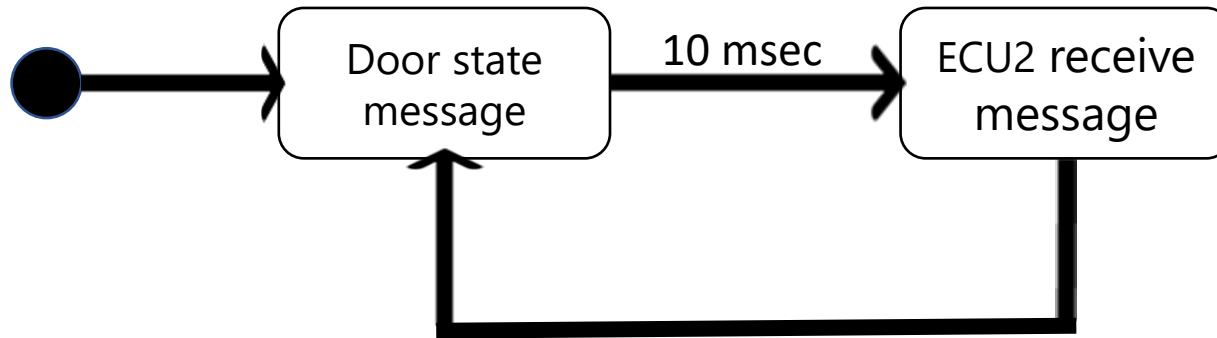# Dynamic Design

For ECU 1:

1-Draw a state machine diagram for each ECU component

a)

```
  ●━━━━▶ ┌─────────────┐   10 msec   ┌─────────────┐
         │ Door state  │━━━━━━━━━━━▶ │ ECU2 receive│
         │  message    │             │   message   │
         └─────────────┘             └─────────────┘
                ▲                            │
                └────────────────────────────┘
```

b)

```
  ●━━━━▶ ┌──────────────┐   20 msec   ┌─────────────┐
         │ Light switch │━━━━━━━━━━━▶ │ ECU2 receive│
         │state message │             │   message   │
         └──────────────┘             └─────────────┘
                ▲                            │
                └────────────────────────────┘
```

For ECU 1:

c)

