CSC 130 Introduction to Computer Science

Lab Two

Objectives:

A. To use Java to write a program and execute it.
B. To import packages
C. To define and initialize variables
D. Prompt a user for input and accept input from the keyboard
E. To develop simple arithmetic expressions
F. To print output to the screen

Assignment:

Write a program called **LastNameFirstInitialLab2**. This program will have two sections. The first section will accept a measurement given in pints and then converts it to the equivalent number of (a) quarts, (b) gallons, and (c) liters. (quart = 2 pints, gallon = 8 pints, liter = 2.113383 pints). The second part of the program will have you playing with the increment operator, an augmented operator, and the pow method.

You will get the number of pints from the user and do the conversion to quarts, gallons, and liters. After you do the conversion, you will output the results as shown in the run screen. You will not worry about the number of decimal places shown. We will be looking at how to improve formatting later in this course.

Note: The identifiers QUARTS, GALLONS, and LITERS will be constants. These declarations lines will be under the class header line, but before the main method. These are constants; they would, therefore, be available to any method in the program.

For the second section of your program, after you calculate and display these conversions, you will do these things in order:

1. Use the increment operator to increase the value of pints by 1. You will then print out pints.
2. You will then use the augmented operator to increase the value of pints by three times and then print out pints.
3. Lastly, you will use the pow method to calculate $pints^3$ and then print that out. You *may* use this method within the print line.

Use the variable names shown in the design diagram.

Input	**Process**	**Output**
Pints	Calculate the equivalent Quarts, Gallons, and Liters Display the results Calculate Pints increased by 1 Display Pints Calculate Pints multiplied by 3. Display Pints Calculate Pints to the power of 3 Display the result	CalculatedQuartsEquiv CalculatedGallonsEquiv CalculatedLitersEquiv Pints

Further Instructions:

- Start by writing a documentation comment (javadoc comment) containing the integrity policy statement. You can find this in Canvas: **Modules > Help Files**. Under the statement, but still in the block, type your first and last name for the signature, press Tab and type the date. You will not need to use underlining.

- Make sure that you have comments on your program that show, at a minimum, your first and last name, the course name (CSC 130, Sec #), and the title of the program (Lab Two). You may choose to use single line comments or a multiline docstring. Sec # will be *your* section #.

- The comments will go under the import statements, but before the class header.

- Make sure that the run screen shows your first and last name, the course name (CSC 130, Sec #), and the title of the program (Lab Two). These lines will be under your variable definitions.

- **Test the program three times, using the test data of 1, 3, and 5 pints**

- **Make sure your program will run**.

To Submit this lab:

In Canvas, upload the Java file to the assignment. This will be the file called
LastNameFirstInitialLab2.java

Notes:

- Do not go above the objectives of the assignment. I will not expect to see any selection, iteration, or special formatting for example.
- Since you will be receiving input, you will need to import the Scanner class.
- Since you will be using the pow method, you will need to import the Math class.
- Make sure your program uses proper indentation and wise use of whitespace. You can select Source from the menu and then select Format. This will automatically help with indentation and some whitespace issues. However, check it yourself afterward to be sure it is as readable as possible.
- The grading rubric is at the end of the assignment.

