start tag
- d. close tag
- e. attribute name



2. Consider the following HTML for a simple webpage

```
<html>
  <head> </head>
  <body>
    <span onclick="document.getElementById('foo').innerHTML='gold'"> change </span>
    <span id="foo"> blue </span>
  </body>
</html>
```

a. **Draw** what appears on this webpage when it is first rendered?

b. What happens if the user clicks on the word "blue" in the browser, for this webpage?

c. What happens if the user clicks on the word "change" in the browser, for this webpage?