Assignment 1 – Spring 2019

Install your preferred Java IDE, and implement problem 3.16 from you textbook.

Problem 3.16 (Target-Heart-Rate Calculator) While exercising, you can use a heart-rate monitor to see that your heart rate stays within a safe range suggested by your trainers and doctors. According to the American Heart Association (AHA) (http://bit.ly/TargetHeartRates), the formula for calculating your maximum heart rate in beats per minute is 220 minus your age in years. Your target heart rate is a range that's 50 – 85% of your maximum heart rate. [Note: These formulas are estimates provided by the AHA. Maximum and target heart rates may vary based on the health, fitness and gender of the individual. Always consult a physician or qualified health-care professional before beginning or modifying an exercise program.] Create a class called $HeartRates$. The class attributes should include the person's first name, last name and date of birth (consisting of separate attributes for the month, day and year of birth). Your class should have a constructor that receives this data as parameters. For each attribute provide set and get methods. The class also should include a method that calculates and returns the person's age (in years), a method that calculates and returns the person's maximum heart rate and a method that calculates and returns the person's target heart rate. Write a Java app that prompts for the person's information, instantiates an object of class $HeartRates$ and prints the information from that object – including the person's first name, last name and date of birth—then calculates and prints the person's age in (years), maximum heart rate and target-heart-rate range.

Requirements:

1. Your program should compile and run in order to be graded
2. Submit two separate classes.
   a. $HeartRates$ as described above.
   b. $TestHeartRates$. This class contains the main method to prompt for input and generate output.
3. Your $HeartRates$ class should contain the following:
   a. Three variables for first name, last name, and year of birth
   b. Accessor (set) and mutator (get) methods for all three variables.
   c. Any additional methods you deem appropriate.
4. You must use $String\ formatters\ (i.e. printf(\dots))$ in printing the output
5. You are only required to capture the year of birth. In order to compute the age, you will need to programmatically obtain the current year. Use the following Java statement to retrieve the current year:

$$new\ GregorianCalendar().get(GregorianCalendar.YEAR)$$

Grading:

Item	Points
$HeartRates$ class (Compiles and runs)	1
$TestHeartRates$ class (Compiles and runs)	1
Accessor and mutator methods	2
Capturing health info from the command prompt	2
Printing health info to command prompt:	
• First name, last name, year of birth	1
• Age	1
• Maximum heart rate	1
• Target heart rate range	1
	10

Sample Input:

```
Person's First Name: Bob
Person's Last Name: Blue
Person's Year of birth: 1970
```

Sample Output:

```
First Name: Bob
Last Name: Blue
Age: 49
Maximum Heart Rate: 171
Target heart rate range: 86 - 145
```