Lab 19

Instructions: Complete the steps below. Be sure to upload a copy of all your source code (.java) files to the link on Brightspace by its deadline, so that you can receive credit for this lab.

1. Design a class named LinearEquation for a 2×2 system of linear equations:

   $$ax + by = e$$
   $$cx + dy = f$$

   Where: $x = \frac{ed-bf}{ad-bc}$ and $y = \frac{af-ec}{ad-bc}$

   The class contains:
   - Private data fields $a, b, c, d, e,$ and f.
   - A constructor with the arguments for $a, b, c, d, e,$ and f.
   - Six getter methods for $a, b, c, d, e,$ and f.
   - A method $isSolvable()$ that returns true if $ad - bc$ is not 0.
   - Method $getX()$ and $getY()$ that returns the solution for the equation.

   Write a test program that prompts the user to enter a, b, c, d, e, and f and display the result. If $ad - bc$ is 0, report that "The equation has no solution."

   Here is a sample run:

   Enter a, b, c, d, e, f: 9.0 4.0 3.0 -5.0 -6.0 -21.0
   X is -2.0 and y is 3.0
   Enter a, b, c, d, e, f: 1.0 2.0 2.0 4.0 4.0 5.0
   The equation has no solutions.

2. Design a class named `MyInteger`. The class contains :
   a. An `int` data field named value that stores the `int` value represented by this object.
   b. A constructor that creates a `MyInteger` object for the specified `int` value.
   c. A getter method that returns the int value.
   d. The methods `isEven(), isOdd(),` and `isPrime()` that return true if the value in this object is even, odd, or prime, respectively.
   e. The static methods `isEven(MyInteger), isOdd(MyInteger),` and `isPrime(MyInteger)` that return true if the specified value is even, odd, or prime, respectively.
   f. The methods `equals(int)` and `equals(MyInteger)` that returns true if the value in this object is equal to the specified value.

   Write a client program that tests all the methods in the class.

Grading Guidelines: This lab is graded on a scale of **0-3 points**, assigned as follows:

- **0 -** The student did not attend the lab,
- **3 -** The solutions are complete OR the student spent the entire lab solving the required lab problems (in this case, the students may not arrive at the lab after the lab started and may not leave until the lab ends).