CS 1301 Homework 2

Due: Monday, September 12th, before 11:55 PM
Out of 100 Points

Deliverables:
Files to Submit: HW2.py
Please name your file exactly as outlined and include all functions within the single file. There should be no function calls in the file submitted unless commented out and the file should run without syntax errors. You will lose points if the file cannot be run without syntax errors.
The header should include your name, the collaboration statement, and your GTID at the top of the file in the comments. If you import anything, include the imports at the top of the file, after the header.

For Help:
As always, start this assignment early to avoid issues. Use Piazza or the Help Desk for questions in addition to recitation.

Part 1
Functions: **drawing & museumTours & bankInterest**
    1. Function:
          drawing
      Parameters:
          sides (int)
      Return Value
          None

Code a function that takes in the number of sides the shape has and draws it using a FOR LOOP and turtles. You may assume that the number will be less than 8 and greater than 3. Print out a meaningful statement about the object, such as how many sides it is.

The formula for the sum of the interior angles of a regular polygon (a polygon with the same length sides) is:
Sum = 180(n-2) where n is the number of sides

    2. Function:
          museumTours
      Parameters:
          None
      Return Value
          time (as a string)

The museum has hired you to make a function that calculates the time the museum will close for that day. The closing time for a museum is dependent upon the number of tours in a day and the average time per tour. Ask the user how many tours will take place that day and how long the average tour is (In minutes). Return a string representation of the time the tours end. Assume that tours start at 1:00PM and will not go later than 11:59 PM.

Acceptable return times:
 "3:55"
"8:00"
Not acceptable:
"03:55"
"8:"
There must always be two numbers to the right of the colon, and there should not be a leading 0 on the left side.

3. Function:
   bankInterest
   Parameters:
   initialBal, rate (floats, rate as number out of 100)
   Return Value
   balance (float, to 2 decimal points)

Calculate how much money you will make each year in your bank account with a starting **initialBal** and a yearly interest **rate** after 10 years. The **rate** parameter will be passed in as a value out of 100 that you should convert to a decimal. You must use a FOR LOOP or you will not receive points. This interest rate will be compounding, so compute the new balance on the old balance+interest amount at each new year.

Assumptions:
There will always be 10 years to grow in value
Each year has same interest rate
No additions to balance after start
Compound once annually

Examples:
initialBal: 100.00, **rate**: 10 → 259.37
initialBal: 533.41, **rate**: 5 → 868.87

Part 2
   Everyone loves math, but why compute volumes all day when you could just code it away?! You will make a series of **5 functions** that compute and compare the volume of two shapes to find the larger one: a cube, sphere, pyramid, and cone.

1. Function:
   sphere
   Parameters:
   radius (an int)
   Return Value
   volume (a float)
Compute and return the volume.

2. Function:

        cube

    Parameters:

        side (an int)

    Return Value

        volume (a float)

Compute and return the volume.

3. Function:

        cone

    Parameters:

        radius, height (ints)

    Return Value

        volume (a float)

Compute and return the volume.

4. Function:

        pyramid

    Parameters:

        length, width, height (ints)

    Return Value

        volume (a float)

Compute and return the volume.

5. Function:

        compareVolumes

    Parameters:

        none

    Return Value

        volume (a float, with two decimals)

This function should ask the user which two types of shapes they would like to compare. It should then ask the user for the shapes' necessary dimensions (width, length, height, etc) based on what shape they asked for. It should call two of the functions above to actually complete this task and failure to do so will result in loss of points. After computing the volumes, compare them to one another to find the greater volume. Return the larger value.

The return value should be represented with a float rounded to 2 decimal points. (Note: using round(5.0,2) gives 5.0. This is acceptable)

Acceptable: 5.0, 5.10, 5.55   Not Acceptable: 5, 5.1234

Rubric

drawing (**15 pts**)
- Function Header (2)
- Uses a for loop to draw correct shape (10)
- Prints a Statement about the shape (3)

museumTours (**15 Pts)**
- Function Header (2)
- Get correct input (5)
- Prints correct time (8)

bankInterest (**20 Pts**)
- Function Header (2)
- Returns Correct Value (5)
- Uses For Loop & Returns Correct Value (13)

compareVolumes (**30 Pts**)
- Function Header (2)
- Correctly uses Conditionals (5)
- Correctly calls functions (10)
- Compares two final volumes (5)
- Returns correct value (8)

sphere, cube, cone, pyramid **(5 Pts Each)**
- Returns Correct Value (5)