import mraa

import paho.mqtt.client as mqtt

import time

import math

from Servo import \*

import sys,signal,atexit

import pyupm\_groveo2 as upmGroveo2

led\_red = mraa.Gpio(0)

led\_green = mraa.Gpio(2)

led\_blue = mraa.Gpio(3)

led\_red.dir(mraa.DIR\_OUT)

led\_green.dir(mraa.DIR\_OUT)

led\_blue.dir(mraa.DIR\_OUT)

myGroveO2 = upmGroveo2.GroveO2(2)

#exit handlers for oxy

def SIGINTHandler(signum, frame):

 raise SystemExit

def exitHandler():

 sys.exit(0)

atexit.register(exitHandler)

signal.signal(signal.SIGINT, SIGINTHandler)

def temp():

 B = 3975

 a0in = mraa.Aio(3)

 a0 = a0in.read()

 resistance = (1023-a0)\*10000.0/a0

 temp = 1/(math.log(resistance/10000.0)/B+1/298.15)-273.15

 return temp

def light():

 a1in = mraa.Aio(1)

 a1 = a1in.read()

 return a1

def oxy():

 voltage = myGroveO2.voltageValue()

 conc = voltage/201\*10000

 value = (conc/7.43)-43

 return value

def aerate():

 # Create a new servo object with a reference name

 myServo = Servo("First Servo")

 # Attaches the servo to pin 5 in Arduino Expansion board

 myServo.attach(5)

 myServo.setFrequency(50)

 myServo.setWidth(550,2000)

 #try:

 # Sweeps the servo motor forever

 while True:

 # From 0 to 180 degrees

 for angle in range(0,180):

 myServo.write(angle)

 time.sleep(0.005)

 # From 180 to 0 degrees

 for angle in range(180,-1,-1):

 myServo.write(angle)

 time.sleep(0.005)

 #except KeyboardInterrupt:

 #print "Aeration ended."

 if oxy()>=20.0:

 break

mqttc = mqtt.Client("python\_pub")

mqttc.connect("192.168.1.206",1883)

while True:

 time.sleep(1)

 if light() < 50:

 led\_blue.write(1)

 led\_green.write(0)

 led\_red.write(0)

 elif light() > 50 and light() < 390 :

 led\_green.write(1)

 led\_red.write(0)

 led\_blue.write(0)

 elif light() > 390 :

 led\_red.write(1)

 led\_green.write(0)

 led\_blue.write(0)

 if oxy()<20.0:

 aerate()