Programming Project #1

CIS 2151 – Prof. John P. Baugh
Oakland Community College - OR

Points: _____ / 100

Objectives

- To solve problems related to classes
- To learn about how we can write software to help with healthcare

Introduction

This program will allow users to calculate values related to health, and present those values.

Instructions and Information

IMPORTANT NOTE: You should put all of your classes in a package named proj1.

NOT pr1, PrOj1, prJo012idgfuasdf, project1, myproj1, jpbprofisawesome1, program1, or snaggletooth1.

You must make it: proj1

While exercising, you can use a heart rate monitor to ensure that your heart rate stays within a safe range suggested by trainers and doctors. According to the AHA (American Heart Association), the formula for calculating your **maximum** heart rate in **beats per minute** is as follows:

maxBPM = 220 – age (in years)

Your **target** heart rate is in a range that's 50%-85% of your maximum heart rate (estimates from the AHA, but may vary by health, fitness level, and gender of the individual.)

For this project, you will create a class named **PersonHeartRate**.

The data (fields) your class must have include the following:

- The person's first name (a string)
- The person's last name (a string)
- The person's date of birth
    - Which itself, should consist of separate attributes for the month, day, and year
    - You should use ***another*** class named DateOfBirth with its own appropriate getters and setters

The data in your class must all be **private**, and only be modified as appropriate through class methods, which you will also write.

The behaviors/operations on your class are the following:

- A single constructor that has three parameters, each corresponding to each of the class's fields
- You should have **getters** and **setters** for each of the class's fields
- You should provide a method that calculates the user's age (in years)
    - This is based on his/her date of birth
- You should provide a method that calculates and returns the person's maximum heart rate
- You should provide a method that calculate and returns the person's target heart rate **range** (based on the 50-85% recommendation from the AHA) – you may return this value as just a string, e.g., "120 – 150")
    - You may use an integer and just truncate any decimal data
- A method called printData that prints out all the data about the person in the following format:

```
Baugh, John
Max heart rate:   181
Target heart rate:  90 - 153
```

You must also write a driver (client) class, **HeartRateDemo**, which contains the main method. The main method should contain a declaration and instantiation of an ArrayList of PersonHeartRate object references, named **heartRateList**.

From the main method, you should prompt the user for the first name, last name, and date of birth of the individual. Then, you must create an object (instance) of the PersonHeartRate class for that input data. After that, you put the object reference into the ArrayList (heartRateList). The age should be able to be calculated from the current date and the date of birth.

Then you should ask the user if they want to add a new person's information or exit and get all the users' data. You will continue to allow them (and prompt them) to enter first name, last name, and age, followed by object creation and reference storage into the heartRateList as long as the user indicates they want to continue.

When the user eventually chooses to exit, you should loop through the heartRateList and print out all the data for each individual in the aforementioned format.

Deliverables

To turn in the assignment, please upload the following:

- A zip file of ***a folder*** containing just the **.java files** necessary for the program to run.
    - Upload them to the appropriate assignment directory in Assignments on D2L.
- The zip file should also contain **screenshots** of your program working
    - Place the screenshots in a PDF
    - Place the PDF at the top level of your project folder