CS115 INTRODUCTION TO COMPUTER PROGRAMMING
Programming project #1

INTRODUCTION

In this programming assignment you are required to understand the problem definition given below and write two separate electronic documents as follows:

1) External documentation of the problem definition, analysis, and program design.
2) A Python program
3) Record of program run

PROBLEM:

When a purchase is made, tax is added to the amount of purchase calculated as follows:

StateTax = 0.05 * PurchaseAmount
CountyTax = 0.025 * PurchaseAmount
TotalOfSale = PurchaseAmount + StateTax + CountyTax

Write a program that will display a message to ask the user to input the amount of purchase. The program will then read the amount of purchase from the keyboard. The program should then compute the state and county tax. Assume the state tax is calculated at 5 percent and the county tax is 2.5 percent. The program will display, formatting output amounts to 2 decimal places a message saying:

```
Amount of purchase      x,xxx,xxx.xx
State tax                  xx,xxx.xx
County tax                 xx,xxx.xx
Total of sale           x,xxx,xxx.xx
```

Use the Python *format( )* function to specify decimal places to display.

THE PYTHON PROGRAM

The program should do what is specified in the PROBLEM section above. The program should have the following features:

1) The first few lines of your program should be comments that state:
   - the program name,
   - the author's (your) name,
   - date the program is released,
   - a brief description of the main task performed by the program.
2) Your program should have meaningful variable names (names should not be single letter or abbreviations for example **st** is not a good name but **StateTax** is a good name). There should be a comment on each major function point: input, calculation, output.

EXTERNAL DOCUMENTATION

See In the Spotlight on pages 58 and 62 for an example of external documentation [minus the program]

Type a report of your solution in a Word or OpenOffice Writer document. You should structure your document in four clear sections each with a subheading as follows:

1. PROBLEM DEFINITION
   The problem definition comes here. This is a summary of the PROBLEM section above.

2. ANALYSIS
   Give the variables that you have identified to hold output data and explain the type of data for each variable. Similarly, give variables to hold input data and describe them. If any calculations will be performed, give variables to store results of formulas. Also give variables to hold constants.

   Give formulas to convert input data to output data using variable names that you identified. Do no copy the formula given in the PROBLEM section above.

3. DESIGN
   Give the algorithm in pseudocode form of the step by step statements to carry out the required programming task in English phrases. Explain the reasoning of the structure and logic of your program. You may use diagrams such as structure charts and flowcharts in addition to the pseudocode to present hierarchy and logic of your program. Pseudocode should not be in Python.

4. IMPLEMENTATION
   What was the platform and programming environment used? Name the Operating System and compiler. How did you test your program? Give the data used to test the program. Did you encounter any unusual situations when running the program (For example, what happens when an alphabetic character is input instead of an account number)?

*** You should not put your Python program in the external documentation ***

PROGRAM RUN RECORD

Run your program and save the program run session. For example, if you use IDLE you can click on **File** on the menu and choose **Save as** … then change the Save as type to **Text files** before typing the file name and clicking on **SAVE**.

SUBMISSION METHOD

a) Upload to Blackboard a copy of your external documentation.
b) Upload to Blackboard a copy of your program (not MS Word or PDF or RTF or WPS formats but as generated by your editor saved with a .py extension).
c) A text file containing the record of the program run session.

You will click on the black words “Programming project 1” in the “Programming projects” area on Blackboard and then click on “Browse My Computer” then attach your external documentation document, again click “Browse My Computer” and attach the program, and again click “Browse My Computer” and attach the record of program run before finally clicking SUBMIT.

GRADING

This program will be graded out of 100 points distributed as follows:

ITEM	MAX. POINTS
External documentation	30
Style: comments, meaningful names, indentation, functions	10
Program compiles error free	30
Program works correctly	30

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