OBJECT ORIENTED PROGRAMMING WITH APPLICATIONS TO NUMERICAL METHODS AND LINEAR ALGEBRA, ES 4075 - 01
SPRING 2026, ASSIGNMENT – 1, # OF PROBLEMS: 4, TOTAL POINTS: 25
SUBMISSION DATE: 02/06/2026 BY 4:00 PM

Note:

- **Appropriate data types should be defined based on the problem statement.**
- **Submit a single zipped file containing only the source code files of Problems 1, 2, 3, and the Word file containing the solutions of Problem 4.**

Prob. 1 **POINTS: 6**

Design and implement a program that prompts the user for the lengths of the sides a, b, and c of a triangle and performs the following operations:

1. Determine the type of the triangle (acute, obtuse, right-angled, or equilateral) (Hint: Compute the angles)
2. Determines the area of a triangle. The area of a triangle can be computed from its sides using the formula below:

$$\boldsymbol{Area = \sqrt{s(s-a)(s-b)(s-c)}}$$

Where,

s is half of the sum of the sides of a triangle

Prob. 2 **POINTS: 4**

Write a program that computes the area and volume of a cylinder by prompting the user to enter the radius and height.

Prob. 3 **POINTS: 5**

Write a program to compute the wind-chill temperature using the formulae provided below. The program should prompt the user to enter an outside temperature between -58.0°F and 41.0°F and a wind speed of at least 2.0 miles per hour.

$$\boldsymbol{t_{wc} = 35.74 + 0.6215t_a - 35.75v^{0.16} + 0.4272t_a v^{0.16}}$$

Where,

t_a is the outside temperature in degrees Fahrenheit

v is the wind speed in miles per hour.

Note:

- The program should inform the user if the entered outside temperature is out of range and will not compute the wind-chill temperature.
- The program should inform the user if the entered wind speed is less than the minimum value and will not compute the wind-chill temperature.