COP 2930 - Individual Programming Assignment #1

Due date: Please consult WebCourses for your due date/time

Objectives
1. To give students practice at typing in, compiling and running simple programs.
2. To learn how to read in input from the user.
3. To learn how to use assignment statements and arithmetic expressions to make calculations

Problem A: Take Home Pay (pay.py)
Often times, when you get quoted a salary for a job, it can be misleading. Typically, the quoted salary is the "gross salary." Unfortunately, before you ever get your paycheck, money is taken out of the gross salary to account for Social Security, Medicare and other taxes. Let's define your effective tax percentage to be the percent of your gross salary that is taken away from you for various purposes before you ever receive your paycheck. What you finally receive in your pay check is known as your net salary.

Write a Python program that asks the user to enter their gross salary and their effective tax percentage, and prints out the user's net salary.

For example, if the user's gross salary is $50,000.00, and their effective tax percentage is 20%, then their net salary would be $40,000.00. Please read in both values as floating point numbers, to allow for non-integer salaries and tax percentages.

Input Specification
Note: It is guaranteed that whoever uses your program will adhere to these specifications. This means that you do NOT have to check for them!

The user's gross salary will be a positive real number less than or equal to 1000000.00.

The user's effective tax percentage will be a non-negative real number less than or equal to 100.

Output Specification
Produce a single line of output with the following format:

```
You actually get to take home $D.
```

where D is your net pay in dollars. Don't worry about the number of digits that print after the decimal.

Output Sample

Below is one sample output of running the program. **Note that this sample is NOT a comprehensive test.** You should test your program with different data than is shown here based on the specifications given above. In the sample run below, for clarity and ease of reading, the user input is given in *italics* while the program output is in **bold**. (Note: When you actually run your program no bold or italics should appear at all. These are simply used in this description for clarity's sake.)

Sample Run #1

What is your gross pay?
50000.00
What is your effective tax percentage?
20.0
You actually get to take home $40000.0.

Sample Run #2

What is your gross pay?
57432.28
What is your effective tax percentage?
16.6
You actually get to take home $47898.521519999995.

Note: Your answer doesn't need to match exactly to what is shown above, but it should be extremely close, numerically.

Problem B: Speed Limit Conversion (speed.py)

In the United States, speed limits are given in miles per hour, but in many other countries they are given in kilometers per hour. Go online to look up the conversion factor between the two and use this to write a program that converts a speed limit from miles per hour to kilometers per hour.

Input Specification

Note: It is guaranteed that whoever uses your program will adhere to these specifications. This means that you do NOT have to check for them!

The input value representing a speed in miles per hour will be a non-negative real number less than 100.

Output Specification

Produce a single line of output with the following format:

```
The speed limit is K kilometers per hour.
```

where K is the converted speed in kilometers per hour. Don't worry about the number of digits that print after the decimal.

<u>Output Sample</u>
Below is one sample output of running the program. **Note that this sample is NOT a comprehensive test.** You should test your program with different data than is shown here based on the specifications given above. In the sample run below, for clarity and ease of reading, the user input is given in *italics* while the program output is in **bold**. (Note: When you actually run your program no bold or italics should appear at all. These are simply used in this description for clarity's sake.)

<u>Sample Run #1</u>
Enter a speed in miles per hour.
55
The speed limit is 88.5137 kilometers per hour.

<u>Sample Run #1</u>
Enter a speed in miles per hour.
99.93
The speed limit is 160.82134620000002 kilometers per hour.

<u>Problem C: Your Own Problem!</u>
As we've learned, we can use variables and assignment statements to solve certain types of problems. See if you can find a problem you've either had in real life or in some class, and write a program to automatically solve the problem for you. In your comments, clearly describe what the problem is and how your program solves it. Also, make sure in the comments that it's clear how to use your program. **Name your file anything you'd like to.**

<u>Restrictions</u>
Please IDLE 3.6 (or higher) to develop your program. Write each in a separate file with the names specified previously, **<u>pay.py</u>** and **<u>speed.py</u>**.

Each of your **three** programs should include a header comment with the following information: your name, course number, assignment title, and date. Also, make sure you include comments throughout your code describing the major steps in solving the problem.

<u>Grading Details</u>
Your programs will be graded upon the following criteria:

1) Your correctness

2) Your programming style and use of white space. Even if you have a plan and your program works perfectly, if your programming style is poor or your use of white space is poor, you could get 10% or 15% deducted from your grade.

3) Compatibility to IDLE.