Run Screens *(Your program needs to look exactly like these.)*

Run One with input of the number 1

Christine Kikuchi
CSC 130, Sec #
Lab Two

Enter a number of pints to be converted: 1

1 pints is equal to:
0.5 quarts
0.125 gallons
0.4731749995149957 liters

Now pints is equal to: 2.0

Now pints is equal to: 6.0

Now pints is equal to: 216.0

Run Two with input of the number 3

Christine Kikuchi
CSC 130, Sec #
Lab Two

Enter a number of pints to be converted: 3

3 pints is equal to:
1.5 quarts
0.375 gallons
1.419524998544987 liters

Now pints is equal to: 4.0

Now pints is equal to: 12.0

Now pints is equal to: 1728.0

Run Three with input of the number 5

Christine Kikuchi
CSC 130, Sec #
Lab Two

Enter a number of pints to be converted: 5

5 pints is equal to:
2.5 quarts
0.625 gallons
2.3658749975749784 liters

Now pints is equal to: 6.0

Now pints is equal to: 18.0

Now pints is equal to: 5832.0

Grading Rubric			
The program is saved as a Java file with the correct filename. + 1 points	The program is saved as a Java file with an incorrect filename. – .5 point	The program is not saved as a Java file, but has the correct filename. – .5 point	The program is not saved as a Java file and has an incorrect filename. – 1 points
The program uses proper indentation and wise use of whitespace. + 2 points			The program does not use proper indentation and wise use of whitespace. - 2 points
The program has the signed and dated integrity policy in a javadoc comment + 4 points.	The program has the signed and dated integrity policy as comments, but not a javadoc comment. + 2 points.		The program does not have the signed and dated integrity policy - 4 points.
The program has comments for your name, the course name, and the title of the program (Lab Two). + 4 points.	The program is missing one or more comments – 2 point.		The progr.am has no comments - 4 points.
The comments are under the import statements, but before the class header. + 2 points			The comments are not under the import statements, but before the class header. - 2 points
The program, when run, prints out the lines that are your name, the course name, and the title of the program (Lab Two). + 4 points.	The program, when run, is missing printing out some of the same lines that are used for the comments.– 2 points.		The program, when run, is missing printing out the same lines that are used for the comments - 4 points.
Both import statements are in the program: import java.util.Scanner; import java.lang.Math;. + 10 points.	Only the Scanner class import statement is in the program. + 5 points	Only the Math class import statement is in the program. + 5 points	Neither import statement is in the program: import java.util.Scanner; import java.lang.Math;. - 10 points
The 3 constants are declared correctly and are named with the names from the design diagram. + 5 points	The 3 constants are declared correctly but are not named with the names from the design diagram. + 2.5 points		The 3 constants are not declared correctly and are not named with the names from the design diagram. - 5 points
These declarations lines for the constants are under the class header line, but before the main method. + 2 points			These declarations lines for the constants are under the class header line, but before the main method. - 2 points
The variables are declared correctly and are named with the names from the design diagram. + 5 points	The variables are declared correctly but are not named with the names from the design diagram. + 2.5 points		The variables are not declared correctly and are not named with the names from the design diagram. - 5 points
Pints is accepted into the program and converted to a double. + 6 points	Pints is accepted into the program, but it is not converted to a double. + 3 points		Pints is not accepted into the program and converted to a double. - 6 points

Grading Rubric			
The quarts, gallons, and liters conversions are correctly done using the variable names from the design diagram. + 10 points	The quarts, gallons, and liters conversions are correctly done but do not use the variable names from the design diagram. + 7 points	The quarts, gallons, and liters conversions are not correctly done but are using the variable names from the design diagram. + 3 points	The quarts, gallons, and liters conversions are not correctly done using the variable names from the design diagram. - 10 points
The increment operator was used to change Pints value to be increased by one. + 5 points	Pints value was increased by one, but the increment operator was not used. + 1 point		The increment operator was not used to change Pints value to be increased by one. - 5 points
The augmented operator was used to change Pints value to be increased by the multiplication of 3. + 5 points	Pints value was increased by the multiplication of 3, but the augmented operator was not used. + 1 point		The augmented operator was not used to change Pints value to be increased by the multiplication of 3. - 5 points
The program calculated Pints to the power of 3. Pints was used as the base for a calculation to show Pints to the power of 3 using the pow method. + 10 points Bonus points – if the student creates a variable to use as the exponent. + 2 points.	The program calculated Pints to the power of 3. Pints was not used as the base for a calculation to show Pints to the power of 3 using the pow method. + 5 points	The program calculated Pints to the power of 3. Pints was used as the base for a calculation to show Pints to the power of 3 but the program did not use the pow method. + 3 points	The program did not calculate Pints to the power of 3. Pints was not used as the base for a calculation. The pow method was not used. - 10 points
The program's run was like the sample runs with the user input of 1, 3, & 5. + 25 points	The program's run was like the sample runs with only some of the user inputs. + 15 points		The program's run was not like the sample runs with the user input of 1, 3, & 5. - 25 points