Lab Exercise 2 Part B
Focus: Arithmetic expressions, selections, repetitions
Point value: 10 points
% of course grade: 3%
Cross-disciplinary connections: Business, Simple Accounting, English, Math, Logical problem solving, Critical thinking

Farmer Suzy has a beautiful farm on ten acres just outside Austin. She raises chickens, grows vegetables, and has several milking cows. She has tied up with the Lakeline Farmers Market to set up a farm stall to sell eggs and fresh produce. Since she is unable to sell raw milk outside the farm due to regulatory restrictions, she asks customers who want raw milk to come to her farm and buy it during the week. Needless to say, she cannot do all this on her own so she has a trusted, hired farm hand named Zach. She is a tech savvy farmer and has hired you to write her a small, interactive application that will help her determine her profits for one weekend and estimate an annual profit.

Suzy's farm produce is limited to tomatoes and sweet potatoes. Three mornings a week, Suzy collects fresh eggs. She and Zach fill up egg cartons each day, Every Saturday, she goes to the Lakeline Farmer's Market and sells the eggs and vegetables. She charges $6 for a carton containing a dozen eggs. Customers love the delicious, fresh, un-pasteurized eggs and her organic produce!

The following information is important as you work through this problem:

What Does Suzy Eat?

1. Suzy keeps one dozen eggs for herself and one dozen for Zach
2. After she has filled the cartons, any leftover eggs also go to Suzy. For example, if she collects 142 eggs this week, then she will distribute those eggs as follows:
   a. One dozen eggs for her and a dozen for Zach. That leaves behind 118 eggs. She now fills up the cartons with the eggs. Each carton takes a dozen eggs so she will have 108 eggs in nine cartons leaving behind 10 more eggs for Suzy. Remember Farmer Brown?

Suzy's Revenue Sources

1. Suzy sells tomatoes for $3.50 per pound and the sweet potatoes for $1.25 each piece.
2. She has 25 chickens and the yield is about 30 eggs per chicken per week
3. Each carton holds a dozen eggs and she sells each carton for $6

a. She sells all the cartons she carries to the Market every week – nothing is ever left over

4. She sells raw milk per week at $11 per gallon to regular customers who drive up to her farm to get the milk

Suzy's Business and Operating Expenses

1. Suzy spends $0.25 per chicken per week on chicken feed
2. She spends $0.22 per chicken per week on the upkeep of the chicken coop
3. She has 6 cows and spends $12 per cow per week on cow maintenance
4. Suzy spends $20 per week on her vegetable farm
5. She pays a commission to the Farmer's Market Association to put up her farm stall – this commission is 1% of the total sales
6. Zach works works 15 hours a week for her at $10.50 per hour
7. Another operating expense for Suzy is gas for her truck:
   a. There are two ways to get to the Farmer's Market from Suzy's farm – the mountain road (11.75 miles) and the river road (7.22 miles). The river road is much shorter but is closed very often due to the threat of flooding
   b. Suzy's truck has an astoundingly high miles-per-gallon average of 7.5 MPG
   c. Gas costs $3.199 per gallon
   d. The formula for this calculation is simple: Miles traveled divided by the MPG of her truck multiplied by the gasoline rate
8. Net profit takes into account all revenues and all expenditures

This is not a complicated problem – it has to be solved in steps.

You MUST solve this with paper and pencil first otherwise you can get lost.

Take a moment to think: what do you need to know to solve this problem? Where/how can you find this information?

When you solve programming problems, the above two questions are very important. Since this is an early lab, I will give you very specific instructions. However, in later programming classes and later labs you will be required to find a lot of this information yourselves.

