CSC 254
NOTES
Week 03

Name (Print): _____

This assignment contains 6 pages (including this page) and 42 questions. Check to see if any pages are missing.

These pages are indexed to the videos for this course.

Grading
Your answers must be hand-written on printed copies of the notes.

- This document will only be "spot checked." Not all answers may be graded.
- *Don't skip questions!* If you don't know an answer, at least give it a try. Or explain what you don't understand. Put a big star or arrow around the points you don't understand and ask about them in class.
- Keep your copy. When I make up the test I will go down the notes page and draw inspiration from these questions when making up the exam. These notes pages will be good study guides.
- You may write any lingering questions or muddy points at the end of the document. Then ask in class
- Scan this document into a .pdf file and turn it in. If you don't have access to a regular scanner then install a "CamScanner" app on your phone or tablet. They work pretty well. Photographs will not be accepted. You must scan to a .pdf document.

Video 03.003 Newlines

1. What is the difference between the `System.out.print()` and System.out.println() methods?
2. Is \n considered one character or two?
3. What does \n mean?

Video 03.005 Printf

4. Is printf limited to Java, C, and C++?
5. What is the format specifier for each of the following?
   - integer types
   - floating point (real numbers)
   - Strings

6. Rewrite the following println statement as a printf. Don't forget the \n at the end! Assume that both of the variables are *int*.

```
System.out.println("Pat bought "+apples+"  and "+oranges+" oranges.");
```

Video 03.010 Named Constants

7. write the declaration for a constant for sales tax. The sales tax is 0.0675. Be sure to use correct CAPITALIZATION.

Video 03.020 Assignments

8. In Java, `x = x + 1` is not a mathematical equation. Explain why this is not an equation. What does it mean in Java? If it helps, assume you are trying to explain to a non-programmer what the statement means.

9. Rewrite the following two statements using the "shortcut" notation.

```
i = i + 39;
s = s + "world";
```

Video 03.020 Assignments Part 2

10. In the debugger, what is the name for the "red dot?"

11. In the debugger, how do you execute one statement at a time?

12. How do you stop the debugger?

13. Rewrite each of the following statements using the appropriate shortcut.

    - `x = x - 2;`
    - `x = x * 2;`
    - `x = x / 2;`
    - `x = x % 2;`

Video 03.025 Increment Operator

14. Write the following statement using the increment operator.

```
cents = cents + 1;
```

15. What is the output of the following lines of code? If you need to, write a quick little program that tests it out.

```
int i = 6;
int j = i++;
System.out.printf("i is %d and j is %d.\",i,j);
int j = ++i;
System.out.printf("i is %d and j is %d.\",i,j);
j = i++ * 3;
System.out.printf("i is %d and j is %d.\",i,j);
j = ++i * 3;
System.out.printf("i is %d and j is %d.\",i,j);
```

Output:

i is ____ and j is ____

i is ____ and j is ____

i is ____ and j is ____

i is ____ and j is ____

16. The previous question was kind of a nightmare to figure out. It is prone to errors. How can you avoid these types of errors with the increment and decrement operators?

17. What is the postfix decrement operator?

    Video 03.027 Bits and Bytes

    Don't worry, I am not dead. My camera just froze part way through the video.

18. What do light switches have to do with computers?

19. What are the 4 patterns available in 4 bits?

20. *Approximately* how many patterns can you have with 32 bits?

21. Suppose 1011 is a 4-bit binary number. What is this number in decimal?

22. How many different patterns can you have with 8 bits?

23. Does Java have unsigned integers?

24. What is a byte on modern computers?

    Video 03.030

    I am still not dead. Despite appearances.

25. What is the default integer type in Java?

26. What is the default real number type in Java?

27. When using a double, how many significant digits are available?

28. When using a float, how many significant digits are available?

29. Approximately what is the largest exponent possible for doubles (to the nearest 100)?

30. Approximately what is the largest exponent possible for floats (to the nearest 10)?

31. Write the line of code needed to assign the value of 3.14 to a float variable called smallPi

32. Suppose f is a float and x is a double.

    Is this statement legal in Java? `x = f;`

    Is this statement legal in Java `f = x;`

    Explain your answers.

Video 03.040 Numeric Types (integers)

33. What is the range for the data type `byte`?

34. What is the range for the data type `short`?

35. *Approximately* what is the range for the data type `int`;

36. *Very roughly,* what is the range for the data type `long`;

37. Suppose grades are represented as integers from 0 through 100. Would it be safe to use a byte to represent a grade of this type? Explain.

38. Is it OK to use leading zeros when writing decimal integers in Java? What does the leading zero indicate?

Video 03.080 Feet2Meters

39. Why was FEET2METERS capitalized?

40. The program did the output with println and printf. In your opinion, which was better? Why? (There is no correct answer. The question is asking for your opinion and why you picked that answer.) ***Video 03.090***

Integer Division Danger

41. The title suggests there is danger. What is the danger?

42. What is a cast? Consider the following two statements. Assume that i is an integer and x is a double.

```
x = i;
i = x;
```

Would either of the statements be "safe?" Would either be dangerous? If one or both of the statements is dangerous, rewrite it so that it does a proper cast.

If you have any questions, please write them in the area below.