Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Snyder: Wi14

Final Exam: CSE120

No materials except an 8.5 x 11 sheet of paper, handwritten, a writing device and eraser. **All other technologies must be stowed.** Answer all questions. Please check your work.

If you need a fact such as the RGB numbers for purple or ASCII for “C”, use question marks and give a comment as in: x=color(?,?,?); //RGB for color purple

In the multiple choice questions, circle the letter of the best answer.

1. [2] How do we know that an algorithm like sorting does what we say it does?
   1. Explain how the properties of its operation make it work.
   2. People know intuitively when programs are right.
   3. Trust the computer to check itself.
   4. Try some examples and see if it’s the right result.
2. [2] What happens if you “comment out” the basis case of a recursive program?
   1. It stops and does nothing.
   2. It executes until it runs out of memory.
   3. No change if the parentheses and braces are balanced.
   4. The program runs fine, but probably computes the wrong result.
3. [2] In the Ethernet protocol, what happens when two computers want to send at the same time?
   1. They make a request to the Line Controller for permission to send
   2. They both begin, but notice that what they sent is garbled
   3. The computer with the lower Ethernet ID number goes first
   4. It never happens because of the Round Robin turn-taking protocol
4. [2] Which statement is wrong:
   1. “ISP stands for Internet Service Provider.”
   2. “The Internet uses packets that are analogous to postcards.”
   3. “I looked up the information on the Internet.”
   4. “The Internet connects to UW through a gateway”
5. [3] Metadata is \_\_\_\_\_data about data\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. [8] Give examples:
   1. An assistive computer technology \_text to speech, text “magnifying glass”
   2. Another assistive computer technology \_alt in HTML, SMS or others\_
   3. An non-computer assistive technology \_crutches, ramps, tapered curbs\_
   4. A technology that began as assistive, but now we all use

\_telephone or any of the above \_\_\_\_\_\_\_

1. [3] Define privacy \_is the right of people to freely choose under what circumstances and to what extent they will reveal themselves, their attitudes and their behavior to others.

1. [4] If the guest photo hides in the host photo, how many bits are used to represent the RGB colors in steganography: guest \_\_2\_\_\_\_\_ host \_\_\_6\_\_\_\_
2. [2] Steganography is so named because
   1. The original (erroneous) report of Stegosaurus’s discovery was hidden in a photo
   2. A Greek slave had text tattooed on his head
   3. The picture of a little boy was encoded in a picture of a Stegosaurus
   4. None of the above
3. [2] Which statement is wrong:
   1. “Chrome and Firefox are both examples of Web server software.”
   2. “Google can find pages explaining that the Internet as a bunch of tubes.”
   3. “The client/server exchange means Web interactions are brief.”
   4. “Facebook and Amazon are part of the World Wide Web.”
4. [2] Opening email attachments is risky because
   1. They often contain bad news.
   2. A worm could be released, bringing malware to your computer.
   3. The attachment may be incompatible with your software causing a crash.
   4. Actually, it’s not risky because your ISP checks attachments first.
5. [2] Watson’s win on the Jeopardy TV show proves that computers
   1. Are intelligent
   2. Can get a joke
   3. Can process massive amounts of unstructured data
   4. Press a buzzer faster than people
6. [8] Give examples of:
   1. The name of a network protocol: \_\_http, TCP/IP, Ethernet, Client/server
   2. Domain name: \_washington.edu\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. A numeric value that can’t be part of an IP-Address: \_\_257\_\_\_\_\_\_\_\_\_\_\_
   4. A Top Level Domain Name: \_.edu, .ca, .mx, etc.\_\_\_\_\_\_
7. [4] If there are 3-grams that occur only once in, ACGAGCATACGAGCA give them or say there are none: CAT, ATA, TAC
8. [2] Email saying “Your bank account has been suspended because of security concerns. Please visit this URL to reopen it,” is an example of

