CSIT 104 – Computational Concepts

Python HW 2 (90 pts)

You are asked to create four individual programs in python, to name them and submit them through Canvas.

Each program must

- have exactly the name indicated below
- must include as comments inside your name, the name of the program, and a short description of what it does

All four programs should be compressed in an archive titled Project2LastName. Use zip to compress. All programs must be sent in ONE submission.

*Problem 1 (40 pts).*Create a game(named guesword.py) where the computer picks a random word and the player has to guess that word. The computer tells the player how many letters are in the word. Then the player gets five chances to ask if a letter is in the word. The computer then responds only yes or no. Then, the computer must guess the word.

You can assume that the words are from a predefined list. Have at least 20 words in the list.

Problem 2. (20 pts) Create a program (countdice.py) in which the computer simulates the rolling of a die 50 times and then prints:

- *the most frequent side of the die*
- *the average die value of all rolls*

Problem 3. (15 ps) Write a program (countskip.py) that counts for the user. Let the user enter the starting number, the ending number, and the amount by which to count.

Problem 4. (15 pts) You will write a program *computeCones()* that prompts the user for the radius and height of a 3-dimensional cone and then calculates and prints the surface area and volume of the cone. The calculation of the surface area and the volume will be done in functions, as will the gathering of the inputs.

Your program for this part will function as follows:

1. Print out a message indicating what the program does.
2. Prompt the user for the radius (a non-negative float) in feet.
3. Prompt the user for the height (a non-negative float) in feet.
4. Print the radius and height, but rounded to 2 decimal digits.
5. Print the surface area and volume, rounded to 2 decimal digits.

This version of the program will not check that the input is correct; if the user types anything other than a non-negative float, it can crash.

Your program must define and invoke two functions:

1. cone_surface_area(r,h): returns the surface area of a cone of radius r and height h

2. cone_volume(r,h) : returns the volume of a cone of radius r and height h.

The formulas for finding these values are as follows:

- Surface area of a Cone $= \pi r^2 + \pi r\sqrt{r^2 + h^2}$
- Volume of a Cone $= \pi r^2 h/3$

Import the math module and use math.pi and math.sqrt() in these calculations.