Score \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Snyder: Wi14

Midterm Exam: CSE120

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

1. [8] Declare and initialize (to a legal value):

a) color variable, bleu color bleu = color(0,0,255);

b) Boolean variable, gameOver boolean gameOver = true;

c) a variable me initialized to your last name String me = "snyder";

d) a character variable dub char dub = 'w';

2. [3] Declare an array named bunch of ten integer values

int[ ] bunch = new int[7];

3. [2] The correct term for int, float, PFont and others is *datatypes*

4. [2] The correct term for F1 and F2 in Lightbot is *functions*

5. [2] The correct term for the 150 in line(150, 130, 4, 4) is *argument*

6. [4] Consider the text line(150, 150, mousex, mousey); Explain how it could be

Flagged As An Error *If mousex and/or mousey is not declared, it’s flagged as an error; if mouseX was intended, it needs the X needs to be capitalized.*

Accepted As Correct *It’s OK if mousex and mousey are declared*.

7. [2] What is the decimal value of this binary number: 1 0000 0100 *260*

8. [2] What is decimal value 67 in binary? *100 0011*

9. [3] Add the two binary numbers: 1 0110 0110

+ 1110 0100

10 0100 1010

10. [4] Write a for-loop with loop variable t that gets values 0, 1, 2, … , 11, 12.

for (int t = 0; t < 13; t++) { }

11. [5] Imagine a for-loop with loop variable t that ranges from 0 to 12, and inside the body of the loop is the function

rect( 10+t\*20, 100, 5, 5 );

Fill in the rectangle function so it draws 5x5 squares every 20 pixels across the screen starting at 10 pixels in from the left, and 100 pixels down from the top:

12. [2] If xpos has the value 100, what does min(xpos, 101) compute? *100*

13. [7] Computers are cheap and powerful because of three discoveries/inventions:

* The idea of \_\_\_\_*transistors or solid-state electronics*\_\_\_\_\_\_allows engineers to switch electricity without any “moving parts” to wear out
* The idea of \_\_\_\_*integrated circuits*\_\_\_\_\_\_\_\_ means that “active” and “connective” parts of a computer can be built together,” no assembly required
* The idea of \_\_\_\_\_\_*photolithography*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ allows circuits to be “printed” onto a chip, so it doesn’t matter how \_\_\_\_\_\_*complex*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the circuitry is.

14. [10] Define a function that has two integer parameters named u and v, and draws the ellipse(100, 100, u, v); in red with no boarder.

void oval (int u, int v) {

fill(255,0,0);

noStroke( );

ellipse(100,100, u, v);

}

15. [6] The following glasses illustrate the fundamental idea of information as the presence or absence of a phenomenon. Say what “present” and “absent” are so that if present is 1, the binary sequence is correct.



011001001 110110101 010010100

Present: \_\_\_\_\_*tall glass*\_\_\_\_ \_\_*no orange slice*\_ \_\_*empty*\_\_\_\_

Absent: \_\_*not tall glass*\_\_ \_*with orange slice*\_ \_\_*not empty*\_\_

16. [10] Puce is a color with RGB equal to 199, 21, 133 and orchid has RGB equal to 186, 85, 211. Define a function named choice with a single parameter op, which has value either 'o' or 'p', and returns either the color orchid or the color puce.

color choice (char op) {

if (op == 'o') { // is it orchid?

