CS 1301 – Spring 2009

Homework 3 – Getting to know your robot

Due: Wednesday, Jan 28th at 6 PM

Out of 100 points

Files to submit: 1. hw3.py

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 – Dance, robot, dance! (55 points)

Hopefully by now, you've gotten your robot out of the box and made friends with it (or at least acquaintances); given it a name and a back story. Well, how about now you take it out to a dance?

Of course, you'll have to teach your robot to dance. Using the movement functions:

http://wiki.roboteducation.org/Myro Reference Manual#Movement Functions

have your robot do a little dance. The dance should last for at least seconds, and contain at least 3 distinct dance moves, ie don't just go back and forth for 30 seconds; vary the dance a bit. Pretend you've got a spastic robot. In addition to the movement, your robot should also make some noise! The **beep()** function is very helpful – it allows the robot produce various tones. You are allowed (and encouraged) to make your own helper functions that contain individual dance moves.

Write your dance as a function called **dance()**, and save it into a file called **hw3.py**. As always, please name your file exactly as requested.

Part 2 - Conversions (45 Pts Total, 15 for each subpart) Section A - Area (15 pts)

For the next 3 parts, you will be writing small functions that convert between the Standard (US) and Metric measuring systems. For part A, you will write a function called **area()** which takes in a value in US Standard square inches and coverts that value into the Metric square centimeters. For reference, there are 6.45 square centimeters in one square inch. Please **return** the value. Save this function in your **hw3.py** file as well.

Sample Output: >>> area(2) 12.9 >>> area(5) 32.25

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 **hw3.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 **hw3.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 3 – Turning it in

Once you're done, please submit ONE file, hw3.py to T-Square. If you submit each function in a separate file, you will lose 10 points! The assignment is due Wednesday, Jan 28th before 6pm. If you're late, but turn it in before 6pm on Friday, you will lose 10%. We will not accept submissions after Friday.

Remember – if there are errors in a part of the homework, you will lose 50% credit for that particular part. If your file fails to run at all, you will lose 50% credit for the entire homework. Please test your code thoroughly!

Part 4 – Grading Rubric

Part 1 - Dance - 55 points

Function named correctly (dance) -5 points

Dance lasts for at least 30 seconds – 20 points

Contains at least 3 distinct moves – 15 points

Robot beeps -10 points

Creativity – 5 points

Total for part 1: 55 points

Part 2 – Conversions – 45 points

Part A - 15 points

Function named correctly (area) – 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

Total for part 2: 45 points

For a grand total of 100 possible points.

You can earn up to 5 points bonus [discretion of the TAs] for extra creativity/general awesomeness, for a possible total of 105/100.

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