CIS-105 – Spring 2021   **Lab #3 – Chapter 4**   **Maria Burness**

Due by 11:59 pm on the date specified in Canvas; 50 points total.
  ➢ Late submissions are penalized 5 points per day late.

Instructions:

- Complete each of the following problems as a separate Python (.py) file.

- The name of each Python file should be of the form "Lab3_probX.py".
  o Example: Lab3_prob1.py for problem 1, Lab3_prob2.py for problem 2, etc.

- "Zip" all three problem files into ONE zip file and submit to Canvas by the due date.

- Follow variable naming rules as described on pages 43-44.

- Comment <u>frequently</u> in your code using the "# comment" convention described on pages 39-40. At a minimum, you should have a comment line at the beginning of the program with your name and what the program will do. <u>Comments are for the</u> <u>programmer to see.</u>

- Display 1-2 print statements to the user on the purpose of the program before asking for any information. <u>This is for the user to see.</u>

- Check the accuracy of the output you get out of your code. In other words, how do you know that the output is correct?

- The grading rubric is provided at the end of this document for your reference.

1. **Problem 1 – Perimeter of a n-sided Polygon; User Controlled Loop (15 points)**

o Write a program that prompts the user for the number of sides (n) of a polygon. From there, the program should ask for the length of each side (side lengths can be different) and calculate the perimeter of the polygon. Finally, display to the user a statement that says "The perimeter of your n-sided polygon is _____ units." where you substitute in the number of sides in for "n" and give the perimeter.

o Your code must utilize a "for" loop.

o Be sure to also follow the bulleted items in the instructions (comments, display purpose to the user programmer, display purpose statement to the user, etc).

o *Sample output:*

  This program will ask for the number of sides in a polygon, ask for the lengths of each side, and then calculate the perimeter.

  How many sides does the polygon have?   5

  Give the length of side 1: 3
  Give the length of side 2: 5
  Give the length of side 3: 2
  Give the length of side 4: 1
  Give the length of side 5: 4

  The perimeter of this 5-sided polygon is 15 units.

2. **Problem 2 – Bowling Average; Input Validation Loop (15 points)**
   o Write a program that prompts the user to give last night's 3 bowling scores and then display back to the user their average.

   o This program must validate that the bowling scores are valid (between 0 and 300 inclusive) or display back to the user that the entered value is not a legitimate bowling score and force the user to re-enter the score until it is a valid score.

   o Your code must utilize a "while" validation loop to check the bowling scores. Your code must utilize a "for" loop to ask for the bowling scores.

   o Be sure to also follow the bulleted items in the instructions (comments, display purpose to the user programmer, display purpose to the user, etc).

3. **Problem 3 – Mad Libs; Nested "for" Loops. (20 points)**
   o Write a program that generates silly phrases (similar to Mad Libs), using nested "for" loops.

   o Prompt the user for two verbs, three adjectives, and two nouns.

   o Create a "for" loop that will iterate through two verbs. Create a nested "for" loop that will iterate through three adjectives. Inside of this loop, nest another "for" loop that will iterate through two nouns. The loops will iterate through each combination of verb, adjective, and noun in that order.

   o Be sure to also follow the bulleted items in the instructions (comments, display purpose to the user programmer, display purpose statement to the user, etc).

   o *Sample output:*

   This program will display simple "Mad Lib" phrases with verbs, adjectives, and nouns to demonstrate nested loops.

   Swim slow bike
   Swim slow car
   Swim shiny bike
   Swim shiny car
   Swim yellow bike
   Swim yellow car
   Ride slow bike
   Ride slow car
   Ride shiny bike
   Ride shiny car
   Ride yellow bike
   Ride yellow car

Lab #3 Rubric

1. **Problem 1 – Perimeter of a n-sided Polygon; User controlled loop (15 points)**

    _____ (3) Comments in the code to the programmer. Statement displayed to the user on the purpose of the program.

    _____ (3) Prompt the user for the number of sides in their polygon.

    _____ (5) Use a "for" loop to prompt the user for the length of each side of their polygon. User will need an accumulator variable in the loop.

    _____ (4) Display to the user a statement that says, "The perimeter of your n-sided polygon is _____ units" where you substitute in the number of sides in for "n" and give the perimeter.

2. **Problem 2 – Bowling Average; Input Validation Loop (15 points)**

    _____ (3) Comments in the code to the programmer. Statement displayed to the user on the purpose of the program.

    _____ (5) Use a "`while`" loop to validate the bowling scores.

    _____ (4) Use a "for" loop to ask the user for three bowling scores.

    _____ (3) Calculate and display to the user their correct bowling average.

3. **Problem 3 – Mad Libs; Nested "for" Loops. (20 points)**

    _____ (3) Comments in the code to the programmer. Statement displayed to the user on the purpose of the program.

    _____ (3) Prompt the user for two verbs, three adjectives, and two nouns.

    _____ (4) A "for" loop with two verbs.

    _____ (4) A "for" loop with three adjectives.

    _____ (4) A "for" loop with two nouns.

    _____ (2) Print the silly phrases from the nested loop to demonstrate that it was set up correctly.