For this lab you will:

1. Input the number of eggs collected during the week. Do some error checking here. Suzy cannot enter a number less than 1 or greater than 750. You must use a repetition structure to do this. Give her a fixed number of tries and end the program if she still has not entered the correct value in the allotted tries
2. Input the quantity of veggies and milk sold
3. You will input the road Farmer Suzy will take to the Farmer's Market – remember she goes to the farmer's market but she also has to come back. Keep that in account when you are calculating the miles traveled
4. Calculate:
   a. The number of cartons Suzy will cart to the Farmer's Market keeping in mind that she keeps two dozen eggs for herself and Zach
   b. The total number of eggs Suzy gets to keep (one dozen plus whatever is left over from the cartons)
   c. The gross proceeds from the sales of eggs, veggies, and milk
   d. Think about it: does the commission paid to the farmer's markets count as an expenditure? Will you also calculate commission on milk sales?
   e. Zach's salary
   f. Maintenance expenses for the cows, chickens, and the veggie farm
   g. A sum total of the expenses Suzy has incurred
   h. A sum total of her sales including milk, eggs, and veggies
   i. The weekly profit
5. Can you now forecast the annual profit for Suzy if you know a weekly profit? What assumption can you make here? You can assume that she sells about the same quantities every weekend.

Notes about this assignment

1. For the error checking, you must have a loop

2. You may need to use accumulator and counter variables in this assignment. See these useful links:
   a. http://interactivepython.org/runestone/static/thinkcspy/Functions/TheAccumulatorPattern.html
   b. https://www.youtube.com/watch?v=prNzO_vtPvA
   c. You can check out my videos at: https://www.youtube.com/user/akahlonACC/videos - Some of these videos are about C++ but the concept of loops is explained in at least 4 of them.
3. Explore the modulo (%) and the integer division (//) operators in Python. See the following useful links:
   a. https://docs.python.org/2/reference/expressions.html#binary-arithmetic-operations
   b. https://youtu.be/b5cb_nfDyyM and https://youtu.be/3mKiGjIBiAo
4. This program requires many, small, independent steps to be completed – so work in sequence and with care.
5. There is a saying in programming: "Hours of planning can save you weeks of programming." There are several variations of this but the idea is that you must plan your solution and understand the requirements carefully. This figure is self-explanatory!

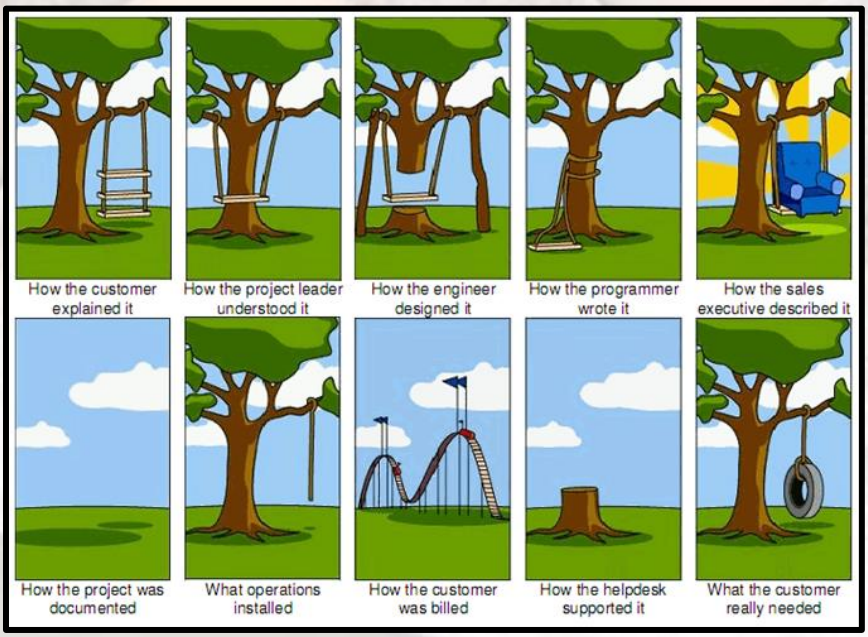

Figure 1 Understand the specs!

6. Review the naming conventions for labs. Use that to save this file and submit it to Blackboard

Disclaimer: At the Cypress Creek campus, we have a Professor Suzy who raises chickens. She brings delicious, freshly picked eggs to the campus for her fellow faculty members. Any resemblance of Farmer Suzy to Professor Suzy is purely coincidental and intended!

