

SI110 – Introduction to Cyber Security Technical Foundations

Spring 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

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

File Type	Header (Hex)	Header (ASCII)
png	89 50 4e 47	.PNG
jpg	FF D8 FF E0	ÿØÿà
bmp	42 4D	BM
avi	52 49 46 46 xx xx xx xx 41 56 49 20 4C 49 53 54	RIFF.... AVI LIST
mpg (video)	00 00 01 Bx	....
wav	52 49 46 46 xx xx xx xx 57 41 56 45 66 6D 74 20	RIFF.... WAVEfmt
xls	D0 CF 11 E0 A1 B1 1A E1	ÐÏ.àj±.á
mp3	FF Fx	ÿ.
pdf	25 50 44 46	%PDF
zip	50 4B 03 04	PK..

Digital Data

0. Consider the byte: 01110001 (show work for partial credit!)

a) (5pts) What is the decimal representation of the binary number 01110001?

b) (5pts) What is the hex representation of the byte 01110001?

1. The file named fly.mp3 consists of the three bytes, which can be interpreted in several ways:

bits:	01000010	01001101	00100100
hex:	42	4d	24
decimal:	66	77	36

a) (5pts) What exactly is displayed if fly.mp3 is opened in notepad?

b) (5pts) What exactly is displayed if fly.mp3 is opened in Frhed?

c) (5pts) What kind of file is fly.mp3? Explain your answer!

Architecture

2. (5pts) Your dad is describing his new PC. Help him with his units.

a. My PC harddrive is 2 kilobytes / megabytes / gigabytes / terabytes (circle one)

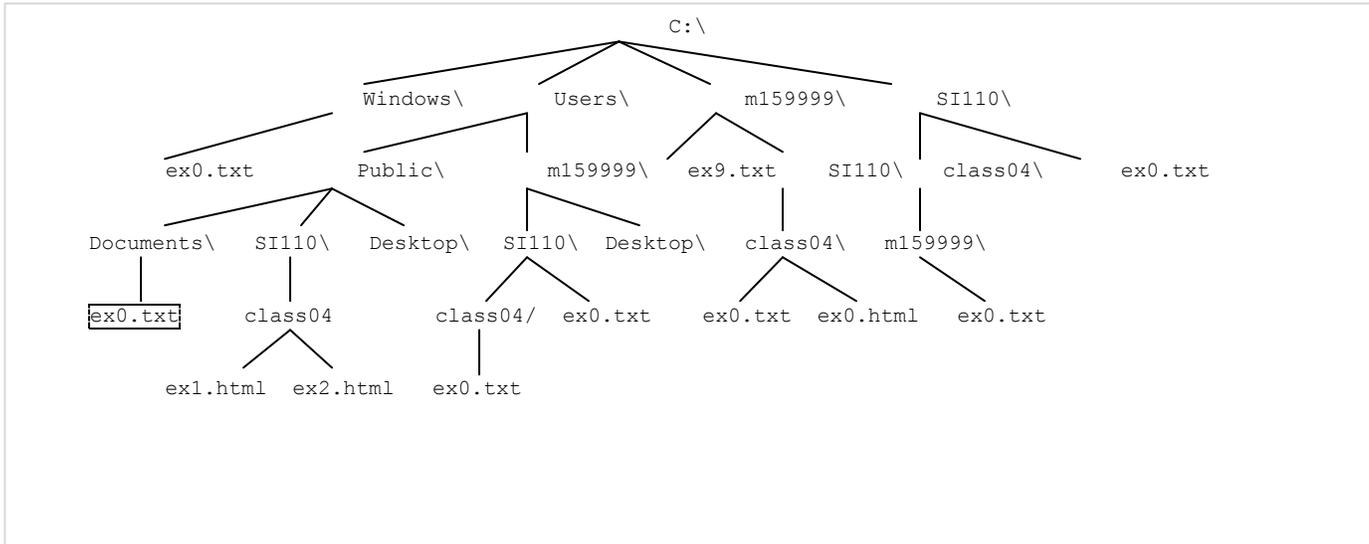
b. My PC memory is 4 kilobytes / megabytes / gigabytes / terabytes (circle one)

3. (5pts) When a computer is executing a program, where do the instructions the CPU executes come from? Give a thorough answer!

