Assignment – 3

CS 170 Total Points: 100

Note: Only typed submissions are accepted. **You are required to use only the coding techniques you have learned in the first 6 chapters.**

Each problem carries 20 points.

YOUR SOLUTIONS MUST BE YOUR ORIGINAL WORK. FAILURE TO DO SO WOULD RESULT IN SEVERE PENALTY.

10 points for problem 1.

1. Numerologists predit that a person's character traits could be determined based on the numeric value of a name. The value of a name is determined by summing up the values of the letters of the name where "a" is 97, "b" is 98 and so on with "z" as 122. Write a function that calculates the numeric value of a single name provided as input by the user.

   Submit py code and a test run screenshot.

15 points each from problem 2 through 7.

2. Update your "futval.py" program from chapter 2 such that the program prompts the user for the amount of the investment, the annualized interest rate, and the number of years of the investment. The program should then print a nicely formatted table that shows the value of the investment year by year, like below:

```
Year      Value
---------------
   0     $2000.00
   1     $2200.00
   2     $2420.00
   3     $2662.00
   4     $2928.20
   5     $3221.02
   6     $3542.12
   7     $3897.43
```

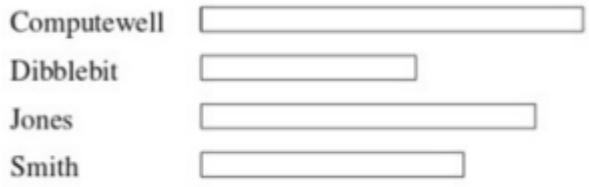
   Submit py code and a test run screenshot.

3. Counting words in a message or a text file is a very common application and most applications you use have this utility. Write your own version of 'word count' based on what you have learned in the class and textbook. In your program, you'd use GUI/file dialog from chapter 5 so that user can select a text file graphically. Your output would print three values as the number of lines, number of words and number of characters in the file.

   Submit py code and a test run screenshot

4. Develop a pseudo-code to plot a horizontal bar chart of student exam scores. The code should get input from a file, this file in the first line contains the count of the number of students in the file, and each subsequent line contains a student's last name followed by a score in the range of 0-100. Your code should draw a horizontal rectangle for each student where the length of the bar represents the student's score. The bars should all line-up on their left-hand edges.

   Now convert this pseudo code into actual py code. Your final output should look something like below:



   Submit pseudo-code, py code and a test run screenshot.

5. Submit py code for each of the definitions of the following functions:

   - *sphereArea(radius)* -> this function returns the surface area of a sphere having the given radius
   - *sphereVolume(radius)* -> this function returns the volume of a sphere having given the radius.

   Now write a main function that uses the two functions you have defined above, and solve the Programming Exercise 1 from Chapter 3.

   Submit py code and a test run screenshot.

6. You have learned about lists and how do they work. Define a function with the specification *squareEach(nums)*, where *nums* is a list of numbers passed by the user. The function must modify the list by squaring each value, and return the modified list. Using the main function, you should call *squareEach* function, and print the returned list.

Submit py code and a test run screenshot.

7. You have learned how to work with graphics library and draw basic shapes. Define a function with the specification *drawFace(center, size, win)*, *center* is a Point, *size* is an int, and *win* is a GraphWin. This function draws a simple face of the given size in win. You may choose to draw a simple smiley face or grim face or some other interesting face, as long as it is a face.

   Now call this function multiple times from main to draw several faces of varying sizes in a single window. You may extend the function's scope by rewriting the code and adding color as another argument, so that each face is drawn in a different color.

   Submit py code and a test run screenshot.