//Basic two motor control program for an x-y joystick, where

//x is turn left or right, and y is forward and reverse (throttle)

//Joystick x-y potentiometers are wired as a 0-5 volt dividers with the

// wiper arms going to Arduino input pins.

//Written for Arduino Uno in C

//ESC's are Blue Robotics programmed for 1100 - 1900 usec input

//Author: Richard Fast 02/5/2016

#include <Servo.h>

//motor objects

Servo leftMotor;

Servo rightMotor;

//Outputs to left and right motor ESC's

int leftESCPin = 12;

int rightESCPin = 13; //LED pin

//input pins from joystick x-y voltage divider wiper arm

int xJoyPin = 4;

int yJoyPin = 5;

//value read from x-y joystick voltage divider wiper aarm

int yJoyVal;

int xJoyVal;

//Combination of x and y joystick voltage values

//going to right motor and left motor ESC's

int xyValRight;

int xyValLeft;

void setup(){

 //Attach motors to an ESC signal

 leftMotor.attach(leftESCPin);

 rightMotor.attach(rightESCPin);

 //Set ESC pins as output

 pinMode(leftESCPin, OUTPUT);

 pinMode(rightESCPin, OUTPUT);

 //Initialize ESC's

 for(int i=0; i<=3; i++)

 {

 leftMotor.writeMicroseconds(1500);

 rightMotor.writeMicroseconds(1500);

 delay(1000);

 }

}

void loop(){

 Serial.begin(9600); //For monitor debug

 //Analog read in joystick voltage values (0-5volts converted to 0-1023)

 analogRead(xJoyVal);

 delay(10);

 analogRead(yJoyVal);

 delay(10);

 //Map Arduino analog read to desired output to ESC's

 map(xJoyVal, 0,1023,1100,1900);

 map(yJoyVal, 0,1023,1100,1900);

 //Interpret x-y joystick movements and send signals to ESC's

 if (xJoyVal > 1500) //turn left

 {

 xJoyVal = xJoyVal - 1500;

 xyValRight = yJoyVal + xJoyVal;

 xyValLeft = yJoyVal - xJoyVal;

 rightMotor.writeMicroseconds(xyValRight);

 leftMotor.writeMicroseconds(xyValLeft);

 }

 else if (xJoyVal < 1500) //turn right

 {

 xJoyVal = 1500 - xJoyVal;

 xyValRight = yJoyVal - xJoyVal;

 xyValLeft = yJoyVal + xJoyVal;

 rightMotor.writeMicroseconds(xyValRight);

 leftMotor.writeMicroseconds(xyValLeft);

 }

 else //no turn, y throttle only

 {

 rightMotor.writeMicroseconds(yJoyVal);

 leftMotor.writeMicroseconds(yJoyVal);

 }

 //debbug

 Serial.print("Combined value to right ESC: ");

 Serial.println(xyValRight);

 Serial.print("Combined value to left ESC: ");

 Serial.println(xyValLeft);

 delay(1);

}