4. (5pts) When you took apart a PC in class, you found that the CPU sits underneath a fan and a big metal thing with lots of fins. Why? What is the purpose of the fan and the big metal thing?

Operating Systems 1, 2 & 3

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



5. (5pts) On the diagram above, draw a circle around the folder or file named by

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

6. (5pts) **Write** the full absolute pathname for the folder or file marked as ex0.txt

7. (5pts) Suppose your current directory is C:\Users\m159999, write command(s) to change the current directory to Public.

8. (5pts) Suppose your current directory is C:\m159999\SI110, write command(s) to copy file ex9.txt to directory class04 (i.e. to C:\m159999\SI110\class04).

9. (5pts) Suppose your current directory is C:\SI110\class04\m159999, On the diagram above, draw a rectangular box around the directory you'll be in after executing the command:

cd ..\..

10. (6pts) Suppose Dr. Brown (username wcbrown) is logged into rona.cs.usna.edu. Both Dr. Brown and MIDN Jones (username m159999) have a file named readme.txt in their home directories. Dr. Brown gives three commands (shown below).

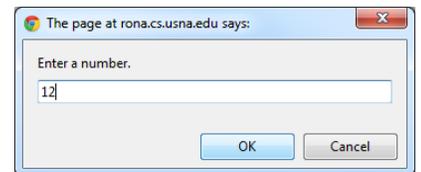
a. The command `cat /home/wcbrown/readme.txt` succeeds. Why?

b. The command `cat /home/m159999/readme.txt` fails. Why?

c. After logging in as the root user, the command `cat /home/m159999/readme.txt` succeeds. Why?

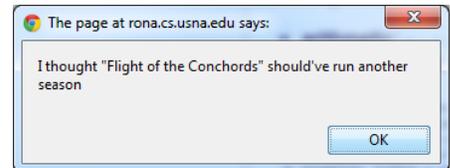
Programming I & II

11. (9pts) Consider executing the program below. Assuming the user enters 12 at the prompt (as shown in screen capture) and clicks OK, fill in the table. The arrow means "at this point in the execution". **Note:** If the value is a string, write it in quotes!



	value of x	value of y
<code>var x = 5;</code>		
<-----	_____	<u>undefined</u>
<code>var y = prompt("Enter a number.");</code>		
<-----	_____	_____
<code>y = Number(y)</code>		
<-----	_____	_____
<code>x = x + y;</code>		
<-----	_____	_____
<code>y = y + "0"</code>		
<-----	_____	_____

12. (5pts) Circle the letter for every one of the following that correctly displays the alert box shown to the right.



- a. `alert("I thought "Flight of the Conchords" should've run another season");`
- b. `alert('I thought "Flight of the Conchords" should've run another season');`
- c. `alert("I thought \"Flight of the Conchords\" should've run another season");`
- d. `alert('I thought \"Flight of the Conchords\" should've run another season');`
- e. `alert('I thought \"Flight of the Conchords\" should've run another season');`

Programming III & IV

Consider the following program, which the next three problems refer to:

```
var input = prompt("Enter!");
if (input.length > 1)
{
  alert("bad");
}
else
{
  if (Number(input) < 5)
  {
    alert("good");
  }
  else
  {
    alert("bad");
  }
}
}
```

13. (5pts) What is displayed in the alert box if the user enters:

a. 14 _____

b. 7 _____

c. 0 _____

d. -7 _____

e. hello _____

14. (5pts) Explain why the program outputs "good" if the user presses OK without entering anything.

15. (5pts) Circle the one(s) of the following that is(are) equivalent to the above program:

```
var input = prompt("Enter!");
if (input.length <= 1
    && Number(input) < 5)
{
  alert("good");
}
else
{
  alert("bad");
}
}
```

```
var input = prompt("Enter!");
if (input.length < 1
    && Number(input) < 5)
{
  alert("good");
}
else
{
  alert("bad");
}
}
```

```
var input = prompt("Enter!");
if (input.length > 1
    && Number(input) >= 5)
{
  alert("bad");
}
else
{
  alert("good");
}
}
```

```
var input = prompt("Enter!");
if (input.length > 1
    || Number(input) > 5)
{
  alert("good");
}
else
{
  alert("bad");
}
}
```

Programming IV

16. (5pts) The following program counts the number of a's in a string input by the user. Modify it so that instead of always counting a's, the user also enters the character to count.

```
var input = prompt("Enter string");

var count = 0;

var itr = 0;

while(itr < input.length)
{

  if ("a" == input[itr])
  {

    count = count + 1;

  }

  itr = itr + 1;

}

alert("There are " + count + " a's in your string");
```

17. (5pts) What is the value of the expression `"si110".charCodeAt(0)`?

