CSCI 141
Spring 2019
A2: Variables, Boolean logic, Conditionals
Due Date: See Canvas

This assignment has 2 parts. For the first part please answer the questions on Canvas assigned for this homework, and for the second portion you will complete a single programming task.

Getting Started

Review the labs and lecture slides to review. Topics needed to complete this assignment will be covered before the deadline. As usual, seek help early if you get stuck: come talk to me or the TAs during office hours, or visit the CS mentors for help. Please keep track of approximately how much time you spend on both portions of this assignment. You will be asked to report your estimate on Canvas after you submit.

Reminder: You can discuss this homework with your peers. However, the answers to the questions and programming solution MUST be your own. You cannot copy another person's code, you cannot have another person tell you what code to type, etc. If any part of this is unclear, please come see me.

1   Questions: 16 points

Please answer the questions available on Canvas. The questions on Canvas have been configured so that there is no time limit, but you have only 2 attempts to submit your answers. The score that is recorded in Canvas is the score that is the latest (most recent submission) of your attempts.

2   Coding Task: 25 points

Suppose that you are a programmer for a game development company called *Fungi*. The text adventure game being prepared for launch involves a character meandering through the forest, during which they find and pick up mushrooms.

Your task is to write code for a portion of the game in which the role-playing character encounters a chef who wants to exchange some of the gathered mushrooms for rubies. The chef exchanges mushrooms for rubies according to her secret formula (explained below).

The chief game designer has given you the below pseudocode that explains the mechanics that your python program should implement. The chief software engineer has also instructed you to **use no more than 10 `if` keywords**.

- Prompt the player to specify how many shiitake mushrooms were found and picked up

- Prompt the player to specify how many portobello mushrooms were found and picked up

- Include a narrative of how the player is meandering through the forest

- The chef asks the player how many of the shiitake mushrooms they'd like to trade

- The chef asks the player how many of the portobello mushrooms they'd like to trade

  - If the player specifies that they want to trade more mushrooms (of either kind) than have been collected, the chef ends the conversation (the program ends; it should not throw an error).

  - If the player specifies to trade a total of zero mushrooms (i.e., the sum of both mushroom types), the chef ends the conversation (the program ends; it should not throw an error).

  - If the player wants to trade their mushrooms, then the chef will offer rubies according to the following exchange rules (the chef's secret formula):

Number Shiitake Player is Willing to Trade	Number Portobello Player is Willing to Trade	Rubies Offered by Chef
Fewer than 10	Fewer than 5	Twice the number of Shiitake offered for trade
Fewer than 10	5 or more	Three times the number of Portobello offered for trade
Multiple of 12 but NOT a multiple of 24	20 or more	Four times the number of Portobello offered for trade
Multiple of 12 but NOT a multiple of 24	Fewer than 20	The number of Portobello offered for trade
A number of Shiitake mushrooms different than any of the 4 above choices	Any	Five times the number of Shiitake offered for trade

- The chef should ask the player if they want to make the exchange. If the player enters `y`, `yes`, or `Yes`, the program should output the number of rubies that the player walks away with, as well as the number of portobello and shiitake mushrooms that the player retains. Otherwise, the program should output the number of portobello and shiitake mushrooms the player walks away with.

Two sample invocations of the program are shown in Figure 1:

```
>>> %Run fungiExchange.py
 How many shiitakes have you picked up? 20
 How many portabellos have you picked up? 0
 As you meander through the forest, you round a corner and a soup chef
 appears out of nowhere and hits you over the head with her wooden spoon. "Watch
 where you're going!" she says. She peers into your bag and her demeanor changes
 immediately. "I have rubies I can give you for those mushrooms..."
 How many shiitakes are you willing to trade? 0
 How many portabellos are you willing to trade? 0
 The soup chef twitches and says, "If you don't want to trade, then get out of my woods!"
>>>

>>> %Run fungiExchange.py
 How many shiitakes have you picked up? 45
 How many portabellos have you picked up? 12
 As you meander through the forest, you round a corner and a soup chef
 appears out of nowhere and hits you over the head with her wooden spoon. "Watch
 where you're going!" she says. She peers into your bag and her demeanor changes
 immediately. "I have rubies I can give you for those mushrooms..."
 How many shiitakes are you willing to trade? 32
 How many portabellos are you willing to trade? 7
 The chef offers you 160 rubies.
 Do you accept the trade? (y / n) y
 You make the exchange, and walk away with 160 rubies,
 13 shiitakes, and 5 portabellos.
>>>
```

Figure 1: Sample Outputs

If you proceed with computer science you'll learn about more formal testing techniques. For the time being, use the below table for sample inputs and outputs of the program to make sure that your code is working correctly. Note that these sample inputs are not an exhaustive test suite. Your code will be graded on a different set of tests from the ones given below, so you can't count on these tests finding all possible mistakes. You should test your program on your own combinations of inputs, making sure that you have tried out all possible paths that your code might take.

Shiitakes Found / Willing to Trade	Portobellos Found / Willing to Trade	Chef Offers	Accept?	Player's Final Shiitake/Portobello/Rubies
10/5	30/22	66 rubies	Yes	5/8/66
100/0	40/5	15 rubies	Yes	100/35/15
10/10	5/6	Chef runs away	NA	NA
10/10	6/5	50 rubies	No	10/6/0
20/0	0/0	Unwilling to trade	NA	NA
13/12	9/8	8 rubies	Yes	1/1/8

Submission

Submit a file called `fungiExchange.py` to Canvas containing your implementation of the program, and complete the questions on Canvas. Fill out the A2 Hours quiz on Canvas with an estimate of the number of hours you spent working on both parts of this assignment.

Rubric

Canvas questions	16 points
Top of python file has comments, including name, date, and description	1
The program correctly prompts for the mushroom input	2
The ruby and remaining mushroom counts are correct after making a trade	7
The remaining mushroom counts are correct when the trade is not made	2
The program responds correctly if the player specifies they want to trade 0	3
The program responds correctly if the player wants to trade more mushrooms than have been picked up	3
The program uses no more than 10 `if` keywords	5
The code is commented adequately and variable names are appropriately named	2
Total	41 points

3 Challenge Problem

The A2 challenge problem is worth 1 point of extra credit: Write a program that prompts the user for three integers, and prints the median and mean of the three integers. Do not use any built-in or external libraries (i.e., your program should not have any import statements). Upload your solution as `threestats.py`