Python Programs

Problem 1:

- The **create_list** function should take the size of the list and prompt the user for that many values and store each value into the list. The **create_list** function should return this newly created list.
- The **main()** function should prompt the user for the number of values to be entered, pass that value to the create_list function to set up the list, and then call the get_total function to print the total of the list.

File name: total_function.py

Problem 2:

- As part of their CHEM 101 class, students must memorize the symbols of the first 20 elements in the periodic table by atomic number.
  - E.g., H, He, Li, Be, B, C, N, O, F, Ne, Na, Mg, Al, Si, P, S, Cl, Ar, K, Ca
  - **Hint:** This list is an ideal candidate to be stored as a constant.
- Students are quizzed in these 20 elements and answers are stored in a file.
- You must write a program to check a student's answer to a quiz requiring the student to list the first 20 entries in the periodic table in a file.
- You should have a function called **read_elements** that takes a file name as a parameter, reads in the content of a file containing a sequence of periodic symbols, and returns a list comprising all of the symbols.
- You should have a **compare** function that takes the list representing the student's response, compares the list against the correct list of symbols and return the number of elements that do NOT match in the two lists as well as a list of the numbers of elements that do not match.
  - **Hint:** Remember that functions can return two values.
- Your main function should prompt the user for the name of the student's file, call **read_elements** to read in the elements from the file, call the **compare** function to return the number of elements that do not match and print this number.
- The output should be labeled correctly and readable. (e.g., 0 elements do not match.)

File name: elements.py

Problem 3:

- The materials for this lab include a file titled **artists.txt** which contain a list of Billboard's top artist for each year from 1958 to 2016.

- You must write a program that allows the user to specify an artist's name and the program will print the number of times that artist shows up in the top artist list.
- You must write a function called **load_artists** to read the artists in from a file and into a list.
- You must write a function called **artist_count** that takes the name of an artist and the list of artists and returns an integer indicating the number of times the artist appeared in the top 100 list.
- Your main function should call **load_artists** to load the artists into a list. It should then prompt the user for the name of an artist and call **artist_count** to calculate the number of times the name appears in the list. The main program should print this number.

File name: artists.py

Problem 4:

- A set of exam grades for a class of students is stored in a 2-dimensional list where each element in the outer list is a set of exams for an individual student.
  - For example, the list: [[70, 80, 90], [30, 40, 50]] represents three exam grades for two students.
- Write a program that contains two functions to print out exam grade averages:
  - The **print_student_average** function should take a 2D list as an argument and calculate and print the exam average for each student in the class
  - The **print_exam_average** function should take a 2D list as an argument and calculate and print the average for each of the exams for all students in the class.
- Your main function should create a 2D list (you may hard code a list in your main) and call the two functions.
- Remember to use constants to indicate the number of students and number of exams.

File name: exams.py