CMPS 251 Tutorial 1 – Fall 2019

Chapter 3 exercises

3.12 *(`Invoice` Class)* Create a class called `Invoice` that a hardware store might use to represent an invoice for an item sold at the store. An `Invoice` should include four pieces of information as instance variables—a part number (type `String`), a part description (type `String`), a quantity of the item being purchased (type `int`) and a price per item (`double`). Your class should have a constructor that initializes the four instance variables. Provide a *set* and a *get* method for each instance variable. In addition, provide a method named `getInvoiceAmount` that calculates the invoice amount (i.e., multiplies the quantity by the price per item), then returns the amount as a `double` value. If the quantity is not positive, it should be set to `0`. If the price per item is not positive, it should be set to `0.0`. Write a test app named `InvoiceTest` that demonstrates class `Invoice`'s capabilities.

3.13 *(`Employee` Class)* Create a class called `Employee` that includes three instance variables—a first name (type `String`), a last name (type `String`) and a monthly salary (`double`). Provide a constructor that initializes the three instance variables. Provide a *set* and a *get* method for each instance variable. If the monthly salary is not positive, do not set its value. Write a test app named `EmployeeTest` that demonstrates class `Employee`'s capabilities. Create two `Employee` objects and display each object's *yearly* salary. Then give each `Employee` a 10% raise and display each `Employee`'s yearly salary again.

3.14 *(`Date` Class)* Create a class called `Date` that includes three instance variables—a month (type `int`), a day (type `int`) and a year (type `int`). Provide a constructor that initializes the three instance variables and assumes that the values provided are correct. Provide a *set* and a *get* method for each instance variable. Provide a method `displayDate` that displays the day , month and year separated by forward slashes (`/`). Write a test app named `DateTest` that demonstrates class `Date`'s capabilities.

Modify class `Date` constructor to perform data validation on the initializer values for variables `day` (must be between 1 and 31), `month` (must be between 1 and 12) and `year` (must be >= 2000).

Chapter 8 exercises

8.4 *(Rectangle Class)* Create a class `Rectangle` with attributes `length` and `width`, each of which defaults to 1. Provide methods that calculate the rectangle's perimeter and area. It has *set* and *get* methods for both `length` and `width`. The *set* methods should verify that `length` and `width` are each floating-point numbers larger than 0.0 and less than 20.0. Write a program to test class `Rectangle`.