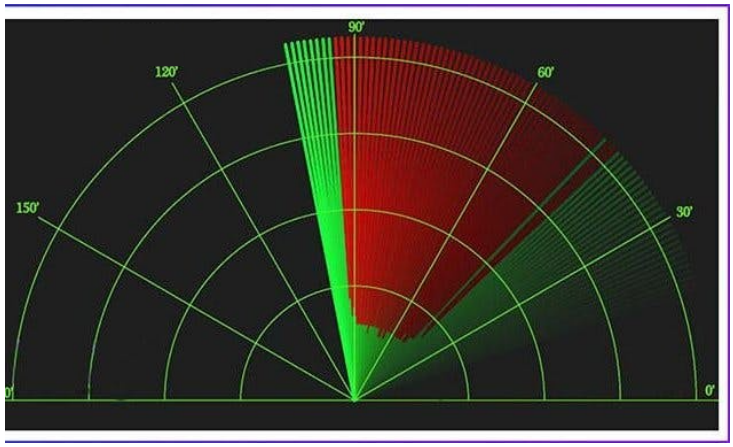
Midterm 1: US + Servo Motor Due Date: See Website

Q: Write, simulate, and demonstrate using Microchip Studio 7 a C code for the AVR ATMEGA328pb microcontroller that performs the following functions:

1. Mount the HC-SR04 Ultrasonic sensor on to the servo motor using the mounting plate/horn. Scan the servo motor from 0 – 180 deg. Collect the US distance/raw value continuously during the scan. The resolution of scan has to be less that 2.5 deg.
2. Display your results as a two dimensional, 0 -180 deg distance graph. Update your scan after every scan range.



Submission:
The following are required for successful completion of the design assignment:

a. AVR C code that has been compiled and working submitted to the github repository.
b. A word/pdf document that contains the C/assembly code well documented along with the kiCAD schematics with components used connected to the ATmega328P/PB.
c. In the word/pdf provide the screenshots of 1) successful compilation, 2) snapshot of the demo circuit, 3) screenshot of demo outputs, and 4) video links for each task.
d. Provide a text file in your github with links to youtube for all tasks.

Evaluation Rubrics:
See class website for the DA evaluation rubrics.