Drexel University

Memo #6

To: ECE 303

From: David Schmidt

CC: Other recipients

Arduino Mega 2650 Lab 4 Serial Motor and ultra-sonic sensor

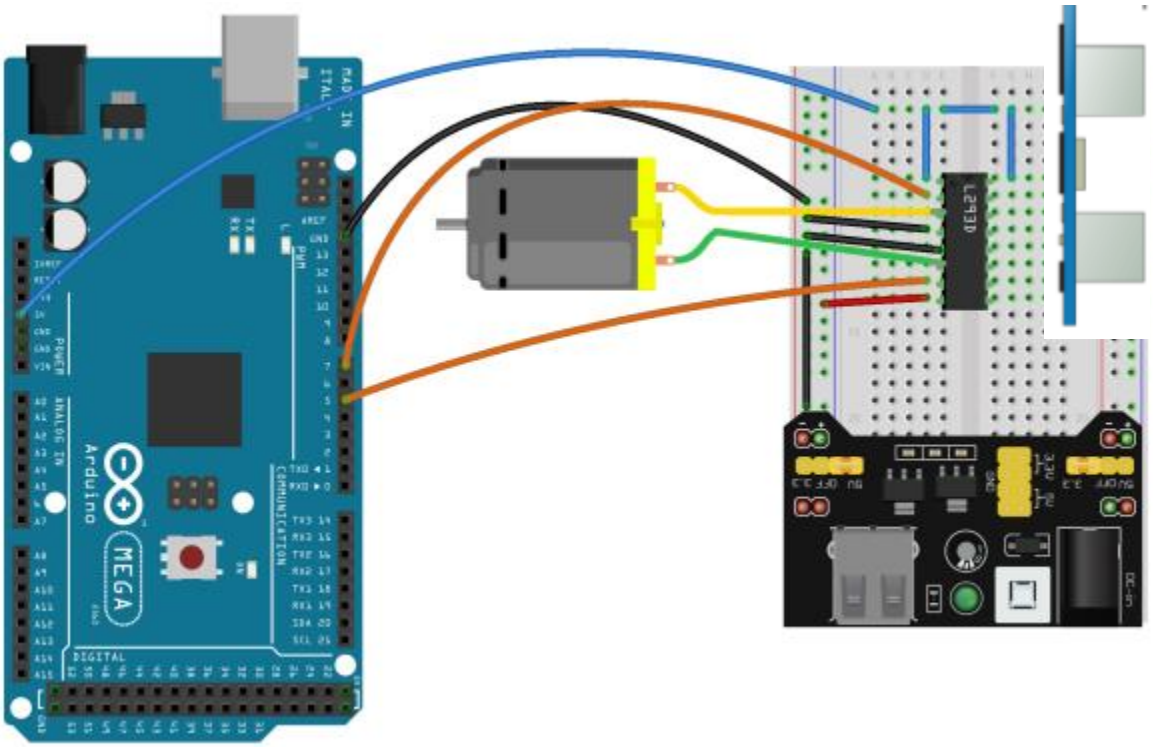
Task: Create a mapping for an ultra-sonic sensor on Y and X axis and graph it. Then program ultra-sonic sensor to signal an LED (stop light) and fan motor when to stop the motor and turn off the lights as objects get closer to sonic sensor.

Equipment: Mega Arduino 2650 starter kit

3-10k ohm resistor
Jumper wires
3 5v LED
Bread Board
Power unit
H-bridge

CODE: Code is on the following pages and the Arduino sketch will be attached with the submission

Saitama Japan **10/20/2021**


Arduino
MEGA
DIGITAL
ANALOG IN
POWER
L293D

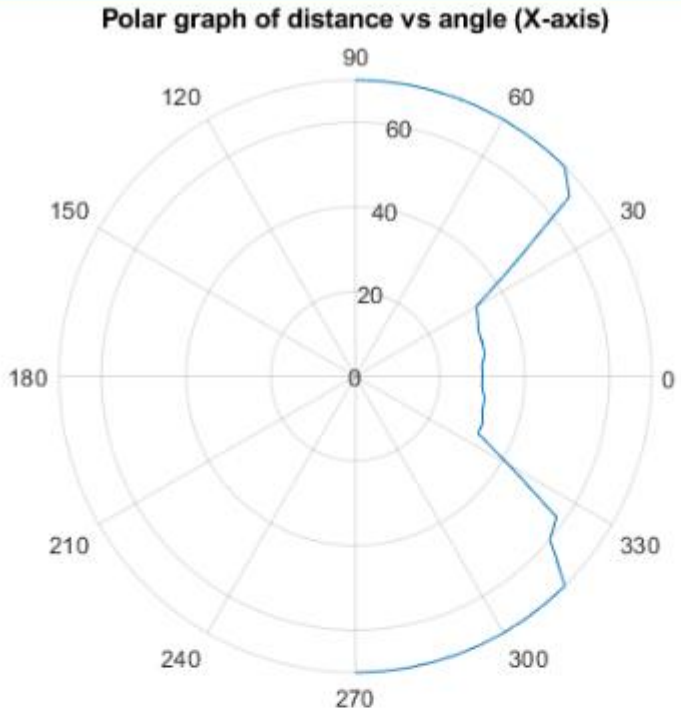
Arduino Code!

