AP Computer Science Name: ___________________________

Coding Assignment 2 – YOUR STORE **Due Date: Oct 20, 2021 - @ 12:01 a.m.**

- **You own an in-person store and your cash registers are all broken! You must write a program that helps the user checkout, pay, and receive change due.**

- First, display a welcome message to your store.

- Ask the user what items they are buying and the amount each item costs in dollars and cents. The program should use a loop to allow them to enter as many items as they want (Assume all costs are valid decimal amounts).

- Print their items/costs out.

- Total their items and show them the amount due, including tax. **Please use a tax rate of 6%.**

- Ask what amount they are paying. The amount paid can be exact change or whole dollar amounts. (test both of these cases)

- Check if the amount paid is more or less than the amount due. If they paid under, tell them how much more they owe and have them resubmit their amount paid (total). If they paid over, calculate how much change is owed.

- Tell the user how much change is owed and number of dollars, quarters, dimes, nickels, and pennies in change a customer would receive. You may assume all change will be 0 or a positive number with no more than two decimal places. If more than $1.00 is owed, the full value should be included in the number of dollars returned.

- Pay special attention to round off error. Your program should use division and modular division. To use modular division (and avoid roundoff error), **change amounts input to ints**! **Multiply by 100 then divide by 100.** Use escape characters such as tabs to format the output.

- **To format to two decimal places for this assignment, please see below code. You can embed this in your print statements along with other text output.**
  ```
  System.out.printf("%.2f", variableName);
  ```
  Example:
  ```
  System.out.printf ("Your total is:" + "%.2f", total);
  ```

OTHER TIPS

- Declare a counter and set = 0 to help with user entering the items and use this variable in a while loop. //int count = 0; Then decrease the counter in your loop. (careful of variable scope!). Or you can have user type "Done".
- Use 2 scanners
- Declare variables at the beginning such as *price, change, total*, etc. Set total = 0.
- Create an empty String called *receipt* to store the items that build a receipt to be printed out.

AP Computer Science   Name: ____________________

Coding Assignment 2 – YOUR STORE   **Due Date: Oct 20, 2021 - @ 12:01 a.m.**

Grading rubric:

<u>Out of 55 points:</u>

- Welcome message to your store (3 points) (be unique 😊)
- **Add a loop to the input so the user can purchase any amount of items** and compute totals and change, etc correctly. You may either do this by first asking how many items they have OR having them type "done" when done. (5 points)
- Program accepts customer items reprints those items and costs correctly (3 points)
- Total amount due computed correctly including tax (4 points)
- Accepting amount paid correctly (2 points)
- Check if the amount paid > amount due, if NOT ask to submit a larger amount (5 points)
- Change due computed correctly (5 points)
- Money amounts have 2 decimal places on display (5 points)
- Dollars, Quarters, Dimes, Nickels and Pennies correct (10 points)
- Code is commented: every line commented and header/program description/algorithm complete (5 points)
- Output has labels which are SPELLED correctly (2 points)
- Code is aligned, indented properly, sectioned nicely, no extra spaces at the end, and free from spelling errors: (5 points)
- Variables are user friendly to understand (must be descriptive) (1 point)

All submissions will be done through Schoology. Submit only the **(Name) CodingAssignment2.java** file through e-mail . Please <u>do NOT turn in code that does not COMPILE – it will NOT get any credit or prevent from losing points for resubmissions.</u> Make sure the shell file is used (do not change the class name). If you have questions about code, **ATTACH** your file to an email and send to pclaguna@fcps.edu with your question(s). I will not pre-grade it, but can answer specific questions you may have.

Sample Run 1 (bold is output, nonbold is user input):

```
Welcome to Laguna's store, so happy to see you!
How many items are you entering? 3
Please enter the name of the item:  Jeans
Please enter the cost of the item:  29.99
Please enter the name of the item:  Flip flops
Please enter the cost of the item:  8.97
Please enter the name of the item:  Sweatshirt
Please enter the cost of the item:  25.45
You purchased:
        Jeans          29.99
        Flip flops      8.97
```

```
          Sweatshirt      25.45
          Total            64.41
          Total with tax  $68.27
Please enter the amount paid:  70.00
Change owed:  1.73
Dollars: 1      Quarters: 2    Dimes: 2       Nickels: 0      Pennies: 3
```

Sample Run 2 (same inputs as above, change amount paid to exact):

```
You purchased:
          Jeans           29.99
          Flip flops       8.97
          Sweatshirt      25.45
          Total            64.41
          Total with tax  $68.27
Please enter the amount paid:  68.27
Change owed:  0.00
```

Sample Run 3 (same inputs, amount paid is less than amount due):

```
You purchased:
          Jeans           29.99
          Flip flops       8.97
          Sweatshirt      25.45
          Total            64.41
          Total with tax  $68.27

Please enter the amount paid:   65.00
You still owe: 3.27
Please enter the amount paid: 69.00
Change owed:  0.73
Dollars: 0      Quarters: 2    Dimes: 2       Nickels: 0      Pennies: 3
```

AP Computer Science Name: ___________________________

Coding Assignment 2 – YOUR STORE **Due Date: Oct 20, 2021 - @ 12:01 a.m.**

Formatting Numeric Print Output

Earlier you saw the use of the `print` and `println` methods for printing strings to standard output (`System.out`). Since all numbers are be converted to strings, you can use these methods to print out an arbitrary mixture of strings and numbers. The Java programming language has other methods, however, that allow you to exercise much more control over your print output when numbers are included.

The printf and format Methods

The `java.io` package includes a `PrintStream` class that has two formatting methods that you can use to replace `print` and `println`. Format specifiers begin with a percent sign (%) and end with a *converter*. The converter is a character indicating the type of argument to be formatted. In between the percent sign (%) and the converter you can have optional flags and specifiers. There are many converters, flags, and specifiers, which are documented in `java.util.Formatter`.

The following table lists some of the converters and flags that are used with printf.

Converters and Flags

Converter	Flag	Explanation
d		A decimal integer.
f		A float (decimal – use with doubles)
n		A new line character appropriate to the platform running the application. You should always use `%n` with printf, rather than `\n`. If not included, acts like just print and next print will appear on same line.
	08	Eight characters in width, with leading zeroes as necessary.
	+	Include sign, whether positive or negative.
	-	Left-justified.
	.3	Three places after decimal point.
	10.3	Ten characters in width, right justified, with three places after decimal point.

The following program shows some of the formatting that you can do with `format`. The output is shown within double quotes in the embedded comment even though the quotes will NOT appear on the screen:

```
      double pi = 3.141593;
      System.out.format("%f%n", pi);        // -->  "3.141593"
      System.out.format("%.3f%n", pi);      // -->  "3.142"
      System.out.format("%10.3f%n", pi);    // -->  "     3.142"
      System.out.format("%-10.3f%n", pi);   // -->  "3.142"
```

For more info or other options go to
https://docs.oracle.com/javase/tutorial/java/data/numberformat.html