

CS 1301

Pair Homework 2 – Conversions

Due: Monday January 27th, 2014, before 11:55pm

Out of 100 points

Files to submit: 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. This is a pair programming problem! You are expected to work with the person you have been paired with in class, and you are both responsible for submitting the exact same code to T-Square. Your pair may collaborate with other students in this class. Collaboration means talking through problems, assisting with debugging, explaining a concept, etc. You should not exchange code or write code for other pairs. Collaboration at a reasonable level will not result in substantially similar code. For pair programming assignments, you and your partner should turn in identical assignments.

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/Magic (50 points)

Section A - Currency (15 points)

You are an investor who after following Bloomberg for 5 years decided that it would be a good idea to invest in Moroccan Dirhams. You would like to know how much Dirhams you would get in exchange for your life savings. You will write a function called `currency()` which takes in a value in Dollars and converts the value to Dirhams. For reference, 0.27 Dollars gives you 1 Dirham. Please **return** the value. Your answer doesn't need to be exactly 2 decimal places for this problem.

Sample Output:

```
>>>a = currency(25)
>>> print(a)
92.59
>>>b = currency(10)
>>>print(b)
37.04
```

Section B - Puppies (15 points)

You were the lucky winner of magical seeds that grow into puppies. You are really excited, however, you have limited space to keep puppies. Therefore, you wish to know how many puppies a certain amount of magical seeds will grow. You know that one seed can grow 2 puppies at a minimum and 5 at a maximum. Make a function that accepts an integer (number of magical seeds) as a parameter and that will **print** the minimum and maximum amount of puppies you could get. Remember that your answer values must be **integers**, not floats.

Sample Output:

```
>>> puppies(5)
You can get a minimum of 10 puppies and a maximum of 25 puppies with 5
magical seeds.
>>> puppies(8)
You can get a minimum of 16 puppies and a maximum of 40 puppies with 8
magical seeds.
```

Section C - Making Tea(20 points)

You and your friends need to help your grandma with her tea party. She has told you what tea is her favorite and will later tell you how many people will be joining her. Your job is to make sure to buy enough tea for her party. You know that 1 ounce of tea leaves can make 3 cups of tea and each person drinks only 1 cup of tea. Write a function called **teaParty()** that will take in the number of people your grandma will invite and **prints** out the number of ounces you should buy. Make sure to format your answer with only **3 digits** after the decimal point.

Sample output:

```
>>>teaParty(4)
```

You should buy 1.333 ounces of tea.

```
>>>teaParty(7)
```

You should buy 2.333 ounces of tea.

Part 2 - Complex Functions (50 points)

Section A - Sale! (25 points)

The gaming world has gone mad and a global sale has been made on all your favorite games. You are absolutely thrilled to get your hands on a few new titles, but you must first make sure to pay off your rent and food. You know you use 20% of your monthly income in food and 35% on rent. Your job is to make a function named **moneyLeft()** that will take as a parameter your monthly income and will **print** how much money you have left to spend after paying rent and food. Remember to format your answer to exactly **2 digits** after the decimal point.

Sample output:

```
>>>moneyLeft(425)
```

You have 191.25 dollars left to spend.

```
>>>moneyLeft(533.56)
```

You have 240.10 dollars left to spend.

Section B - Prepare for Liftoff! (25 points)

Congratulations! You have been selected to take a ride on the International Space Station! You do not know how many orbits you will remain in space for, but you know that it will be at least a few days. In order to keep yourself from

dying of boredom, you have been allowed to bring your iPad with you. The problem is, you need to bring extra batteries with you for the ride. By doing some quick research, you learn that it takes the ISS 1.51659999913 hours to complete one orbit around the Earth. You know from experience that your iPad battery lasts 9 hours before it needs to be replaced.

- Write a function called **batteriesCalculator()** that calculates how many batteries you will need to bring along for the ride using the given conversion rates. The function needs to take an **input** from the user asking how many orbits they will be in space.
- Your function should print the number of batteries needed twice. For the first time, the number should not be rounded and should be printed by itself. For the second time, the number should be rounded, **not be a floating point number** (no decimal points) and included printed out in a sentence (see sample interaction).
- Your function should also return the rounded number of batteries.
- You are expected to round the number of batteries to the next integer 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
```

Sample interaction:

```
>>>c = batteriesCalculator()
>>>print(c)
Enter 100 for the amount of orbits...
Output should be:
```

16.8511111014

You will need to bring 17 batteries to last 100 orbits.

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Rubric

Part 1 - Conversions/Magic (50 points)

currency() - 15 points

Function named correctly (currency)	5 points
Performs correct conversion (float division)	5 points
Returns the value	5 points

puppies() -15 points

Function named correctly (puppies)	5 points
Performs correct conversion (multiplication)	5 points
Prints correct statement with integers	5 points

teaParty() - 20 points

Function named correctly (teaParty)	5 points
Performs correct conversion	5 points
Value has exactly 3 decimal places	5 points
Prints correct statement statement	5 points

Part 2 - Complex Functions (50 points)

moneyLeft() - 25 points

Deals correctly with float input	5 points
It correctly performs the conversion	10 points
Answer has exactly 2 decimal places	5 points
Prints the correct statement	5 points

batteriesCalculator() - 25 points

It correctly asks for user input	5 points
Correctly imports math and uses math.ceil()	5 points
Performs the correct conversion	5 points
Correctly prints both the float value and the statement	5 points
Returns the rounded value	5 points