int lastOrientation = - 1; // previous orientation (for comparison)

const int ThumbPin = A0;

const int PointerPin = A1;

const int MiddlePin = A2;

const int RingPin = A3;

const int PinkyPin = A4;

const int ElbowPin = A5;

int x = 0;

int ThumbVal = 0;

int PointerVal = 0;

int MiddleVal = 0;

int RingVal = 0;

int PinkyVal = 0;

int ElbowVal = 0;

const int thumbUpper = 650;

const int thumbLower = 520;

const int pointerUpper = 850;

const int pointerLower = 530;

const int middleUpper = 570;

const int middleLower = 430;

const int ringUpper = 830;

const int ringLower = 510;

const int pinkyUpper = 960;

const int pinkyLower = 920;

boolean Connected = false;

int ACA[5][5] = {};

int avg[5] = {ThumbVal, PointerVal, MiddleVal, RingVal, PinkyVal};

String output = "";

void setup() {

Serial.begin(9600); // initialize Serial communication

Serial1.begin(9600);

// initialize device

Serial.println("Initializing IMU device...");

}

void loop() {

int orientation = - 1; // the board's orientation

String orientationString; // string for printing description of orientation

ThumbVal = analogRead(ThumbPin);

PointerVal = analogRead(PointerPin);

MiddleVal = analogRead(MiddlePin);

RingVal = analogRead(RingPin);

PinkyVal = analogRead(PinkyPin);

ElbowVal = analogRead(ElbowPin);

ThumbVal = map(ThumbVal, 520, 650, 0, 180);

PointerVal = map(PointerVal, 530, 850, 0, 180);

MiddleVal = map(MiddleVal, 430, 570, 0, 180);

RingVal = map(RingVal, 510, 830, 0, 180);

PinkyVal = map(PinkyVal, 940, 960, 0, 180);

//PinkyVal = PinkyVal / 2;

//elbow not calculated

ElbowVal = 0;

output = String(orientation) + "/" + String(ThumbVal);

output = output + "/" + String(PointerVal) + "/" + String(MiddleVal);

output = output + "/" + String(RingVal) + "/" + String(PinkyVal);

output = output + "/" + String(ElbowVal) + ".";

if(Serial1.read() > 0){

ACA[0][x] = ThumbVal;

ACA[1][x] = PointerVal;

ACA[2][x] = MiddleVal;

ACA[3][x] = RingVal;

ACA[4][x] = PinkyVal;

x += 1;

if(x > 4){

int AVG = 0;

for(int w = 0; w < 5; w++){

for(int t = 0; t < 5; t++){

AVG += ACA[w][t];

}

AVG = AVG / 5;

avg[w] = AVG;

AVG = 0;

}

x = 0;

output = String(orientation) + "/" + String(avg[0]);

output = output + "/" + String(avg[1]) + "/" + String(avg[2]);

output = output + "/" + String(avg[3]) + "/" + String(avg[4]);

output = output + "/" + String(ElbowVal) + ".";

Serial1.println(output);

Serial.println(output);

}

}else{

Serial1.println(output);

//Serial.println(output);

delay(1000);

}

// if the orientation has changed, print out a description:

lastOrientation = orientation;

}