TCES 455, Autumn 2022

Laboratory 1: Intro to MATLAB

Prior to lab:

- Install MATLAB/Simulink (version R2019b is recommended). Instructions for installation can be found on Canvas.
- Read about MATLAB basics on programming scripts & functions at: https://www.mathworks.com/help/releases/R2019b/matlab/scripts.html

  In particular, the following five sections
  a. Create scripts
  b. Loop control statements
  c. Conditional statements
  d. Add comments to programs
  e. Scripts vs functions

Lab 1 Assignment: Develop MATLAB scripts and functions

Q1. Create a ***script*** that adds all the terms in the series

$$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}\ldots$$

until the sum exceeds 1.995. When you run the script, it will print out the sum and the number of terms needed to just exceed the sum of 1.995.

Q2. Write a ***function*** that can be used to calculate the equivalent resistance of n parallel connected resistors. In general, the equivalent resistance of resistors $R_1, R_2, R_3, \cdots, R_n$ is given by

$$\frac{1}{R_{eq}}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}+\cdots\cdots+\frac{1}{R_n}$$

Q3. For a triangle with sides of length $a, b,$ and c, the area A is given as

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

where

$$s=\frac{a+b+c}{2}$$

Write a ***function*** to compute the area given the sides of a triangle. Also use the function to compute the area of triangles with the lengths: (a) 56, 27 and 43; (b) 5, 12 and 13.

Your individual (YES, individual even if you work with a partner) one-page lab summary should be submitted on Canvas by the specified due date. In the summary, please focus on your learning experience, and in particular, explain the difference between MATLAB scripts and functions. You can put MATLAB codes of Q1-3 in the attachment, but I am not going to grade them.