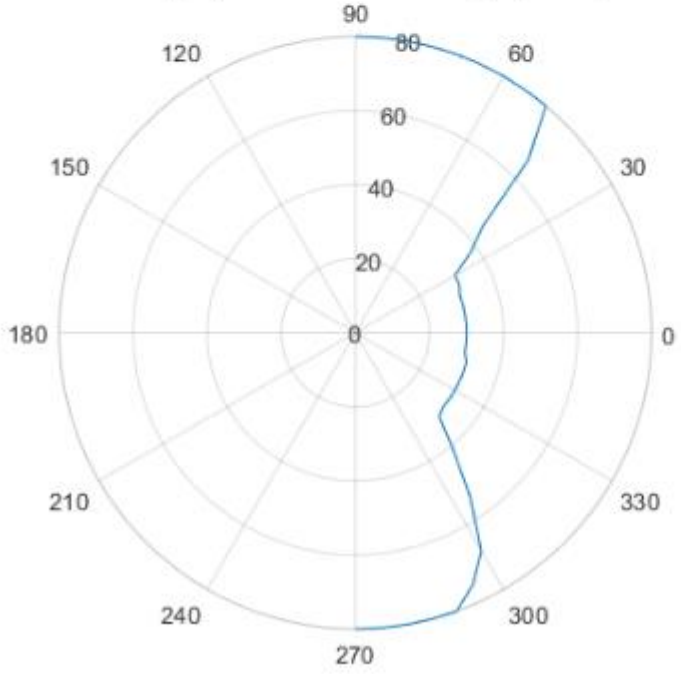
```
#define echoPin 42 // attach pin D2 Arduino to pin Echo of HC-SR04
#define trigPin 44 //attach pin D3 Arduino to pin Trig of HC-SR04

// defines variables
long duration; // variable for the duration of sound wave travel
int distance; // variable for the distance measurement
const int forward=5;
const int backward = 7;
int val = 0;
int out=0;
char temp;
String instr = "distance ";
String outstr=", Output speed: ";
String rotation ="";

int led1 = 24;
int led2 = 26;
int led3 = 28;
void setup() {
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an OUTPUT
  pinMode(echoPin, INPUT); // Sets the echoPin as an INPUT
  Serial.begin(9600); // // Serial Communication is starting with 9600 of
baudrate speed
  pinMode(forward,OUTPUT);

  pinMode(led1,OUTPUT);
```

```
  pinMode(led2,OUTPUT);
  pinMode(led3,OUTPUT);

  pinMode(backward,OUTPUT);
  Serial.begin(9600);;
}
void loop() {
  // Clears the trigPin condition
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);



  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);

  distance = duration * 0.034 / 2; // Speed of sound wave divided by 2 (go and
back)



    val=Serial.parseInt();
    temp = Serial.read();
    out=map(distance,0,110,-255,255);
    if(distance>30){

      analogWrite(forward,out);
```

```
  digitalWrite(led1, LOW);
  digitalWrite(led2, LOW);
  digitalWrite(led3, LOW);

}
else if(distance>20){

  analogWrite(forward,out);
  digitalWrite(led1, LOW);
  digitalWrite(led2, LOW);
  digitalWrite(led3, HIGH);

}
else if(distance>10){

  analogWrite(forward,out);
  digitalWrite(led1, LOW);
  digitalWrite(led2, HIGH);
  digitalWrite(led3, HIGH);
}
else{

  analogWrite(forward,0);
  digitalWrite(led1, HIGH);
  digitalWrite(led2, HIGH);
  digitalWrite(led3, HIGH);
}
```

```
  Serial.println(instr+distance+outstr+distance+rotation);

}
```


Polar graph of distance vs angle (X-axis)
90
120
60
60
150
40
30
20
180
0
0
210
330
240
300
270


Polar graph of distance vs angle (Y-axis)
90
80
120
60
60
150
40
30
20
180
0
0
210
330
240
300
270