CSCI 145 -- PA 2

Data and Expressions

Feel free to discuss and help each other out but does not imply that you can give away your code or your answers! You cannot work with a lab partner for this assignment. **You must always use the required template (JavaDriverTemplate.java or JavaClassTemplate.java from Canvas) and output "Author: Your Name(s)" or "Modified by: Your Name(s)" for each program as applicable**.

Perform as many exercises from chapter 2 of lab book as possible (ignoring applets), but the following lab exercises must be completed. You are not required to turn in written answers to various questions, but it is very helpful in understanding important concepts. You might see those questions on quizzes and exams. It is very important to be able read existing programs and follow the execution flow of those programs.

Exercise 1 -- Painting a Room

Exercise 2 -- Ideal Weight

Exercise 3 -- Lab Grades

Exercise 4: Write an application that inputs a *double* value representing a monetary amount. Determine the fewest number of coins needed to represent that amount, starting with the highest (assume that amount is between 0.00 and 0.99). Add a verification step to confirm that the amount from calculated coins is the same as the original amount (i.e., output conversion amount and compare the two amounts for equality). If the two amounts differ by 1 penny, you could leave your program as is and explain why that is the case (or you can try to fix it). However, if the two amounts differ by more than 1 penny then there is a bug in your program and you need to fix it. For example, if the entered value is 0.63 (sixty-three cents), then the program should print the following output. Try both 0.63 and 0.82.

```
Enter an amount between 0.00 to 0.99 --> 0.63<Enter>

The amount 0.63 is being converted to:
    2 quarters
    1 dimes
    0 nickels
    3 pennies

Actual conversion amount: 0.63
The two amounts are the same!
```

Question 1: What is the main difference between a variable and a named constant? Provide some good reasons for using named constants in a program.

Question 2: Provide a coding example of narrowing conversion and a coding example of widening conversion. Which one should be avoided? Explain.

Extra Credit (2 points): Perform **Base Conversion** exercise.

Fill out and turn in the PA submission file for this assignment (save as PDF format).
