ENGR 102 - Lab Assignment #7B

Fall 2020

You are to write the following program as described below. For all programs, include comments in your code that describe the purpose of individual blocks. Remember the appropriate header information.

Program 1: Li-Lists-sts

☑ *Use for and/or while looping structures in Python as appropriate*
☑ *Use lists-of-lists to store and manipulate data.*

Find the list in a list-of-lists whose sum of elements is the highest, and print the sum and list to the user.

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e.g., [[1, 2], [2, 5], [3, 2]]  → [2,5] with a sum of 7.
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Program 2: Solutions

Solve a function (*e.g.*, y(x) = sin(x) / (sin(x/10) + x/10) for many different values of x between a user-defined min and max, and store the values in a list. Also, print the maximum value of y(x) for the given range.

Program 3: Pig Latin

☑ *Use list operations and looping structures on strings*

"Pig Latin" is a way of converting words in standard English to similar words that sound different:

- If a word starts with a consonant, move the consonants to the end of the word, and add "ay" to the end.
  e.g. "computer" becomes "omputercay"
- If a word starts with a vowel, add "yay" on to the end of the word. Treat 'y' as a vowel for this assignment.
  e.g. "engineering" becomes "engineeringyay"

Write a program that repeatedly reads in a word from a user and converts it to Pig Latin. The program should continue reading words until the user enters "stop".

Challenge (optional, for glory only):

Try to write a program where, instead of just one word, the user enters an entire sentence, and all words in the sentence are converted to Pig Latin.

Program 4: GPA Calculation:

☑ *Use for and/or while looping structures and conditional statements in Python*

Write a program that asks a user how many classes they are taking this term, the name of each class, the credit hours for each class, and their final letter grade for each class, and then calculates their term GPA. Use either a list for each course, or a single list-of-lists. The grading system and examples can be found on the TAMU website: *http://registrar.tamu.edu/Transcripts-Grades/How-to-Calculate-GPA*

(continued, next page)

Program 5: Making the Cut in Golf

☑ *Create appropriate list of variables, and plan how to create a Python program.*
☑ *Create Python program to read user input, perform necessary data reformatting, and print the expected output.*

Professional golf tournaments typically last four rounds, and a player's score is the sum of their individual round scores (the lower the better). It is common for all players to play the first two rounds of golf. A "cut" score is determined, and those whose scores are better (*i.e. lower*) than the cut are allowed to play the remaining rounds of the tournament (they "made the cut") while the rest do not.

a. Write a program that reads in an arbitrary number of golfers' names, and their first and second round scores. Specifically, it should read the first round score on one line, then the second round score on another line, then the player's name on a third line. The user should indicate they are done entering players by giving a negative score for the first round (the reading of data should stop without attempting to read a second round or player name when this occurs).

b. The cut for our tournament will be the median score among the golfers.

   You are not to use the built-in command to find the median or sort the data.

   There are many ways to find a median. A major part of this problem is to figure out a method for finding the median, yourself. There are solutions involving multiple loops, there are solutions using multiple lists, and so on. Commonly the numbers are sorted from smallest to largest, and then the median is found or calculated directly.

c. Print out the names of golfers who made the cut and those who did not make the cut. You will be outputting two sets of names; be clear which is which.