2-Draw a state machine diagram for the ECU operation
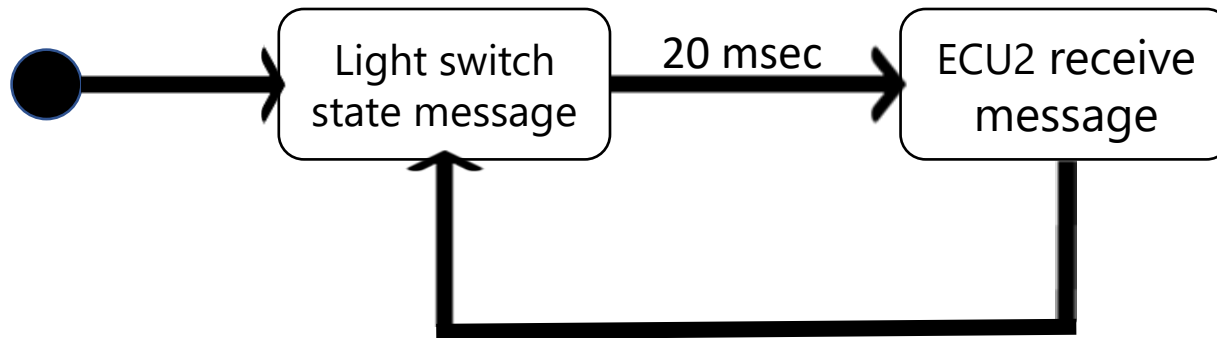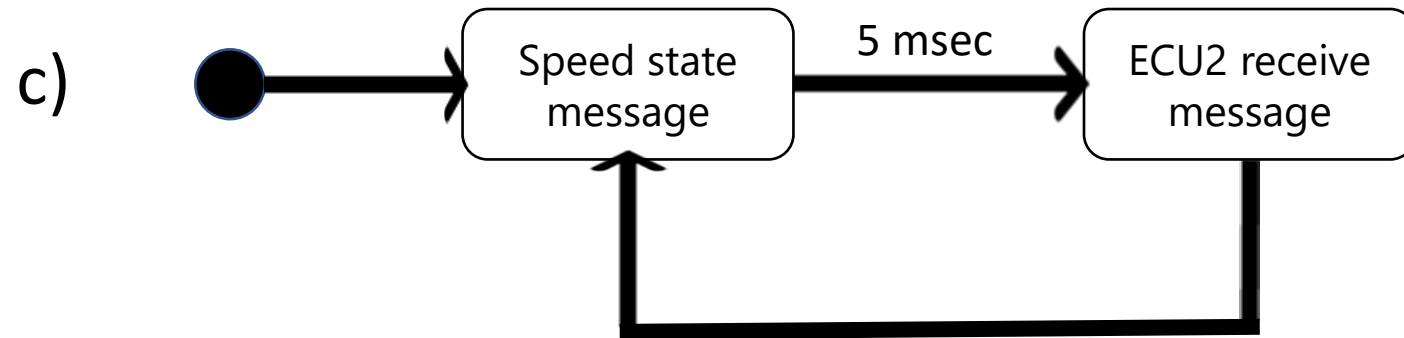