\_\_\_\_\_\_phishng scam \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. [2] The binary sequence used to scramble clear text in an encryption algorithm is called \_\_key, or private key, or public key \_\_\_\_\_\_\_\_\_\_\_\_
2. [3] If array reference ev[4] is defined, then ev.length is at least \_\_\_5\_\_\_\_\_
3. [3] Complaining about your boss on Facebook is really dumb because

“The boss can see it, be offended and take action you may not like” or anything similar

1. [2] “Alan Turing invented the CAPTCHA” is an example of:
   1. Important computing history
   2. A true statement
   3. A false statement
   4. A fact that Watson would know
2. [2] These bits: 0101 0101 1010 1010 0101 0101 1010 1010 mean what?
   1. Hexadecimal for 55aa55aa
   2. Yucky looking (semi-transparent) green
   3. IP-address: 85.170.85.170
   4. All of the above and more.
3. [2] Paul Revere was shown to be a potential threat to England by using big data consisting of
   1. A graph in which all colonists are connected to all other colonists
   2. An analysis of Revere’s conversations with John Adams and other patriots
   3. Membership metadata about clubs and organizations in Boston
   4. All of the above.
4. [2] “Births are more numerous on Valentine’s day than on the days around it” is a fact that
   1. Can be discovered using an archive of birth certificate data
   2. Requires complex analysis such as “betweeness centrality”
   3. Would not be observed if Valentine’s day was in May like Mothers day
   4. All of the above.
5. [6] The array shade has sixteen color elements, and the code

for (int i = 0; i < 16; i++) {

shade[i] = color(15, 175-5\*i, 175-5\*i) ;

}

is run.

Give the color specification for shade[3] color(15,160, 160)

Give the color specification for the darkest color color(15, 100, 100)

1. [3] When Googling, you directly use one part of a search engine called \_\_\_\_\_\_\_\_

\_\_\_\_a query processor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. [8] Answer the following questions about the binary number 1101 0110
   1. This number is even; what change is necessary to make it odd?

\_\_\_flip the final rightmost bit to 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Is the “25 place” a 0 or a 1? \_\_\_0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. What would the binary representation be if this number were divided by 2? \_\_\_\_\_0110 1011\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. How many bytes are needed to represent this number? \_\_\_\_1\_\_\_\_\_\_\_\_\_

1. [6] If a DNS server is asking a computer for the number for .washington, it is asking for a(n) \_\_\_IP-address\_\_\_from a(n) \_\_ANS or authoritative name server\_\_
2. [2] Target Corp. uses big data analysis to figure out if a woman is pregnant using purchase history for products such as
   1. Unscented lotion
   2. Pregnancy test kits
   3. Large handbags
   4. All of the above
3. [2] Target’s data analysis that discovers if a woman is pregnant violates
   1. No privacy law whatsoever
   2. U.S. privacy law known as the “American’s Personal Data Act”
   3. Minnesota’s state law against unreasonable violation of privacy
   4. A supreme court decision called **Brandeis v. United States**
4. [2] Phishing is
   1. A social engineering technique to fool people into giving up sensitive data
   2. May use a sad story about the widow of the former Nigerian president
   3. A computer crime that frequently results in identity theft
   4. All of the above
5. [8] Declare and initialize to a legal value the four variables: a, b, c, d so that each one is of a different datatype:

int a = 1;

