

# COP 3337 Assignment 3

## Problem 1

- a) False. There can be scenarios where all class elements are public, even the variables. You can call these data fields using the dot operator and the data field name.
- b) False. Just like regular functions, these variables would be local to that method and, therefore, can only be used by that method.
- c) False. Empty parentheses in the function prototype mean the function takes no inputs.
- d) True.

## Problem 2

- a) A header file gives a template for what a class should look like. It includes all a class's public and private elements, including data fields, constructors, and methods. The implementations of a class's constructors and methods are typically not included in the header file, as this makes the code less secure. The source code file is where these constructors and methods are implemented. All of the constructors and methods defined in the header file are to be implemented here. If they aren't implemented, a cannot find reference error will occur. Essentially, the header file is the template for the source code file.
- b) There are a couple of reasons why a class may provide get and set methods for its data fields. The first one has to do with access levels. If the data fields are declared private, they can't be accessed outside of the class. The get method would allow us to read the value stored, and the set would allow us to change it, even though the member is private. Another big reason for using get and set methods is ranges. Say we have an integer data field that realistically should always be positive. If we were to set the value of this data field directly using the dot operator, we could set it to whatever we want, including a negative number, which can't happen. The set method would have a condition where that data field can never be negative, so that if we were to pass a negative number in, the operation wouldn't happen.

## Problem 3

- a) The string pointer is not pointing to any specific memory point, so the value of the pointer cannot be printed. A string variable needs to be declared and its address pointed to in order for this code to work.
- b) These pointers are for different data types, so they cannot be reassigned to each other. If they were both for float or both for long data types, then this would be possible.
- c) What will be printed in this case is the address that the pointer is pointing to. By putting a star (\*) in front of the pointer name in the print statement, the value of x will be printed.

## Problem 4

PASSED  
FAILED

## Problem 5

Previous Closing Price: 27.5

Current Price: 27.6

Percent Change: 0.00363636

## Problem 6

```
{x: 0, y: 0, direction: 'up'}  
{x: 2, y: -1, direction: 'down'}  
{x: 7, y: -5, direction: 'right'}  
{x: 0, y: 0, direction: 'up'}  
{x: -3, y: 0, direction: 'left'}
```