**CIS 162 Lab 4**

**Using Classes Defined in the Java API**

**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 lines at the top of your class.

import java.text.\*;

import java.util.Locale;

|  |  |
| --- | --- |
| **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 df = new DecimalFormat ("0.00");  double num = 3.141543253  System.out.println(df.format(num)); | **3.14** |

**Random**

The Random class can be used to generate random numbers.

examples:

Random gen = new Random ();

* To generates a random int from 0 - 9

int num = gen.nextInt(10);

* To generates a random int between 38 and 59 (inclusive)

int x = gen.nextInt(59 + 1 - 38) + 38;

**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).

* Demo for your instructor or lab assistant and 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 = πr2h

Area = 2πrh

* 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.