EE 233 Experiment 1

- Digital controller implementation.

  - similar to digital filters.
  - control $G(z) \Rightarrow$ difference equation.
  - boils down to implementing a sequential solution to a difference equation.

- Create a C program that will implement the sequential solution to the difference equation.

  - write a simple C program to implement the solution using double-precision floating-point representations and operations.

- Write the program in C (ANSI C). Put in appropriate comments.

- Implement the following difference equation.

$$y(k) = 0.9891e(k) - 1.8403e(k-1) + 0.9891e(k-2) + 1.8403y(k-1) - 0.9783y(k-2)$$

for a sampling rate of 1 kHz, this should implement at bandstop filter for frequencies between 55 Hz and 65 Hz.

- Run the program with zero initial conditions and using the following inputs.

  - unit step.
  - $\sin(\omega t)$ with $f\ =\ 100Hz$

- Store / plot the input and output samples.