return color(186, 85, 211); // yes

} else {

return color(199, 21,133); // no

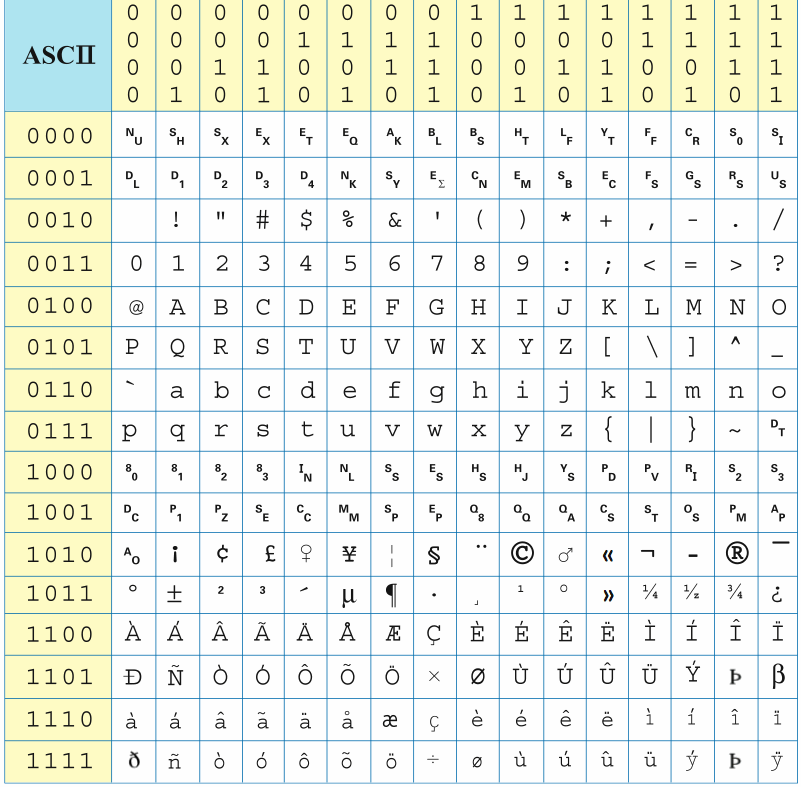
}

17. [3] Illustrate the use of the function in question 16 to set the fill color to puce.

fill(choice('p');

18. [4] The following run-length encoding compresses what data? 7:0, 2:1, 2:0, 5:1 2:0

000000011001111100

19. [3] Represent a “winky face” in ASCII? ;-) \_\_\_\_\_\_

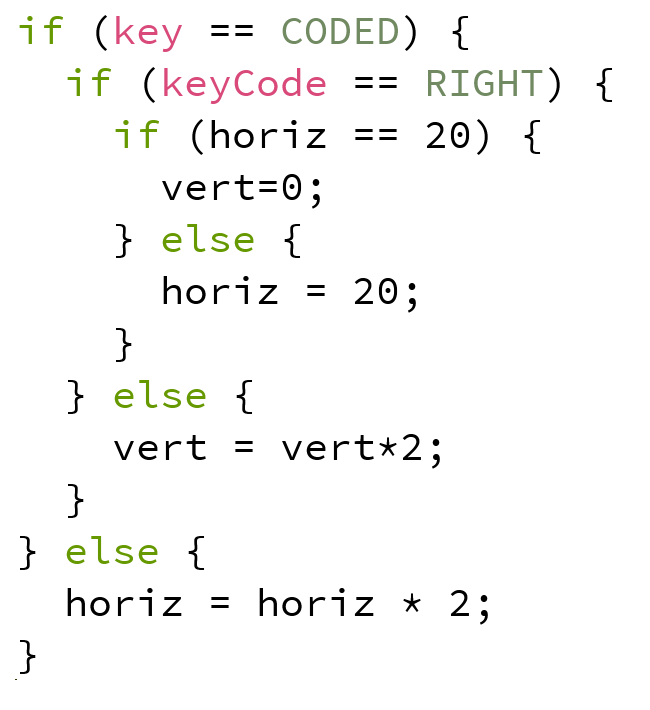
0011 1011 0010 1101 0010 1001

20. [4] We know that two in binary is 10. However, according to the ASCII table above, it is 0011 0010. Explain why it seems there are two different ways to represent two.

*Two can be either a number or a character (numeral). When it is a number we represent it in positional notation (10); when it’s a number all, we ASCII.*

21. [3] In explaining why the Exchange Sort works, we stated an important point:

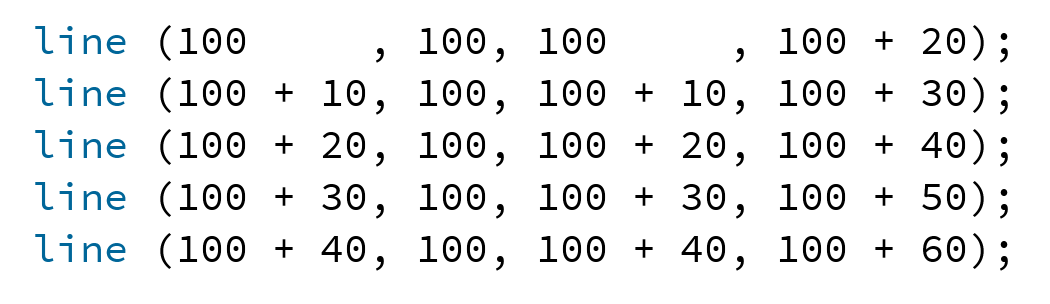
“After the first pass through the data \_\_*the smallest input item*\_\_\_ must be in the first position.”