Sample Output

```
Python 3.6.1 (v3.6.1:69c0db5, Mar 21 2017, 18:41:36) [MSC v.1900 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
 RESTART: //cypfileserver/homedirs/AKahlon/Documents/ACC Classes/Spring 2018 Class Prep-20180213T200852Z-001/Spri
ng 2018 Class Prep/farmerSuzyS18.py
Hey there Farmer Suzy! Let's get started! How many eggs did you collect this week: -4
That is not a valid number of eggs!
Okay Farmer Suzy! Let's try again! How many eggs did you collect this week:: -6
That is not a valid number of eggs!
Okay Farmer Suzy! Let's try again! How many eggs did you collect this week:: 888
That is not a valid number of eggs!
Okay Farmer Suzy! Let's try again! How many eggs did you collect this week:: 999
So sorry but you have entered too many incorrect values. Let's call it a day!
>>>
```

Figure 2 All wrong inputs

```
Python 3.6.1 (v3.6.1:69c0db5, Mar 21 2017, 18:41:36) [MSC v.1900 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
 RESTART: \\cypfileserver\homedirs\AKahlon\Documents\ACC Classes\Spring 2018 Class Prep-20180213T200852Z-001\Spri
ng 2018 Class Prep\Labs Spring 2018 New Set\Mod 2\farmerSuzyS18.py
Hey there Farmer Suzy! Let's get started! How many eggs did you collect this week: -4
That is not a valid number of eggs!
Okay Farmer Suzy! Let's try again! How many eggs did you collect this week:: 888
That is not a valid number of eggs!
Okay Farmer Suzy! Let's try again! How many eggs did you collect this week:: 555
What route will you take today? Enter M for Mountain or R for River: r
How many pounds of tomatoes did you sell 14
How many pieces of sweet potatoes did you sell 35
How many gallons of milk did you sell 44

================================================================

For the week this is what your financials look like:
      Total eggs collected             555 Suzy keeps 24
      Total cartons made                44
      Suzy eats                         15  One dozen + 3 left over
Total Expenses:
      Zach's Salary                157.50
      Market Fee                     3.57
      Chicken Maintenance           11.75
      Cow Maintenance               72.00
      Garden Maintenance            20.00
      Gasoline Used                  6.16
      Total Expenditure            270.98
Total Revenue:
      Egg Sales                    264.00
      Veggie Sales                  92.75
      Milk Sales                   484.00
      Total Sales                  840.75
Profits:
      Weekly Profit                569.77
      Projected Annual Profit   29,628.21
>>>
```

Figure 3 Some wrong inputs

```
Python 3.6.1 (v3.6.1:69c0db5, Mar 21 2017, 18:41:36) [MSC v.1900 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
 RESTART: \\cypfileserver\homedirs\AKahlon\Documents\ACC Classes\Spring 2018 Class Prep-20180213T200852Z-001\Spri
ng 2018 Class Prep\Labs Spring 2018 New Set\Mod 2\farmerSuzyS18.py
Hey there Farmer Suzy! Let's get started! How many eggs did you collect this week: 453
What route will you take today? Enter M for Mountain or R for River: m
How many pounds of tomatoes did you sell 12
How many pieces of sweet potatoes did you sell 34
How many gallons of milk did you sell 43

================================================================

For the week this is what your financials look like:
      Total eggs collected             453 Suzy keeps 24
      Total cartons made                35
      Suzy eats                         21  One dozen + 9 left over
Total Expenses:
      Zach's Salary                157.50
      Market Fee                     2.94
      Chicken Maintenance           11.75
      Cow Maintenance               72.00
      Garden Maintenance            20.00
      Gasoline Used                 10.02
      Total Expenditure            274.22
Total Revenue:
      Egg Sales                    210.00
      Veggie Sales                  84.50
      Milk Sales                   473.00
      Total Sales                  767.50
Profits:
      Weekly Profit                493.28
      Projected Annual Profit   25,650.64
>>>
```

Figure 4 All correct inputs