CS 1301 – Summer 2009

Pair Homework 2 – Conversions/Tip Calculator

Due: Friday, May 22nd at 6 PM

Out of 100 points

Files to submit: 1. hw2.py

You will be writing several functions, but they will all be saved in one file: hw2.py. Please save all of the functions in this one file or you will lose points.

For Help:

- TA Helpdesk – Schedule posted on class website.
- Email TAs

Notes:

- **Don't forget to include the required comments and collaboration statement (as outlined on the course syllabus).**
- **Do not wait until the last minute** to do this assignment in case you run into problems.
- If you find a significant error in the homework assignment, please let a TA know immediately.

Part 1 – Conversions (45 pts)

Section A – Mass (15 pt s)

For part A, you will write a function called **mass()** which takes in a value in kilograms and coverts that value into stones. For reference, there are 0.157 stones (yes, that's a real unit!) in 1 kilogram. Please **return** the value. Save this function in your **hw2.py** file as well.

Sample Output:

```
>>> mass(4)
0.628
>>> mass(8)
1.256
```

Section B – Volume (15 pts)

In this section, you will need to convert volumes. There are 2.11 US pints in one liter.

Write a function called **volume()** that takes in a value in liters and converts it to US pints. Since we want to know what we're dealing with, **print** the value out with a nice little sentence explaining the conversion that just happened. Please print the values to 2 decimal places. See the sample output below. Save this function in your **hw2.py** file as well.

Sample Output:
>>> volume(1)
There are 2.11 US pints in 1.00 liters
>>> volume(4)
There are 8.44 US pints in 4.00 liters

Section C – Monkeys (15 pts)

Just like the previous two problems, it's conversion time. One average spider monkey is
equal to 37.62533333333 hockey pucks. Seriously. Write a function called **monkeys()**
that takes in a number of monkeys and **prints** out the resultant conversion into hockey
pucks. Please round the number of hockey pucks to 4 decimal places. See the sample
output for more clarification. Save this function in your **hw2.py** file as well.
Sample Output:
>>>monkeys(3)
There are 112.8760 hockey pucks in 3.000000 average spider monkeys
>>> monkeys(11.57)
There are 435.3251 hockey pucks in 11.570000 average spider monkeys
Source for the conversion factor: http://www.weirdconverter.com/
You should totally go there and play around with conversions that don't make any sense.
Impress your professors! Entertain your friends! Dazzle your family!

Part 2 – It's Math Time! (55 points)

So you've been up all night playing Rock Band™ with your friends. Well, rocking out
hardcore always makes one tired, so you decide to go grab some food. It being nearly 3
am, the only place is the great institution of Waffle House. However, you're spent from a
night of constant awesomeness, and realize you just won't be able to compute the
appropriate tip amount for the waitress in your head. For some reason, though, the part of
your brain that writes Python functions is super focused and ready to go, so you decide to
whip out your laptop and write a Python program to handle the tip calculations for you.
(Yes, you brought your laptop to Waffle Hours with you. You are a Tech student, after
all.)
You program will also need to be able to handle tax.
-Write a function called **tipCalculator()** that prompts the user for the bill amount and the percent that they want to
leave for the tip. **Do not include the dollar sign or percent sign when entering the numbers!**

-Calculate the tax (**always 7.8%**), the tip (percent of bill amount, **excluding** tax), and the total bill.
-Remember to divide the percentages by 100 when multiplying. Here, it is important to
remember how Python handles division.
-You are expected to round the your tip to the next dollar by use of the math.ceil() function. Basically, math.ceil() always rounds the number up to the next integer. **Do not forget to import math when using functions from the math module!**
For example:

```
>>> math.ceil(4.51)
5.0
>>> math.ceil(6.7)
7.0
>>> math.ceil(3.2)
4.0
```

-Round the tax to the nearest cent by use of string formatting. Remember, you're working
with money, so how are dollar amounts usually presented?

Sample output:

```
>>>tipCalculator()
How much is the bill before tax and tip? 7.80
What percent tip do you want to leave? 15
Tax is $0.62
Tip is $2.00
Total is $10.42
```

Grading Rubric

Part 1 – Conversions – 45 points

- Part A – 15 points
  - Function named correctly (mass) – 5 points
  - Performs correct conversion – 5 points
  - Returns the value – 5 points
- Part B – 15 points
  - Function named correctly (volume) – 5 points
  - Performs correct conversion – 5 points
  - Print statement containing values to 2 decimal points – 5 points
- Part C – 15 points
  - Function named correctly (monkeys) – 5 points
  - Performs correct conversion – 5 points
  - Print statement containing values to specified decimal points – 5 points

Part 2 – Tip Calculator – 55 points

- Gets input from user – 5 points
- Input is cast correctly – 7points
- Tax is calculated correctly – 7 points
- Tip is calculated correctly – 7 points

Total is calculated correctly – 7 points
Uses math.ceil() as needed – 7 points
Outputs are correct – 15 points (5 each for tax, tip, and total)

For a grand total of 100 possible points.
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