

Chapter 9 Programming Project (80 points)

Read Chapter 9 in your book if you have not done so yet.

Design a class named **Linear_Equation** for a 2 X 2 system of linear equations:

$$\begin{array}{l} ax + by = e \\ cx + dy = f \end{array} \quad x = \frac{ed - bf}{ad - bc} \quad y = \frac{af - ec}{ad - bc}$$

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 named **NotSolvable()** that returns true if $ad - bc$ is 0.
- Methods **getX()** and **getY()** that return the solution for the equation.
- A method named **GetDeterminant()** that returns $ad - bc$

Write a test program that prompts the user to enter **a**, **b**, **c**, **d**, **e**, and **f** and displays the result as well as the determinant. If $ad - bc$ is 0, report that “The equation has no solution.”

You should be using methods as needed and not using global variables.

Name your file Chap9_PP_yourlastname. Submit your **Java** file (only) to D2L.

You will be graded on the following criteria:

- Complete comment block at beginning
- Comments throughout code
- Code compiles and runs (failure to compile and compile will be a automatic 50% deduction)
- Code works and produces desired output
- Variables are named by the standards previously provided (chapter 2)
- A class created meeting the guidelines provided
- Only concepts from chapters 1 through 9 of your book are used (use of concepts outside these chapters may result in up to a 50% deduction).

Programming / Coding Standards:

- As you write your code, use indenting (as appropriate), add white space to make code readable and add comments. Your comments will include preamble (or comment block) and throughout your code to explain what is happening.
- At the very beginning of every program file, you'll need to add the following data as comments. (Also known as metadata – data about data.)

```
//Name: <your name here>
```

```
//Date: <date finished>
```

```
//Program: <assignment name>
```

```
//Program Description: <what does this program do – this may be one line or an entire paragraph depending on the complexity of your program>
```

```
//Inputs: < what are the inputs to this program>
```

```
//Outputs: <what does this program produce>
```