CIS 162 Lab 3
Using Classes Defined in the Java API

Preparation
Do the following before arriving at lab:
- Read Ch 4

Objectives
After completing this lab, you should be able to:
- *instantiate* and use a Random object
- *use* Math static methods
- *use* String methods
- *use* the `NumberFormat` and DecimalFormat classes for attractive numbers
- Elegant source code should follow the GVSU Java Style Guide

Java API library
The following classes are defined in the Java API library that can be found on the internet or from the Help menu in BlueJ.

NumberFormat
The `NumberFormat` class can be used to display currency numbers as text/strings. It is not explained in the book but you can find more information in the Java API. The following example may be enough for you. You will need to insert the following line at the top of your class.

```
import java.text.*;
```

Code fragment	output

`NumberFormat fmt =`
`  NumberFormat.getCurrencyInstance(Locale.US);`
`double amount = 3.0111111;`
`System.out.println("Cost: " + fmt.format(amount));`
	`Cost: $3.01`

DecimalFormat
The `DecimalFormat` class can be used to display floating point numbers as text/strings with a specific number of digits to the right of the decimal place.

Code fragment	output

`DecimalFormat decFmt = new DecimalFormat ("0.00");`
`double num = 3.141543253`
`System.out.println(decFmt.format(num));`
	`3.14`

Random

The `Random` class can be used to generate random numbers. The following example generates a random number from 0 to 9 (not 10).

```
Random gen = new Random ();
int num = gen.nextInt(10);
```

Math

Refer to Ch 4 in zyBook.

Lab Activity #1 – Generate Login Name

Write a main method that prompts the user for a first name, a last name and a four-digit number (integer) on separate lines. Generate a login name that includes the first five letters of the last name, followed by the first letter of the first name and then the last two digits of the number (use the % operator).

- When working correctly, copy to the corresponding zyLab in Chapter 5

Sample Output

```
Enter first name: Jeremy
Enter last name: Johnson
Enter 4-digts: 6789
Your login name: JohnsJ89
```

Lab Activity #2 – Cylinders

Write a main method that prompts the user for two doubles that are the radius and height of a cylinder. Calculate the volume and the area, as given by following two equations, using `Math.pow()` and `Math.PI` and print the results. Print the results to one decimal place using `DecimalFormat`.

Volume = $\pi r^2 h$
Area = $2\pi rh$

- When working correctly, copy to the corresponding zyLab in Chapter 5 for testing

Sample Output

```
Radius: 5.2
Height: 8.1
Volume: 688.1 cubic inches.
Surface Area: 264.6 square inches.
```

Lab Activity #3 – Area of a Triangle

Write a main method to prompt the user for three numbers (doubles) that represent the side lengths of a triangle. Calculate the area of the triangle using `Math.sqrt()`. Print the area to three decimal places using `DecimalFormat`.

s = half the triangle's perimeter
area = the square root of `s(s-a)(s-b)(s-c)`

- When working correctly, copy to the corresponding zyLab in Chapter 5 for testing

Sample Output

```
Enter Side A: 3
Enter Side B: 3
Enter Side C: 1
The area of the triangle is: 1.479
```

Lab Activity #4 – Ordering Pizza

Write a main method to prompt the user for an integer that represents the number of large pizzas to be ordered ($9.99 each). Calculate the sub-total before sales tax. Calculate the total due by applying a sales tax of 6%. Use the `NumberFormat` to display currency (described above).

- When working correctly, copy to the corresponding zyLab in Chapter 5 for testing

Sample Output

```
How many pizzas? 3
Sub Total: $29.97
Total Due: $31.77
```

Lab Activity #5 – Random Ranges

Write a main method to prompt the user for two integers. Use the `Random` class to generate three numbers all within the range of low to high (inclusive).

- When working correctly, copy to the corresponding zyLab in Chapter 5 for testing

Sample Output

```
Enter low: 15
Enter high: 20
Random values: 20 19 15
```

Grading Criteria

This lab is worth 1 point in addition to the associated zyLabs.