Optional Exercises SDJ1

Exercise: TestScores Class

Design a `TestScores` class that has instance variables to hold three test scores, all of type `int`.

The class should have

- A 3-argument constructor taking 3 `int` values as argument and initialising all instance variables
- A zero-argument constructor initialising each of the instance variables to -1
- Accessor and mutator methods for the three test score instance variables (6 methods)
- A set method taking values for all 3 instance variables. Let your 3-args constructor call this method
- A method that returns the average of the test scores.
- A `toString` method returning a string with all three test scores and the average

Demonstrate the class by writing a separate program that creates an instance of the class (with a `main` method). The program should ask the user to enter three test scores, which are stored in the `TestScores` object. Then the program should display the average of the scores, as reported by the `TestScores` object.

Exercise: Temperature Class

Write a Temperature class that will hold a temperature in Fahrenheit and provide methods to get the temperature in Fahrenheit, Celsius, and Kelvin. The class should have the following instance variable:

- `fahrenheit` - A `double` that holds a Fahrenheit temperature.

The class should have the following methods:

- Constructor - The constructor accepts a Fahrenheit temperature (as a `double`) and stores it in the `fahrenheit` instance variable.
- `setFahrenheit` - The `setFahrenheit` method accepts a Fahrenheit temperature (as a `double`) and stores it in the `fahrenheit` instance variable.
- `getFahrenheit` - Returns the value of the `fahrenheit` instance variable, as a Fahrenheit temperature (no conversion required).
- `getCelsius` - Returns the value of the `fahrenheit` instance variable converted to Celsius.
- `getKelvin` - Returns the value of the `fahrenheit` instance variable converted to Kelvin.

Use the following formula to convert the Fahrenheit temperature to Celsius:

$$Celsius = (5/9) \times (Fahrenheit - 32)$$

Use the following formula to convert the Fahrenheit temperature to Kelvin:

$$Kelvin = ((5/9) \times (Fahrenheit - 32)) + 273$$

Demonstrate the Temperature class by writing a separate program that asks the user for a Fahrenheit temperature. The program should create an instance of the Temperature class, with the value entered by the user passed to the constructor. The program should then call the object's methods to display the temperature in Fahrenheit, Celsius and Kelvin.

Exercise: Employee Class

Write a class named `Employee` that has the following fields:

- `name`. The name field is a `String` object that holds the employee's name.
- `idNumber`. The `idNumber` is an `int` variable that holds the employee's ID number.
- `department`. The department field is a `String` object that holds the name of the department where the employee works.
- `position`. The position field is a `String` object that holds the employee's job title.

Write appropriate mutator methods that store values in these fields and accessor methods that return the values in these fields.

Once you have the written the class, write a separate program that creates three `Employee` objects to hold the following data.

Name	ID Number	Department	Position
Susan Meyers	47899	Accounting	Vice President
Mark Jones	39119	IT	Programmer
Joy Rogers	81774	Manufacturing	Engineer