Quiz 1 Question Bank

Computational Thinking Fall 2019

1. Using if/else to capture tax bracket calculation

The following represent rough, simplified approximations of the Iowa tax brackets. The way tax brackets work is that you are taxed at a rate on your first $x of income, a higher rate on your next $y dollars of income, etc.

**For example, if the person made $30,000 in income for 2019, they would be taxed $10,000\*.04 + $15,000\*.065 + $5,000\*.08 = $1775.**

Tax brackets:

|  |  |
| --- | --- |
| Taxed Income | Percentage |
| $0 - $10,000 | 4% |
| $10,001 - $25,000 | 6.5% |
| $25,001 - $50,000 | 8% |
| $50,001+ | 9% |

* Write three variables max\_tax1, max\_tax2, max\_tax3 that calculate the maximum for each bracket, so that if you are above that tax bracket you will be paying that amount plus an additional amount.
* Use input( ) to get a float or int variable income from the user.
* Use if/elif/else statements and the max\_tax variables to get the tax on the income.
* Print the calculated **after-tax income** at the end of the program.
* Example input: What is your 2019 income? **30000**

max\_tax2 = 10000\*.04 + 15000\*.065

**Input variable from user**

tax =(**income** – 25000)\*.08 + max\_tax2

tax = 1775

* + Example output: Your after-tax income is $ 28225

1. Write a program that asks the user to enter how much they would like to contribute to their Roth IRA (retirement) and for how many years. The program will then output their projected savings after that many years.

* Use the input() function to get input variables years, deposit from the user.
* Use a loop to calculate how much they'll save after years if the ROI (return on investment) is 7% (.07) every year.

Each year in the loop, ask the user how much they’ll deposit, add the deposit to the total, and then multiply the total by (1+ROI)

* Each year, put in an error check using an inner while loop that will print out an error statement and keep asking the user for input if the deposit is less than 0 or more than 6000 (federal limit)
* Print the total at the end of the program.

Hint - use 4 variables: ROI, deposit, years, total

At beginning of program, total = 0 ROI = .07

Example input:

For how many years are you depositing? 3

How much would you like to deposit? -10

Your deposit needs to be >=0 and <= 6000: 5000

How much would you like to deposit? 5000

How much would you like to deposit? 5000

Example output: Amount in Roth IRA: $ 17199

1. Donations Loop

A nonprofit is trying to raise $1,000 for a campaign to help fund programs for adult literacy.

* Write a while loop that allows a user to input donation amounts until they reach that goal.
* As an error check, put in an inner while loop that will go until the user enters a number >= 0. (Don't want them stealing from the nonprofit).
* Once the goal of $1,000 is reached, output:
  + the total number of donations
  + the average donation amount.

Hint: Use 3 variables - donation,donation\_total and counter

Sample Input: Please enter donation amount: -40

Please enter a value >= 0: 150

Please enter a donation amount: 900

Sample Output:

The number of donations: 2

The average donation amount: $525

1. String and logical operator

Write a Python program to add 'ing' to the end of a string given using the input() function (length should be at least 3). If the length of the given string is less than 3, put the user in a while loop that can only end when they enter a string that has 3 or more letters.

If the given string already ends with 'ing' then add 'ly' instead.

Sample Input : What is the string? abc

Expected Result : 'abcing’

Sample Input: What is the string? 'ab'

Please use 3 or more letters: 'string'

Expected Result : 'stringly'

1. String and Slicing

* Write a Python program to get a string made of the first 2 and the last 2 chars (characters) from a given a string. You can do this by creating a new string variable through slicing. Use the input() function to define the string variable.
* If the string length is less than 4, have the user enter a while loop that only exits when they enter a string that is 4 or more characters long.
* Then, use a loop to print out the new string backwards vertically (line by line)

Sample Input : What is the string? W3r

Please enter a string that is 4 or more letters: w3resource

Expected Output: w3ce

e

c

3

w

1. Write a Python program to check whether a character entered as input is a vowel or consonant. A vowel is any letter that is “a”, “e”, “i”, “o”, or “u”, and a consonant is all other letters. In addition, put in a statement that catches and prints out that “y” is either a consonant or a vowel.
   * Additionally, if the user enters either nothing or more than one letter as input, put them in a while loop that prompts them to enter one letter. This loop will only end when they enter exactly one letter as input.

\*\*You do not need to worry about a user entering a number or special character\*\*

Example input: Please give a letter: aa

Please enter only one letter: a

Example output: Your letter a is a vowel.

1. You are a presidential candidate trying to qualify for the next round of debates by getting 5 additional unique donors (let’s pretend you have 164,995 donors already).

Write a loop that uses the input() function to ask the user for the amount they would like to donate each time. This loop (for or while) should run 5 times. After the loop has run for 5 donors, output the total donation and average donation amount (from those 5 donations).

Additionally, you don’t want a user taking from your campaign fund, so write a while loop inside your original loop that keeps going until the user enters a number >0.

Hint: Use variable donation\_total to keep track of how much money has been donated so far in your loop. Set donation\_total=0 at the beginning of your program.

Sample Input: Please enter donation amount: -40

Please enter a value > 0: 150

Please enter a donation amount: 900

Please enter a donation amount: 200

Please enter a donation amount: 100

Please enter a donation amount: 50

Sample Output:

The total donation amount: $ 1400

The average donation amount: $ 280