

File: C:\Users\M4rc05\Documents\Vex\Starstruck\2223-G\3-29-2017\PID test.c

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#pragma config(Sensor, dgtl1, RightEncoder, sensorQuadEncoder)
#pragma config(Sensor, dgtl3, LeftEncoder, sensorQuadEncoder)
#pragma config(Motor, port1, RightMotor, tmotorVex393_HBridge, openLoop, encoderPort, dgtl1)
#pragma config(Motor, port10, LeftMotor, tmotorVex393_HBridge, openLoop, reversed, encoderPort, dgtl3)
/*!!Code automatically generated by 'ROBOTC' configuration wizard !!*/

int errorLeft = 0, errorRight = 0;
int priorErrorLeft = 0, priorErrorRight = 0;
int integralLeft = 0, integralRight = 0;
int derivativeLeft = 0, derivativeRight = 0;

float KP = 1, KI = 1, KD = 100, bias = 0;

int iterationTime = 1;
int outputLeft = 0, outputRight = 0;
int pulses = 360, maxSpeed = 127;

task main() {
    clearDebugStream();
    for(int c=1; -(SensorValue[RightEncoder])<= pulses || SensorValue[LeftEncoder]<=pulses; c++){ //loop to run until encoders are equal or greater t
        //(run until one revolution completed)
        errorLeft = pulses + SensorValue[LeftEncoder];
        errorRight = pulses - SensorValue[RightEncoder];
        if (errorLeft<=pulses/20) integralLeft += (errorLeft * iterationTime*.001);
        if (errorRight<=pulses/20) integralRight += (errorRight * iterationTime*.001);
        derivativeLeft = (errorLeft - priorErrorLeft)/iterationTime*.001;
        derivativeRight = (errorRight - priorErrorRight)/iterationTime*.001;
        outputLeft = KP*errorLeft + KI*integralLeft + KD*derivativeLeft+bias;
        outputRight = KP*errorRight + KI*integralRight + KD*derivativeRight + bias;
        priorErrorLeft = errorLeft;
        priorErrorRight = errorRight;
        if(outputLeft > maxSpeed) outputLeft = maxSpeed; else if (outputLeft < -(maxSpeed)) outputLeft = -(maxSpeed);
        if(outputRight > maxSpeed) outputRight = maxSpeed; else if (outputRight < -(maxSpeed)) outputRight = -(maxSpeed);
        motor[LeftMotor] = outputLeft; //move the left motor forward
        motor[RightMotor] = outputRight; //move the right motor forward
        writeDebugStreamLine("%i\t%i",errorLeft,errorRight);
        wait1Msec(iterationTime);
        if (errorLeft>= -5 && errorLeft<=5 || errorRight>= -5 && errorRight<=5) break;
    }
    writeDebugStreamLine("Finished!");
}
```

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