

Week 11 Homework

Two exercises, Chapter 8, Practice Program 2 and Programming Project 7, plus one extra credit exercise, Chapter 8 Programming Project 3, worth 6 and 8 points, respectively, and 10 extra credit points.

1. Do Chapter 8 Practice Program 2, create and test a **Doctor** class:

- Define a class named **Doctor** whose objects are records for a clinic's doctors. Derive this class from the class Person given in Listing 8.1 and contained in the Week 11 Chapter 8 **Source Code** folder.
- A Doctor record has the doctor's *name*—defined in the class Person—a *specialty* as a *String* (for example Pediatrician, Obstetrician, General Practitioner, and so on), and an office-visit *fee* (use the type *double*).
- Give your class a reasonable complement of constructors (eg, a no-parameter default constructor and a 3-argument constructor) and accessor methods (*setters* and *getters* for *specialty* and *fee*).
- Also define an *equals* method that uses all the instance variables.
- Write a driver program to test all your methods.

2. Do Chapter 8 Programming Project **7**, modify the ***Student*** to implement Comparable:

- Modify the Student class in the Week 11 Chapter 8 **Source Code** folder so that it implements the Comparable interface.
- Define the *compareTo* method to order Student objects based on the value in *studentNumber*.
- In a *main* method create an array of at least five Student objects, sort them using *Arrays.sort*, and print out the students in the array. They should be listed by ascending student number.
- Next, modify the *compareTo* method so it orders Student objects based on the lexicographic ordering of the *name* variable. Without modification to the *main* method, the program should now output the students ordered by name.

Note that you will either have to Submit two different copies of the updated Student.java file with the two different implementations of *compareTo*, or else you can comment out one of the two *compareTo* implementations and Submit one copy of Student.java for grading.

3. For extra credit, do Chapter 8 Programming Project 3, create and test a ***Patient*** and a ***Billing*** class:

- Define two classes, **Patient** and **Billing**, whose objects are records for a clinic. Derive **Patient** from the class **Person** in the Week 11 Chapter 8 **Source Code** folder.
- A Patient record / object has the patient's *name* (defined in the class Person) and identification *number* (use the type *String*).
- A Billing object will contain a Patient object and a Doctor object (from Practice Program 2 above).
- Give your classes a reasonable complement of constructors and accessor methods, and an equals method as well.
- First write a driver program to test all your methods, then write a test program that:
 - creates at least two patients,
 - creates at least two doctors, and
 - creates at least two Billing records, and then
 - displays the total income from the Billing records (the sum of the Doctor fees from all of the Billing records).