22. [6] If horiz and vert are both 20, what are they after this code runs, if the key is:

key: RIGHT UP A

horiz: 20 20 40

vert: 0 40 20



23. [5] Abstract the following statements,

by saying what they do. [Hint: draw the computation.]

*The code draws vertical lines spaced horizontally ever 10 pixels, the first of which is length 20, and the others are progressively longer by 10 pixels.*

24. [4] If elli[ ] is an integer array containing five elements

a) Assign the middle element the value 100. elli[2] = 100;

b) Add the first and last element together and assign the result to the integer sum.

sum = elli[0] + elli[4];

25. [4] The question “What do these bits mean 0011 1010 0110 1101 1000?” is a silly question, because of an important principle. Give the principle:

*Bits have not inherent meaning; bits can represent any digital information.*

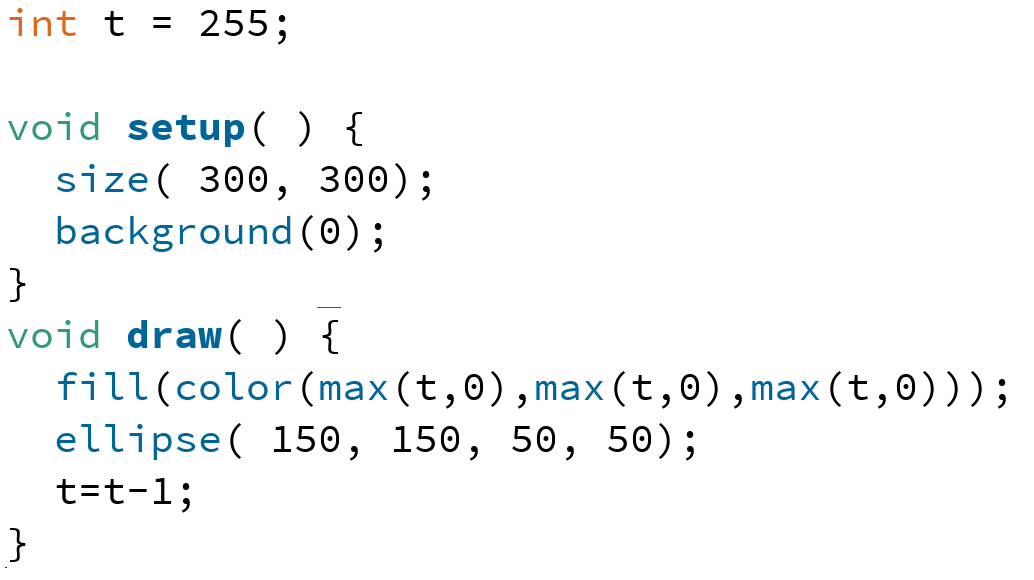
26. [5] Except for the declaration stating that flip is an integer initially set to 0, the only assignment statement to flip is in the draw( ) function and it is

flip = 2 – flip;

What are the first five values assigned to flip? 0 2 0 2 0

Abstract this computation

flip *is an integer whose value oscillates between 0 and 2 with each call to draw( ).*

27. [7] Say in your own words what the following Processing program will display –

*The program displays a black canvas with a circle 50 pixel diameter circle in the middle, which begins as white, and steadily changes to gray until it disappears into the background.*

28. [5] Say in words what the Fetch/Execute Cycle does – be specific about its steps.

*The fetch/execute cycle interprets computer instructions by first fetching them from memory, decoding them, fetching their data from memory, and then executing them. Finally, it returns the result to the memory.*

Midterm Exam

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CSE120 Wi 14

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