Intro to Python – Lesson 27 and 28

Today we want to continue the examination of list with a few examples to show different ways you can include a list in your programs. The first two exercises use lists to return multiple values from a function, while exercise 3 does more with graphs, and finally, exercises 4 -5 use list to store and process data.

1. Write a function that accepts the total sales for a salesperson and returns their bonus. The bonus is based on 1% of sales. If sales are less than $5000.00, the bonus will be reduced by 17% of the amount under $5,000.00, but if the sales are greater than $100,000.00, then an extra $500.00 is added to the bonus value. Also construct a Status message that reads "Under" if they are under 5000, "Normal" if they are between 5000 and 100000, and "Extraordinary" if the sales are greater than 100000. Return the Bonus and the Status.

2. Your boss has asked you to take a break from your current program and write a function that is required to perform the following. After the function, write a statement that shows how the function could be used in a calculation. The function will ask the user for a product name and a product cost. The employee discount is based on the price of the item and is calculated at 30% for items under $1,000.00, and 40% for items at $1,000.00 or more. The HST is calculated on the price before the employee discount at 15%, and the environmental tax is calculated at 2% of the discounted price. The Total cost of the item is calculated as the price less the discount, plus all taxes. The returned values from the function will be the name and cost of the item along with the discount, environmental tax, and the total cost of the item.

3. Write a program with the following options in a menu:

   Mo's Graphing Program

   1. Graphing a Simple Line.
   2. Graphing a Parabolic Function.
   3. Graphing a Wave Function
   4. Graphing a Root Function.
   5. Quit the program.

      Enter choice (1-5):

   A simple line has the equation $y = mx + b$. Ask the user to input values for m and b, create a list for the x and y axis based on the formula, and graph the results. The parabolic function has the equation $y = ax^2 + bx + c$. Ask the user to input values for a, b, and c, create a list for the x and y axis based on the formula, and graph the results. You can continue with the wave function and the root function.

4. Write a program for a real estate agent to record information on home listings. Include the Listing number (9-digit number), street address, number of bedrooms, number of bathrooms, total square footage, the listing price and the date – note that a home can have multiple prices – so store the date and price for each. Finally enter the status – must be one of Open, Offer Pending, or Sold.

5. Billy Bob is a number and sorting enthusiast; he loves to play with numbers all day long. We are going to write a program to help Billy Bob in his number endeavors. We want to write a program that takes in a series of numbers, one after the other, until we input the number -1. Once we enter the number -1 into the program, the program will stop accepting inputs. At this point, the program should print all the numbers we have entered so far in the order that we entered them. It will then take all the number, sort them, and print the numbers to the screen in sorted order. Also determine and find the total of all the numbers, the average of all the numbers, the maximum value, the minimum value, and a list of duplicate values in the list. Display each with an appropriate heading. This will no doubt save Billy Bob many hours per day of manually sorting using pen and paper.

6. Write a program that grades quizzes as follows. Ask the user a title for the quiz and how many questions there are in the quiz. Ask the user to enter the key (that is, the correct answers). There should be one answer for each question in the quiz, and each answer should be a string (A, B, C or D). You will need to store the key in a list.

   Prompt the user and ask how many quizzes need to be graded. Ask the user to enter the students name and the answers for each question. Note that these answers do not need to be stored; each answer can simply be compared to the key as it is entered. Repeat for each student. Use a list to store the student's name, the number correct and the % Grade. When the user has entered all the quizzes, print the student's name, the number correct and the percent grade for each student.

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Quiz: XXXXXXXXXXXXXXXXXXXXXXXXXX

Student          # Correct        % Grade
-------------------------------------------------
Sally                16                80
Bobby                12                60
                      :
                      :
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See you at 1.