Assignment 4: Functions II

40 Points scaled to 20 Points

Introduction

In this assignment, you will create functions to perform defined tasks then test your results on example data. No data files are required to complete this assignment.

Objectives

- *Create functions*
- *Define function parameters*
- *Use control flow and/or loops within functions*

Deliverables

- *Jupyter Notebook (Python) or R Markdown file (R) with all code embedded. Files can be rendered to HTML webpages if your instructor requires this. Include the task text using Markdown.*

Tasks

Task 1: Create a function that will calculate the amount of a tip if provided the cost of the meal and the tip percentage. (5 Points)

Task 2: Create a function that will calculate the area of a cylinder if provided the cylinder's radius and height. (5 Points)

Task 3: Create a function to convert between any of the following units for measuring pressure: Pascals (Pa), pounds per square inch (PSI), atmospheres (atm), and Torr. This will require using control flow. The function should accept arguments for Value, Input Units, and Output Units parameters. Test your function on an example pressure measurement. (10 Points)

Task 4: Create a function that will calculate the dominant wavelength of radiation released by a body based on the body's temperature using Wien's Law. The user should be able to define the units of the output as either centimeters, micrometers, or nanometers. This will require using flow control. (10 Points)

Task 5: Create a function that will calculate the wavelength of electromagnetic radiation if provided the frequency or the frequency if provided the wavelength. The user must provide the frequency in Hz and can provide the wavelength in centimeters, micrometers, or nanometers. The function will need to include control flow and have parameters to specify the mode

(Frequency → Wavelength or Wavelength → Frequency) and the units of measurement for wavelength. (10 Points)