

CS 1301 – Fall 2008

Homework 3 – Maths R Us

Due: Friday, September 12th, 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.
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Part 1 – Tip Calculator (30 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 files 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.

You program will also need to be able to handle tax.

-Write a function 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 8%**), the tip (percent of bill amount, excluding tax), and the total bill.

-Remember to divide the percentages by 100 when multiplying.

-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.

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.

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
```

Save your function into a file called **hw3.py**. Remember to name your file exactly!

Part 2 – Textbook Pricing (40 Points)

Well, now that the fun Rock Band times are over, you must begrudgingly start on your many homework assignments that have been piling up. However, since you've been in video game mode, you haven't even bought books yet! Guess it's time to head to the bookstore.

You will need to create **three** functions for this assignment. The first function is our main function, called **textbook()**, taking no parameters and returning nothing. Upon running `textbook()` the user should be prompted for the option to BUY a textbook or SELL back a textbook ("b" for buy, and "s" for sell). Also, since good economics is important, the program should also assume (**prompt for** and appropriately store) that the user has done some research and has an estimate cost of the book s/he is trying to buy or sell back.

Unfortunately, the textbook stores aren't as nice as one would hope and add 10% to your estimated cost if the price is less than fifty dollars, 15% if your estimated cost is between fifty (inclusive) and one hundred dollars, and adds a whopping 20% to the estimated cost if the price is over one hundred dollars when you're trying to buy a book. When selling back a book, the same discounts are true, but reversed (ex. if you were trying to sell back

a book with an estimate cost of fifty dollars, the bookstore would buy back your book for 15% less than your estimated cost etc.)

Once you've determined the price that the book store will sell the item for, or the price at which you will sell the book back for, you will need to print out that information to the user. Since we have two options (buying and selling) we will create our two smaller functions [**buyString(price)** and **sellString(price)**], which will be called various times in the `textbook()` function. Both functions should take in a parameter, the price which to display, and then print out a statement relevant to the situation. (ex. if the user was buying a book with an estimated cost of \$100, the screen should print "The price you will pay for the book is \$110").

Remember concatenation rules.

Save these functions in your **hw3.py** file!

Sample Output:

```
>>>textbook()
Would you like to Buy (b) or Sell (s): b
What do you estimate the cost of the book to be? 75
The price you will pay for your book is $86.25
>>> textbook()
Would you like to Buy (b) or Sell (s): b
What do you estimate the cost of the book to be? 120
The price you will pay for your book is $144.0
>>> textbook()
Would you like to Buy (b) or Sell (s): s
What do you estimate the cost of the book to be? 75
The price you will sell the book for is $63.75
>>> textbook()
Would you like to Buy (b) or Sell (s): s
What do you estimate the cost of the book to be? 20
The price you will sell the book for is $18.0
```

Part 3 – Birthday Planner (30 points)

So, after you and your friends have stayed up all night doing homework in all those textbooks you just bought, you want to go have some fun. Well, since you also sold back a couple books, you've got some cash, and it just so happens that one of your friends is having a birthday. So you all decide to go out, but you just can't agree on a place. So, let's ask Python for help!

For this birthday assignment, write a function called **birthday()**, which

takes in two parameters, **name** (as a string) and **currentAge** (should be an integer). **However, you'll need to remember to add one to their current age somewhere in your function, as that is how old your friend will be turning on their birthday!** Where to go to celebrate will be based on this age.

Age Cut-offs:

- If the new age is **less than or equal to 6**, take the person to Chuck-E-Cheese
- If the new age is **greater than 6 but less than or equal to 17**, take the person to the mall.
- If the new age is **greater than 17 but less than or equal to 26**, take the person to The Vortex.
- If the new age is **greater than 26 but less than or equal to 50**, take the person salsa dancing.
- If the new age is **greater than 50**, go to the Opera.

We also want to check and see if the new age is a special birthday, meaning, the birthday person is turning 10, 20, 30, etc. If so, we want to remind the user to get a card for the celebration.

Again, save this function in your **hw3.py** file!

Sample Output:

```
>>> birthday("Melody", 5)
For the 6 year old, take Melody to Chuck-E-Cheese!!
>>> birthday("Sam", 19)
For the 20 year old, take Sam to The Vortex!!
Also, for Sam's 20th birthday, be sure to get a special
card.
>>> birthday("Steve", 46)
For the 47 year old, take Steve salsa dancing!!
```

Part 4 – Grading Breakdown

#1 – Tip Calculator

- File Named Correctly.....5 points
- Gets input from user.....5 points
- Tax Calculated and Displayed Correctly...5 points
- Tip Calculated and Displayed Correctly...5 points
- Total Calculated and Displayed Correctly.5 points
- Uses the math.ceil() function.....5 points

Total: 30 points

#2 – Textbook Pricing

- buyString and sellString functions correct.....10 points (5 for each one)
- Correctly adjusts the price.....10 points
- textbook() function conditionals are correct.....15 points
- Casts the estimated cost/does math with floats....5 points

Total: 40 points

#3 – Birthday Planner

- Correctly calculates new age of the person.....5 points
- Age conditions are correct.....10 points
- Print statements are correct.....10 points
- Prints card reminder for special birthdays.....5 points

Total: 30 points

Grand Total: 100

As always, you can earn up to 5 points bonus for going beyond the scope of the homework and doing something nifty keen. [Hey, the 1950s called, they want their slang back.]

Part 5 – Turning it in

Please save all 5 functions (tipCalculator, textbook, buyString, sellString, and birthday) into ONE file, **hw3.py**! You will lose 10 points if you submit each file separately!

Submit **hw3.py** to T-Square by **Friday, September 12th at 6pm**. You can turn it in before Monday, September 15th for 10% off. We will NOT accept any submissions after Monday at 6pm!

Portions adapted from the Summer 2007 Homework

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