PROG 110

Project 3
Restaurant Bill Calculator
75 points

Due: See Calendar
Use Assignment Tool

Objective: The Klingon Kafe tends to handle large business groups that typically agree to split the bill evenly amongst the diners. The application you will create will allow the server to enter specific data about a tables dining experience and display specific output about the cost for each individual, and also suggest different tipping amounts. For this project, you are expected to use loop(s) either pretest or posttest, and a 'for' loop. Use of variables for all calculations is required, and use the Write( ) method for the prompts.

Application Specification:

In your design of the interface, consider white space, correct spelling, and correct English grammar.
Solution Name: yourLastName Project3Sol (e.g. UnwinProject3Sol)
Project Name: yourLastNameProject3
Source File Name: BillCalc.cs, Class Name: BillCalculator

Follow the Software Development Standards for implementing the required naming conventions, whitespace, indentations, file documentation and other details.

The server (user of the application) will be displayed prompts asking for the following pieces of data:

```
Cost of entire meal (food only)
Cost of all beverages
Number of diners
```

Requirements:

Read the entire requirements and then plan the application. Analyze the requirements and make sure you understand the problem definition.

1. Include a brief introduction that explains the purpose of the application. Use identifying labels; in other words, data shouldn't be "hanging around", but clearly identified.
2. After the brief introduction, prompt the user for the pieces of data as listed above. Validate that the user has entered valid data. If the number is invalid, display a specific, helpful error message and redisplay the prompt. Continue prompting until the user enters valid data.
3. Pause the screen and let the user know that the calculations will start after they press any key, then clear the screen.
4. Based on the data the user provided, display a "table" with the following header information. An example of detailed data is shown below. Notice the alignment (left justified under the column heading).

```
Table Amounts
Food    Beverages  No of Diners
100.00  50.00      5
```

Then summarize the following information. The data comes from the calculations provided by the program:

```
Subtotal:      $X,XXX.XX
Taxes @ 8.9%:      XX.XX
Total Cost:     X,XXX.XX
$ per diner:      XXX.XX
```

5. After the summarized data, display a tipping chart based on the individual diner's amount from the range of 10% to 25% increasing by 5% along with their total cost. No dollar signs, but each number should display two decimal places, and commas when needed.

```
Tipping Table
Tip%   Tip Amt   Total Cost
0.10   X.XX      X.XX
0.15   X.XX      X.XX
0.20   X.XX      X.XX
0.25   X.XX      X.XX
```

   Challenge: show the tip percentages as whole numbers with a percent symbol after it (e.g. 10%, 15%, etc).

6. The user will be able to repeat entering different values by answering a prompt such as "Would you like to run another scenario? (Y or N): " The user will be allowed to enter an upper or lower case letter.

7. If the user replies Y, clear the screen and repeat starting at step 2.
8. If the user replies N, then clear the screen, display an ending message, along with letting the user know how to end the program.

Specifications:

1. You are required to use the Parse() method for data conversion.
2. Use *double* data type for all monetary variables.
3. If the user inputs invalid data, display a helpful, useful, informative error message.
4. Invalid data consists of numbers out of range, or no data.
5. The summary table is to have the values displayed with the decimal points aligned, Only the first value displayed in the table will display a dollar sign, the rest will not, but all values will display commas, and two decimal places.
6. The tipping table must use a 'for' loop to display the table, and to include the calculations for the tip amount and the new total cost to the individual.
   - Display the table heading and column headings
   - Inside the loop, calculate the tip amount (optional: calculate the new individual total cost)
   - Display the tip percentage, the tip amount, and the new total cost (you can do the addition in the Console.Writeline statement)
7. Use constants
8. Use loop(s) either pretest or posttest.
9. Use variables for all calculations
10. Use the Write( ) method for all prompts.

Hints for Success

- Review your application and check that the numbers make sense.
- Have a friend run your application; they may suggest changes to the interface for an easier interaction. *Double hint: I don't like to respond to redundant prompts.*
- Create a Test Plan
- If you have questions, please post on the discussion board under the appropriate topic, but do not post your code. In answering another student's question, do not post "answers" (code), but you may provide guidelines/hints on how to obtain the desired result.
- Start early and plan your time for questions in class and on the discussion board. Do not wait until the last minute to ask questions.

Follow the Program Development Life Cycle to plan, design, code, and test your application.

Memo Requirement

1. Create a Word document that will have your time sheet for this project that includes estimate, actual and total hours. Review the format as shown on page 7 of the Software Development Standards. For this project, if you added any "extras", detail them in the memo, and it is optional to state any other learning outcomes or concerns.
2. Save as *yourLastName*MemoP3 (e.g. UnwinMemoP3)

Turn in:

1. The complete Visual Studio solution you developed.
2. Place the memo outside the VS solution folder and submit all files in one Zip file named *yourLastName*P3 (e.g. UnwinP3.zip).

It is your responsibility to ensure that all files are submitted and that I don't receive a "shortcut", or missing a file. If I don't have the correct files, I cannot grade your project and therefore, you will receive a zero for the assignment.

Sample output – your text may differ, but make sure to display the required data and in table formats.

Input:

```
 ***  Welcome to Klingon Kafe and its Dining Bill Calculator.  ***
Enter the requested amounts for your table and
the calculator will do the rest.


Please enter the cost for all the meals: 100

Please enter the cost for all the beverages: 50

Please enter the number of diners: 5

Thank you for the information, press any key to see the calculations.
```

Output

```
Food        Beverages      No. of Diners
1.00        1.00           1

Subtotal:           $2.00
Taxes @ 8.9%:        0.18
Total cost:          2.18
$ per diner:         2.18


Tipping Table
-------------
Tip %     TipAmt     Total Cost
0.10      0.22       2.40
0.15      0.33       2.50
0.20      0.44       2.61
0.25      0.54       2.72

Would you like to run another scenario? (Y or N):
```