CPSC 1061 – Introduction to Programming in Java Lab

Spring 2021

Lab 10 – Due Monday, April 5, 10:00pm

1 Introduction and Lab Objectives

In this lab you will practice using classes and objects in Java programs. The objectives of this lab are to:

1. create and work with classes and objects
2. distinguish between instance variables/methods and static variables/methods
3. program following data field encapsulation

2 Main

2.1 General Instructions

At the start of each program, write your name, the course and lab, the date, and a description of what your program does similar to the previous lab. Each program needs to have comments (not just at the beginning), to be clean, and to compile. Furthermore, any input and output should be designed to have appropriate instructions and sentences.

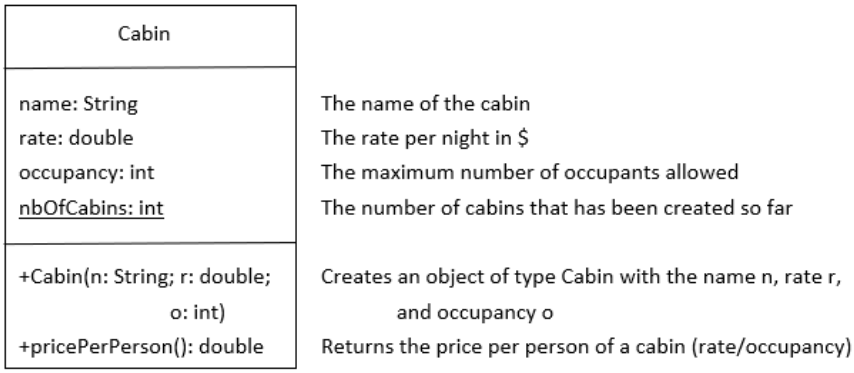
We are writing programs with multiple classes. You can submit different Java classes as different files or within the same file as long as the main program is named correctly (and of course compiles correctly).

2.2 Cabin.java and TestCabin.java

You are looking for a cabin to rent and want to find the one with the lowest price per person.

Write a class called Cabin based on the UML diagram below. Pay attention to which variables are instance variables and which variables are static variables. Create a second class called TestCabin that includes the main method. In the main method, create three cabins with reasonable values for the attributes. Print a statement when you create a cabin keeping track of the total number of cabins, e.g., as follows: "The Blue Ridge Cabin costs $400 per night and can lodge up to 10 persons. There are now 2 cabins in you database."

Compute the price per person for each cabin and choose the cabin with the lowest price per person.



2.3 Summer.java and TestSummer.java

You are still looking for a cabin to rent and want to find the one with the lowest price per person. Only now, follow one of the core concepts of Object Oriented Programming: Data Field Encapsulation (or just encapsulation). What does that mean? Start with copying the contents of Cabin.java to Summer.java. Declare all data fields as private. Create a getter method and a setter method for each data field (even if the method is not being used). Declare the methods as public.

Finally, create a class TestSummer with the same functionality than TestCabin, only now use the methods in the Summer class.

2.4 UseRandom.java

Ask the user for a positive number (type double). Using the Random class – not Math.random() – print 20 random numbers of type double between 0.0 (included) and the number given by the user (excluded).

2.5 Submit Files

Make sure to test your java files on the lab machines. Create a single zip-file that includes all the java files (and no other files) and submit the zip-file to Canvas.