18. (5pts) What is the value of the expression `String.fromCharCode(65)`?

Web Intro

19. (9pts) For the following URLs, underline the protocol part, draw a rectangular box around the server part, and circle the filesystem path part. Make sure your box has sharp corners and is clearly distinguishable from the circled part!

a. `https://www.navyfederal.org/products-services/loans/auto/auto-loans.php`

b. `http://www.mgcars.org.uk/MGC/mgcpics.html`

c. `file:///C:/Users/wcbrown/answers.txt`

20. (10pts) Suppose your computer is named `15smith-c96a.academy.usna.edu`. You enter the URL `http://intranet.usna.edu/Schedules/text/pod2.pdf` into your browser and hit enter. Complete the following narrative of what happens next by circling the proper word in each boxed section and filling in the proper **computer name** in each underlined area.

The web client / server on _____ connects to the web client / server on _____ and sends it an HTTP GET request for the file _____.

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

Then the web client / server receives the file and echoes / reads / renders it on the screen of _____.

21. (5pts) Midn Di Shonest claims to have pulled up and read the SI110 student notes webpage for lecture 10 on his laptop. However, his instructor suspects that is not true. Without access to the Mid's laptop, where can the instructor look for proof that Midn Di Shonest did or did not pull up the lecture 10 page?

22. (5pts) Consider the following page, which lives at:
<http://rona.cs.usna.edu/~m159999/index.html>

```
<html>
  <head></head>
  <body>
    This is me: . My family is important to me.
    To see them <a href="img/family.jpg">click here</a>.
  <p>
    My favorite athlete ever is Babe Ruth.
    
    If you want to learn about him, check out
    <a href="http://sabr.org/bioproj/person/9dcdd01c">this bio</a>.
  </p>
</body>
</html>
```

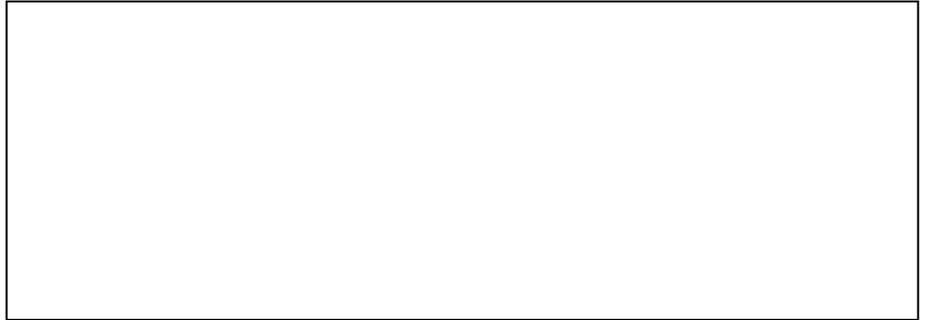
If you were to view the above page (and only this page!) in your browser, which of the following GET requests will the browser actually make in rendering the page? (Circle "make" or "not make" for each.)

GET /bioproj/person/9dcdd01c	to sabr.org	make / not make
GET /bp_ftp/images3/RuthBabe.jpg	to bioproj.sabr.org	make / not make
GET /~m159999/img/me.jpg	to rona.cs.usna.edu	make / not make
GET /~m159999/img/family.jpg	to rona.cs.usna.edu	make / not make
GET /~m159999/index.html	to rona.cs.usna.edu	make / not make

Build-a-webpage lab

23. (5pts) Draw how this HTML would be rendered by the browser:

```
<html>
  <head> </head>
  <body>
    My life <p>is</p> <u>now</u>
    complete, since <p>I've
    taken sill10!</p>
  </body>
</html>
```



24. (5pts) In order to make your index.html (and other files) available to anyone inside the Academy at the URL

<http://rona.cs.usna.edu/~m159999/index.html>

you needed to set the access permissions to *readable* by "other" users on rona. Why? After all your company officer doesn't even have an account on rona, so he can't login to access your index.html regardless of the permission settings. So, what other user is it that needs permission to access the file index.html?