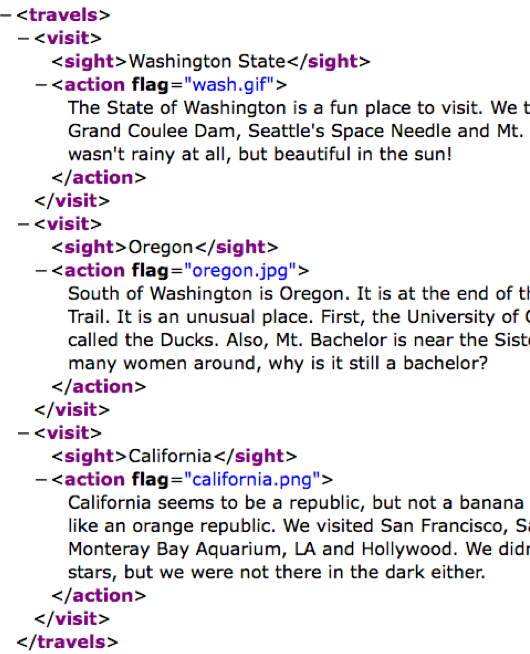
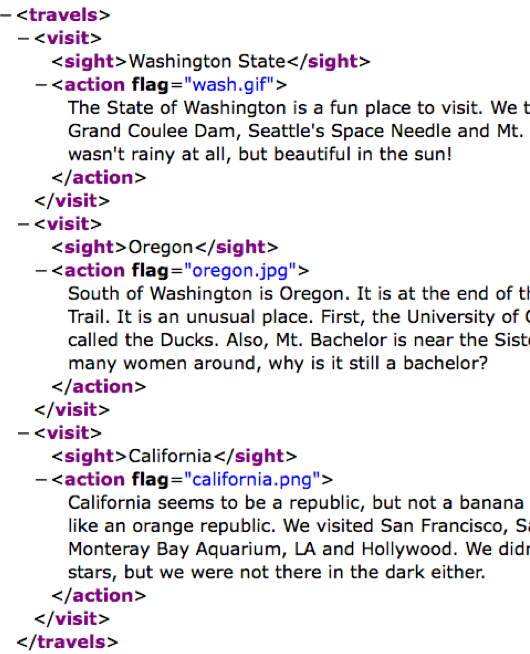
float b = 2.09;

char c = 'a';

Boolean d = true;

colors, strings, arrays of any of these, etc.

1. [3] Which of the following is not a legal XML tag?
   1. <garbage>
   2. <file input>
   3. <i\_\_\_\_talic>
   4. <xsl:template>
2. [4] Some people believe that creativity takes two forms; what are they?



a) incremental modification

b) flash out of the blue

1. [6] XML tags are used in 3 different ways. Using the code at right, fill in the table:

|  |  |
| --- | --- |
| The tag | is used in this way |
| travels | collective |
| visit | affinity |
| sight | identity |

1.  [10] Consider the following code, a variation of lab 9. It inputs a color picture of Nate Silver, and changes it under user control.
   1. To change the pixels to magenta (red and blue but no green), complete the programmer’s text for the line

color(red(c), 0, blue(c)) //correct use "ints" OK

* 1. To change the pixels to gray color by averaging the three colors of each one, complete the programmer’s text for the line

color((red(c)+green(c)+blue(c))/3)

* 1. The programmer wants the picture to change as the user moves the mouse down the picture, but there is a bug in the program; give only the **corrected** line(s) to make this happen:

if (mouseY > 0) {

for(int i=0; I < width; i++) {

for(int j=0; j < mouseY; j++) {

1. [4] “DNS servers cache the results of requests that they have received” Explain what that quote means.

DNS servers look up the IP-address of domain names; they keep a list of all of the (IP-address,domain names) they’ve found previously, and check there first.

1. [6] Show what HTML this XSL code produces

<xsl:template match="headline">

<h1><i>

<xsl:apply-templates/>

</i></h1>

</xsl:template>

in response to this XML <headline>Go Huskies</headline>

<h1><i>Go Huskies</i></h1>

1. [10] If the char array let[ ] contains letters, write a loop that will display them separated by dashes, as in s-e-p-a-r-a-t-e-d. [Assume letters are 12 pixels wide in an already-defined font, and dashes are 6px.]

for (int i =0; i < let.length; i++) {

text(let[i], 20+18\*i, 100);

