임베디드응용 및 실습

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과제 코드

import threading

import serial

import time

import RPi.GPIO as GPIO

PWMA = 18

AIN1 = 22

AIN2 = 27

PWMB = 23

BIN1 = 25

BIN2 = 24

SW1 = 5

SW2 = 6

SW3 = 13

SW4 = 19

GPIO.setwarnings(False)

GPIO.setmode(GPIO.BCM)

GPIO.setup(PWMA, GPIO.OUT)

GPIO.setup(AIN1, GPIO.OUT)

GPIO.setup(AIN2, GPIO.OUT)

GPIO.setup(PWMB, GPIO.OUT)

GPIO.setup(BIN1, GPIO.OUT)

GPIO.setup(BIN2, GPIO.OUT)

GPIO.setup(SW1, GPIO.IN, pull\_up\_down=GPIO.PUD\_DOWN)

GPIO.setup(SW2, GPIO.IN, pull\_up\_down=GPIO.PUD\_DOWN)

GPIO.setup(SW3, GPIO.IN, pull\_up\_down=GPIO.PUD\_DOWN)

GPIO.setup(SW4, GPIO.IN, pull\_up\_down=GPIO.PUD\_DOWN)

L\_Motor = GPIO.PWM(PWMA, 500)

R\_Motor = GPIO.PWM(PWMB, 500)

L\_Motor.start(0)

R\_Motor.start(0)

bleSerial = serial.Serial("/dev/ttyS0", baudrate=9600, timeout=1.0)

gData = ""

def move\_forward():

    GPIO.output(AIN1, 0)

    GPIO.output(AIN2, 1)

    GPIO.output(BIN1, 0)

    GPIO.output(BIN2, 1)

    L\_Motor.ChangeDutyCycle(100)

    R\_Motor.ChangeDutyCycle(100)

def move\_backward():

    GPIO.output(AIN1, 1)

    GPIO.output(AIN2, 0)

    GPIO.output(BIN1, 1)

    GPIO.output(BIN2, 0)

    L\_Motor.ChangeDutyCycle(100)

    R\_Motor.ChangeDutyCycle(100)

def move\_left():

    GPIO.output(AIN1, 1)

    GPIO.output(AIN2, 0)

    GPIO.output(BIN1, 0)

    GPIO.output(BIN2, 1)

    L\_Motor.ChangeDutyCycle(100)

    R\_Motor.ChangeDutyCycle(100)

def move\_right():

    GPIO.output(AIN1, 0)

    GPIO.output(AIN2, 1)

    GPIO.output(BIN1, 1)

    GPIO.output(BIN2, 0)

    L\_Motor.ChangeDutyCycle(100)

    R\_Motor.ChangeDutyCycle(100)

def stop\_motor():

    L\_Motor.ChangeDutyCycle(0)

    R\_Motor.ChangeDutyCycle(0)

def serial\_thread():

    global gData

    while True:

        data = bleSerial.readline()

        data = data.decode('utf-8', 'replace').strip()

        gData = data

def main():

    global gData

    try:

        while True:

            if gData == "go":

                gData = ""

                move\_forward()

            elif gData == "back":

                gData = ""

                move\_backward()

            elif gData == "left":

                gData = ""

                move\_left()

            elif gData == "right":

                gData = ""

                move\_right()

            elif gData == "stop":S

                gData = ""

                stop\_motor()

            elif GPIO.input(SW1) == GPIO.HIGH:

                print("SW1 go")

                move\_forward()

            elif GPIO.input(SW2) == GPIO.HIGH:

                print("SW2 right")

                move\_right()

            elif GPIO.input(SW3) == GPIO.HIGH:

                print("SW3 left")

                move\_left()

            elif GPIO.input(SW4) == GPIO.HIGH:

                print("SW4 backward")

                move\_backward()

            else:

                stop\_motor()

            time.sleep(0.5)

    except KeyboardInterrupt:

        pass

if \_\_name\_\_ == "\_\_main\_\_":

    task1 = threading.Thread(target=serial\_thread)

    task1.start()

    main()

    bleSerial.close()

    GPIO.cleanup()

Serial\_thread 부분 오류가 생겨 gpt를 사용해 도움을 얻었습니다. [data.decode('utf-8')에서 유효하지 않은 UTF-8 바이트 시퀀스를 디코딩하려고 할 때 발생합니다. Bluetooth 모듈에서 수신하는 데이터가 UTF-8 형식이 아닐 수 있으므로, 디코딩 과정에서 에러를 일으키는 특정 바이트를 무시하도록 설정할 수 있습니다.] 이러한 답을 얻어  data = data.decode('utf-8', 'replace').strip() < 코드를 추가하였습니다.