Project 1 Assignment

Implement an Arduino-based embedded system that implements the following functionality:

Sample An Input Signal

- Assume a maximum sample frequency of Fs
- Design the external signal conditioning hardware to ensure the sampled signal is not aliased
- Capture 250 samples of the input signal in a circular buffer and display the result

Respond to Hardware Interrupt

- Accepts an external hardware interrupt request for an 8-bit data word.
- The ISR should shift an 8-bit word into a shift register.
- The shift register output should only be enabled when all 8 bits of the output data are available.
- Base your design on the MC74HC595A shift register

Implement I2C Based Communication (Grad and Honors Only)

- Implement I2C-based communication between multiple devices
- Prove reception of communication based on hardware address

Reports are to be typed.

Document all hand calculations supporting your design choices.

All code is to be uploaded with your project.