Lab Week 3 Grading Rubric and Instructions

This lab is assigned for Week 3 of COM S 127: Introduction to Programming.

This lab is due by the end of the lab period seven (7) days after the one it is assigned in. See the syllabus for details.

Lab Objective

The purpose of this lab is two-fold. Firstly, it is to give you, the student, a bit of enjoyable practice with the 'turtle' library in Python. Secondly, this lab will give you the opportunity to read library documentation and do a bit of research/ citation work for a variety of scripts. Having the ability to search for information in both official online documentation and elsewhere, and apply this information to your code, is crucial for programmers who want to be able to start 'answering their own questions' in regard to how to accomplish their tasks.

Instructions/ Deliverables

NOTE: These tasks can be completed in any order you like. See the **Grading Items** section below for the point distribution.

CITATION: Many of the exercises found here could possibly be seen as adaptations of exercises found in the online textbook "How to Think Like a Computer Scientist: Interactive Edition" By Jeffrey Elkner, Peter Wentworth, Allen B. Downey, Chris Meyers, and Dario Mitchell.

- Available: https://runestone.academy/ns/books/published/thinkcspy/index.html?mode=browsing
- Accessed: 1-28-2023
- The abbreviation 'thinkcspy' and the chapter/ section number will be used to indicate where similar exercises can be found. This citation will be placed next to the exercise title.
    - ex: [thinkcspy 2.13] indicates a similar exercise can be found in chapter 2, section 13.

Reading:

- Read Runestone chapters 4 and 5, and show the TA the notes you took in your Engineering Notebook for each chapter once you are done.
    - NOTE: You do not need to complete any of the exercises at the end of the chapters. However, it would be helpful to you in the long term if you were to do so.

`initials.py`:

- Explore the following documentation:
    - https://docs.python.org/3/library/turtle.html#turtle.color
- Use any of the turtle commands you like from the documentation above to draw a picture of the initials from your first and last name.
    - This will require drawing exactly two letters - the first letter of your first name, and the first letter of your last name.
    - Your initials should be 'filled in' with colors of your choosing.
    - The background of the drawing should be a different color than your letters.
- Save your code, including your name, code creation date, lab number, and brief description, to a file called `initials.py`.

`cubeVolume.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as the length of the side of a cube, and write code that computes the volume of the cube. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `cubeVolume.py`.

`cubeSurface.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as the length of the side of a cube, and write code that computes the surface area of the cube. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `cubeSurface.py`.

`sphereVolume.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as the radius of a sphere, and write code that computes the volume of the sphere. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `sphereVolume.py`.

`sphereSurface.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as the radius of a sphere, and write code that computes the surface area of the sphere. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `sphereSurface.py`.

`fahrenheitToKelvin.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Fahrenheit, and write code that computes equivalent temperature to Kelvin. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what

your code does, to a file called `fahrenheitToKelvin.py`.

`kelvinToFahrenheit.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Kelvin, and write code that computes equivalent temperature to degrees Fahrenheit. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `kelvinToFahrenheit.py`.

`fahrenheitToCelsius.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Fahrenheit, and write code that computes equivalent temperature to degrees Celsius. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `fahrenheitToCelsius.py`.

`celsiusToFahrenheit.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Celsius, and write code that computes equivalent temperature to degrees Fahrenheit. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `celsiusToFahrenheit.py`.

`celsiusToKelvin.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Celsius, and write code that computes equivalent temperature to degrees Kelvin. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `celsiusToKelvin.py`.

`kelvinToCelsius.py` [thinkcspy 2.13]

- Prompt the user to enter a single numerical value.
- Use the value entered above as a measurement in degrees Kelvin, and write code that computes equivalent temperature to degrees Celsius. Then, output this information to the user.
  - HINT: You will need to perform an internet search and cite the definition of this formula in a comment. Be sure to include the URL, author (if available), date the article was written, and the

date you accessed the webpage.
- Save your code, including your name, code creation date, lab number, and brief description of what your code does, to a file called `kelvinToCelsius.py`.

Files Provided

None

Example Script

```
# Matthew Holman            1-28-2023
# Lab Week 3 - This example code calculates the sum of two numbers the user inputs.

a = int(input("Enter value 'a': "))
b = int(input("Enter value 'b': "))
c = a + b
print("The result of {0} + {1} = {2}".format(a, b, c))
```

Example Output

```
Enter value 'a': 2
Enter value 'b': 3
The result of 2 + 3 = 5
```

Grading Items

- (**Attendance**) Did the student attend the lab meeting, or make arrangements to attend virtually via WebEx?: _____ / 1
- (**Reading**) Has the student read chapters 4 and 5 of the Runestone textbook and shown their notes in their Engineering Notebook to the TA?: _____ / 1
- (**initials.py**) Has the student completed the task above, and saved their work to a file called `initials.py`?: _____ / 3
- (**cubeVolume.py** and **cubeSurface.py**) Has the student completed the task above, and saved their work to files called `cubeVolume.py` and `cubeSurface.py`?: _____ / 1
- (**sphereVolume.py** and **sphereSurface.py**) Has the student completed the task above, and saved their work to files called `sphereVolume.py` and `sphereSurface.py`?: _____ / 1
- (**fahrenheitToKelvin.py** and **kelvinToFahrenheit.py**) Has the student completed the task above, and saved their work to a file called `fahrenheitToKelvin.py` and `kelvinToFahrenheit.py`?: _____ / 1
- (**fahrenheitToCelsius.py** and **celsiusToFahrenheit.py**) Has the student completed the task above, and saved their work to files called `fahrenheitToCelsius.py` and `celsiusToFahrenheit.py`?: _____ / 1
- (**celsiusToKelvin.py** and **kelvinToCelsius.py**) Has the student completed the task above, and saved their work to files called `celsiusToKelvin.py` and `kelvinToCelsius.py`?: _____ / 1

TOTAL _____ / 10