

# 임베디드 응용 및 실습

- 8주차 과제 -

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### (과제) Bluetooth 통신으로 움직이는 자동차 만들기

- 명령을 위한 "go, back, left, right, stop" 함수 구현
- BT app.에서 버튼과 명령을 mapping
- 버튼이 눌리면 명령(ex. Right)가 자동차로 전송, serial\_thread 함수에서 받아 gData에 할당
- Main 함수에서 gData 값에 따라 적절한 함수를 호출하여 자동차 구동

B3 → 앞

B2 → 뒤

B4 → 왼쪽 바퀴

B1 → 오른쪽 바퀴

B0 → 정지

#### 코드

```
1  import threading
2  import serial
3  import time
4  import RPi.GPIO as GPIO
5
6  PWMA = 18
7  PWMB = 23
8  AIN1 = 22
9  AIN2 = 27
10 BIN1 = 25
11 BIN2 = 24
12
13 GPIO.setwarnings(False)
14 GPIO.setmode(GPIO.BCM)
15 GPIO.setup(PWMA,GPIO.OUT)
16 GPIO.setup(PWMB,GPIO.OUT)
17 GPIO.setup(AIN1,GPIO.OUT)
18 GPIO.setup(AIN2,GPIO.OUT)
19 GPIO.setup(BIN1,GPIO.OUT)
20 GPIO.setup(BIN2,GPIO.OUT)
21
22 L_Motor = GPIO.PWM(PWMA,500)
23 R_Motor = GPIO.PWM(PWMB,500)
24 L_Motor.start(0)
25 R_Motor.start(0)
26
27 bleSerial = serial.Serial("/dev/ttyS0", baudrate=9600, timeout=1.0)
28
29 gData = ""
30
```

```
31 def go_straight():
32     GPIO.output(AIN1,0)
33     GPIO.output(AIN2,1)
34     GPIO.output(BIN1,0)
35     GPIO.output(BIN2,1)
36     L_Motor.ChangeDutyCycle(50)
37     R_Motor.ChangeDutyCycle(50)
38     time.sleep(1.0)
39
40 def go_back():
41     GPIO.output(AIN1,1)
42     GPIO.output(AIN2,0)
43     GPIO.output(BIN1,1)
44     GPIO.output(BIN2,0)
45     L_Motor.ChangeDutyCycle(50)
46     R_Motor.ChangeDutyCycle(50)
47     time.sleep(1.0)
48
49 def left_wheel():
50     GPIO.output(AIN1,0)
51     GPIO.output(AIN2,1)
52     L_Motor.ChangeDutyCycle(50)
53     time.sleep(1.0)
54
55 def right_wheel():
56     GPIO.output(BIN1,0)
57     GPIO.output(BIN2,1)
58     R_Motor.ChangeDutyCycle(50)
59     time.sleep(1.0)
60
61 def stop():
62     GPIO.output(AIN1,0)
63     GPIO.output(AIN2,1)
64     GPIO.output(BIN1,0)
65     GPIO.output(BIN2,1)
66     L_Motor.ChangeDutyCycle(0)
67     R_Motor.ChangeDutyCycle(0)
68     time.sleep(1.0)
69
```

```

70 def serial_thread():
71     global gData
72     while True:
73         data = bleSerial.readline()
74         data = data.decode()
75         gData = data
76

```

```

77 def main():
78     global gData
79     try:
80         while True:
81             if gData.find("B3") >= 0:
82                 gData = ""
83                 go_straight()
84                 print("ok go")
85             elif gData.find("B2") >= 0:
86                 gData = ""
87                 go_back()
88                 print("ok back")
89             elif gData.find("B4") >= 0:
90                 gData = ""
91                 left_wheel()
92                 print("ok left")
93             elif gData.find("B1") >= 0:
94                 gData = ""
95                 right_wheel()
96                 print("ok right")
97             elif gData.find("B0") >= 0:
98                 gData = ""
99                 stop()
100                 print("ok stop")
101
102         except KeyboardInterrupt:
103             pass
104
105 if __name__ == '__main__':
106     task1 = threading.Thread(target = serial_thread)
107     task1.start()
108     main()
109     bleSerial.close()

```

실행 영상 터미널

```
wodbs@wodbs:~/lec7 $ python 4_4_1.py
ok go
ok stop
ok back
ok stop
ok left
ok stop
ok right
ok stop
█
```