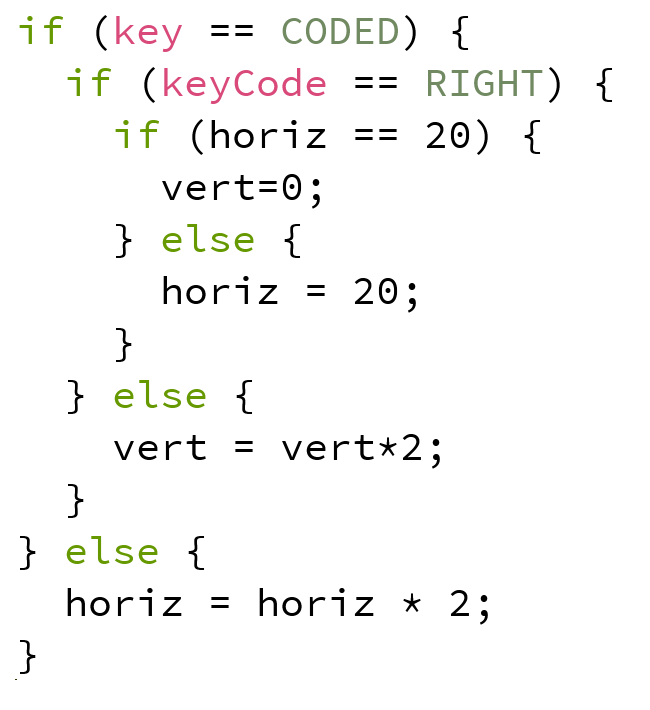
if (i != let.length-1) {

text('-', 32+18\*i, 100);

}

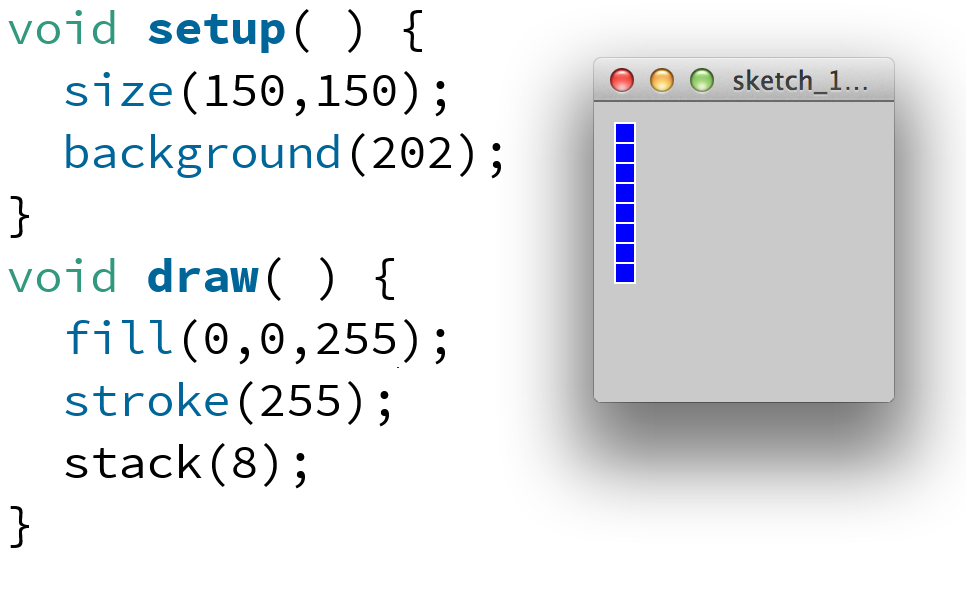
}

1. [6] If horiz and vert are both 20, what are they after this code runs when the key is

key: RIGHT UP A

horiz: \_\_20\_\_\_ \_\_\_20\_\_ \_ \_\_\_40\_\_

vert: \_\_\_0\_\_\_\_ \_\_\_40\_\_\_ \_\_\_20\_\_

1. [15] Write a Processing function stack( ) that *does not use a for loop* to create the canvas at right [a square is 10 x 10].

State any assumptions you need to make.

[Hint: you do not have to draw the boxes top

to bottom.]

void stack(int n) {

if(n != 0) {

rect(10, n\*10, 10, 10);

stack(n-1);

}

}

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Keep This Page Up Until Told To Start

Stow everything except your 8.5 x 11 sheet of notes, handwritten, writing tool and eraser.