Lesson 01

CSC140 Foundations of Computer Science

12 February 2020

1. Complete this definition: "A variable is a. . . "
2. Which of the following statements would make sense in a mathematics class? in a computer science class?

   Explain your answer in each case.

$$x = x + 1 \tag{1}$$
$$y = x - 9 \tag{2}$$
$$x - 9 = y \tag{3}$$
$$64 = 32 + 32 \tag{4}$$
$$64 == 40 + 24 \tag{5}$$

3. What is the value of these Python expressions?

   `18 / 4`

   `18 // 4`

   `18 % 4`

4. When the Python interpreter evaluates `9 - 5 - 2`, will it yield $9-(5-2) = 6$ or $(9-5)-2 = 2$?
5. When the Python interpreter evalutes `2 ** 2 ** 3`, will it yield 64 or 256?

   That is, is

$$2^{2^3} = 4^3 = 64?$$

—or—

$$2^{2^3} = 2^8 = 256?$$

6. Look in the Purdue Online Writing Lab's article on Associated Press style to learn how the AP asks its journalists to abbreviate the name of our state.

   What is the purpose of the style guide? How might the AP's example be relevant to a study of software engineering?

7. Write code that...

   - creates a variable to hold the number of pounds of cherries, and assigns a value to that variable
   - creates a variable to hold the number of ounces of cherries, and assigns a value to that variable
   - creates a variable to hold the number of pounds of grapes, and assigns a value to that variable
   - creates a variable to hold the number of ounces of grapes, and assigns a value to that variable
   - creates a variable to hold the number of pounds of fruit, and assigns to it the number of pounds in the sum of the weight of the cherries and the weight of the grapes
   - creates a variable to hold the number of ounces of fruit, and assigns to it the number of pounds in the sum of the weight of the cherries and the weight of the grapes

8. Write code that computes the arithmetic mean of two numbers. Find the definition of "arithmetic mean" on the Web.

9. Write code that computes the geometric mean of two numbers. Find the definition of "geometric mean" on the Web.

10. Write code that computes the harmonic mean of two numbers. Find the definition of "harmonic mean" on the Web.

11. Write code the computes the weighted average of two numbers. Use a weight whose value that lies between 0.0 and 1.0.

12. Write code that computes the Euclidean distance between two points in the plane.

13. Write code that computes the Manhattan distance between two points in the plane.

14. A Caesar cipher replaces each letter in the plain text of a message with another letter. Learn how this cipher works. Write code that produces that letter with which to replace a given letter.

    You will need to use two functions: **ord**(c) returns the numerical code that is associated with a character c and **chr**(n) returns the character associated with a numerical code.