CSE 2050 – Programming in a Second Language

Fall 2023

Homework 1: Numbers, Text Processing, Lists and 1-D Loops

Total Points: 30

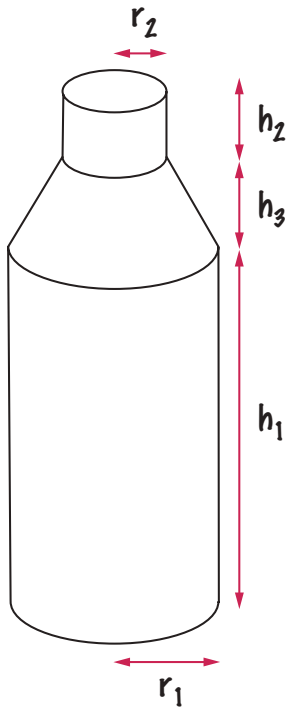
Date Assigned: Friday, Sept 8, 2023 **Due Date:** Sunday, Sept 17, 2023

Submission Instructions: Please submit your work on Canvas as a Jupyter Notebook `ipynb` file named `cse2050_yourname_hw1.ipynb`

Key Concepts Demonstrated

- Using Python's data collection objects (strings, numbers, 1-D lists) and simple loops
  - Evaluating numeric expressions (Q1)
  - Converting strings to numbers (Q1)
  - Extracting substrings from strings (Q2)
  - Partitioning lists into sublists (Q3)
  - Formatting/Reporting Data
    - Tabulating data (Q2)

1. (10 points) The shape of a bottle is approximated by two cylinders of radius $r1$ and $r2$ and heights $h1$ and $h2$, joined by a cone section of height $h3$.



Using the following two formulas together for the volume of a cylinder, $V = \pi r^2 h$, and the cone portion of the bottle,

$$V = \pi \frac{(r_1^2 + r_1 r_2 + r_2^2)\, h}{3},$$

write python code that prompts the user for inputs $r1$, $r2$, $h1$, $h2$, $h3$, and computes the total volume of the bottle. Print out the total volume of the bottle rounded to 2 DP using the f-string format specifier.

2. (10 points) Given the following two lists where `names` represent a list of hypothetical students at Florida Tech and `years` represent their year of admittance to the university, write Python code to generate their email addresses. An email address ends with the suffix `"@my.fit.edu"`. It is generated as `first initial + last name + admittance year + suffix`. Use a single loop along with *f-string* format specifiers to generate and tabulate the output as shown below. Notice that the email addresses consist of lowercase letters.

```
names = ["Willena Shupe", "Jolanda Agin", "Leta Stacker",
"Leonora Oliverio", "Birgit Stoudt", "Aron Valtierra", "Vi Buschman",
"Janee Barnwell", "Agnus Flower", "Byron Mccartney",
"Victoria Crabill", "Amy Swinton", "Arla Mohamed", "Bryon Vester",
"Lue Benway", "Mozelle Macauley", "Suzann Galindo",
"Delicia Barriere", "Marcella Uyehara", "Jane Curley"
]

years = [2020, 2019, 2016, 2019, 2013, 2014, 2014, 2018, 2016, 2012,
2014, 2015, 2018, 2013, 2019, 2017, 2019, 2020, 2015, 2013]
```

Expected Output

```
Student Name            Email Address
Willena Shupe           wshupe2020@my.fit.edu
Jolanda Agin            jagin2019@my.fit.edu
Leta Stacker            lstacker2016@my.fit.edu
Leonora Oliverio        loliverio2019@my.fit.edu
Birgit Stoudt           bstoudt2013@my.fit.edu
Aron Valtierra          avaltierra2014@my.fit.edu
Vi Buschman             vbuschman2014@my.fit.edu
Janee Barnwell          jbarnwell2018@my.fit.edu
Agnus Flower            aflower2016@my.fit.edu
Byron Mccartney         bmccartney2012@my.fit.edu
Victoria Crabill        vcrabill2014@my.fit.edu
Amy Swinton             aswinton2015@my.fit.edu
Arla Mohamed            amohamed2018@my.fit.edu
Bryon Vester            bvester2013@my.fit.edu
Lue Benway              lbenway2019@my.fit.edu
Mozelle Macauley        mmacauley2017@my.fit.edu
Suzann Galindo          sgalindo2019@my.fit.edu
Delicia Barriere        dbarriere2020@my.fit.edu
Marcella Uyehara        muyehara2015@my.fit.edu
Jane Curley             jcurley2013@my.fit.edu
```

3. (10 points) Given *any* list whose length is divisible by 4 and whose values are numeric, write Python code that uses a single loop to divide the list into four quarters and prints out the values for each quarter. For example, given the following list of 24 values:

   ```
   temperatures2 = [72, 32, 24, 61, 30, 42, 51, 21, 56, 32, 39, 70, 75, 54, 62, 49, 28, 54, 39, 24,
   31, 64, 72, 27]
   ```

   Your program should automatically find the number of values per quarter and print them out.

   Expected output:

   ```
   Quarter 1  [72, 32, 24, 61, 30, 42]
   Quarter 2  [51, 21, 56, 32, 39, 70]
   Quarter 3  [75, 54, 62, 49, 28, 54]
   Quarter 4  [39, 24, 31, 64, 72, 27]
   ```

   Also, test your program with the following lists and print out the output

   ```
   list2 = [72, 74, 85, 79, 64, 79, 90, 82, 81, 76, 92, 85]

   list3 = [76, 66, 76, 75, 76, 73, 92, 74, 70, 92, 62, 67, 64,
    60, 95, 85, 63, 91, 86, 67, 86, 81, 59, 71, 65, 79, 73,
    86, 91, 70, 86, 57, 94, 66, 95, 57, 87, 82, 95, 96, 78, 94,
    78, 65, 62, 76, 59, 92]
   ```