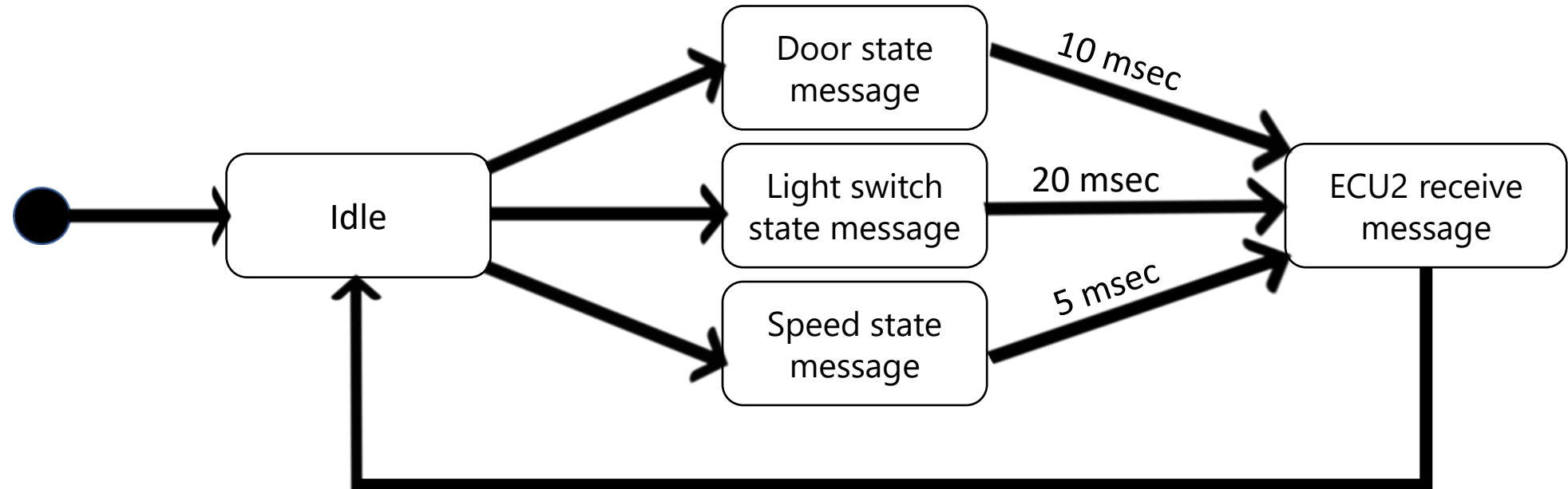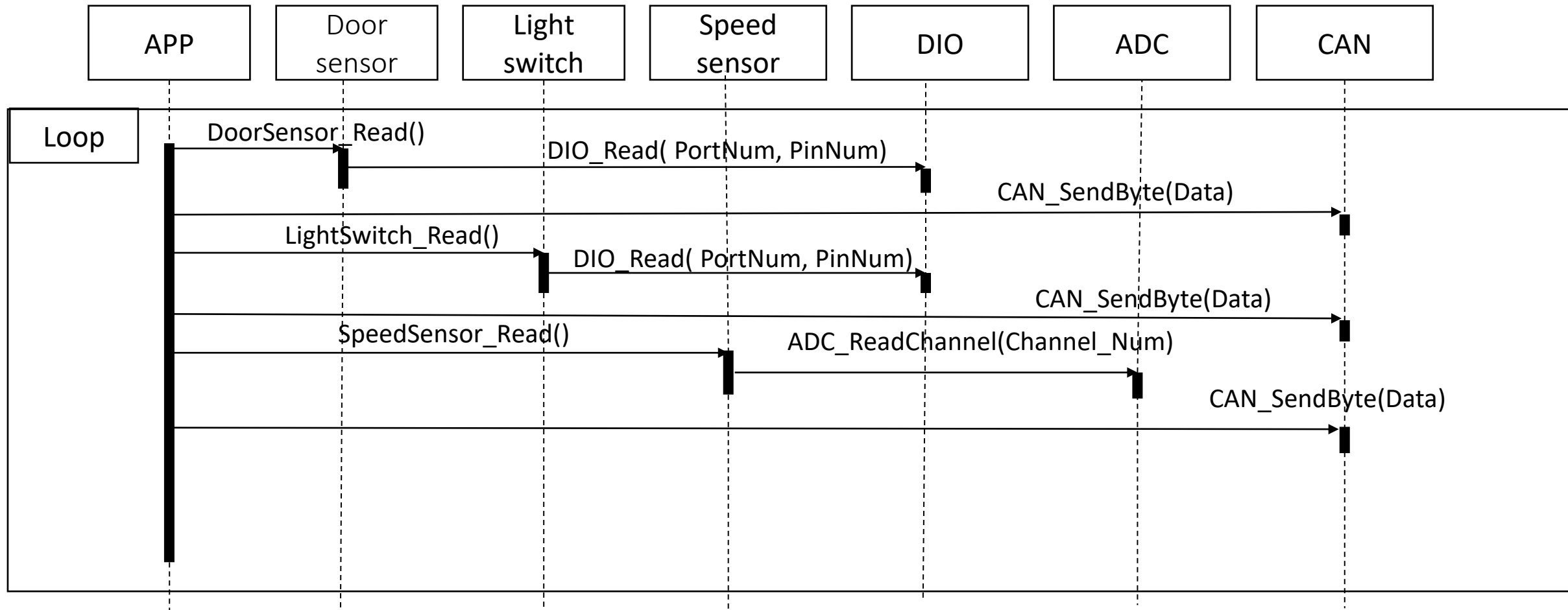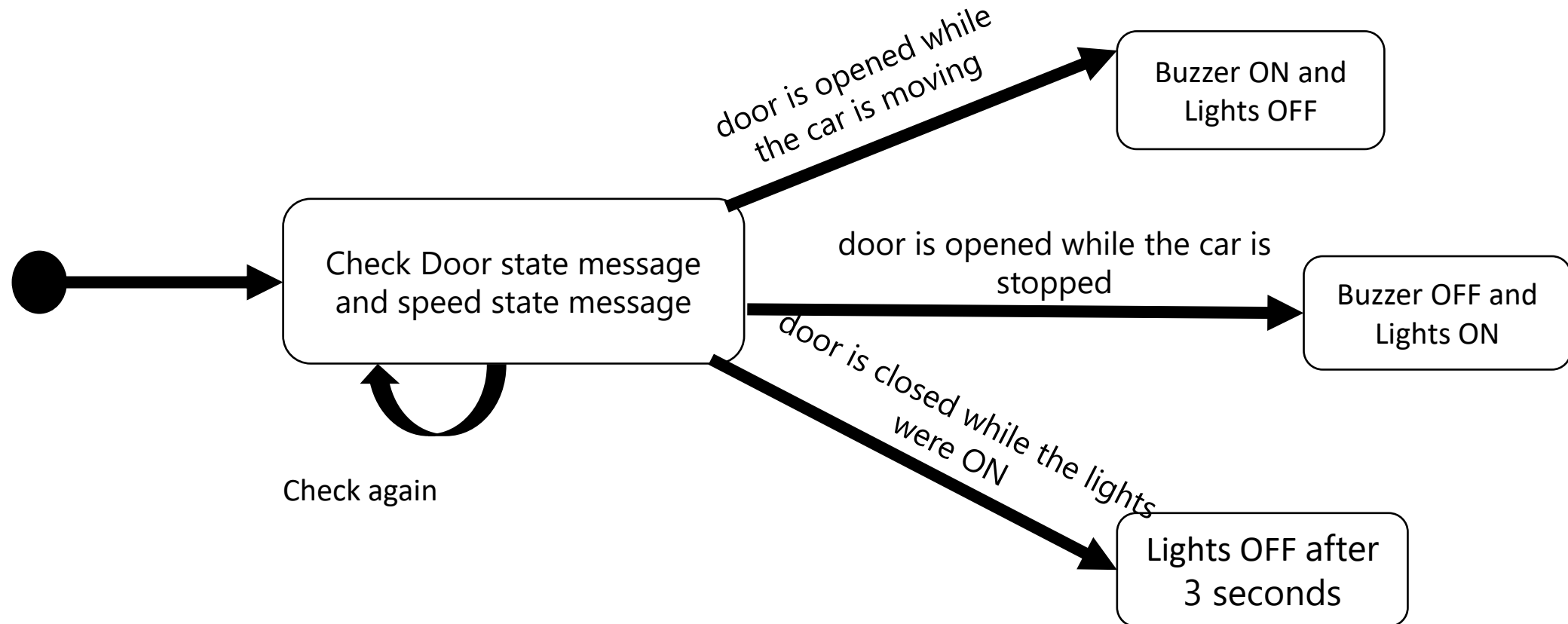
For ECU 1:

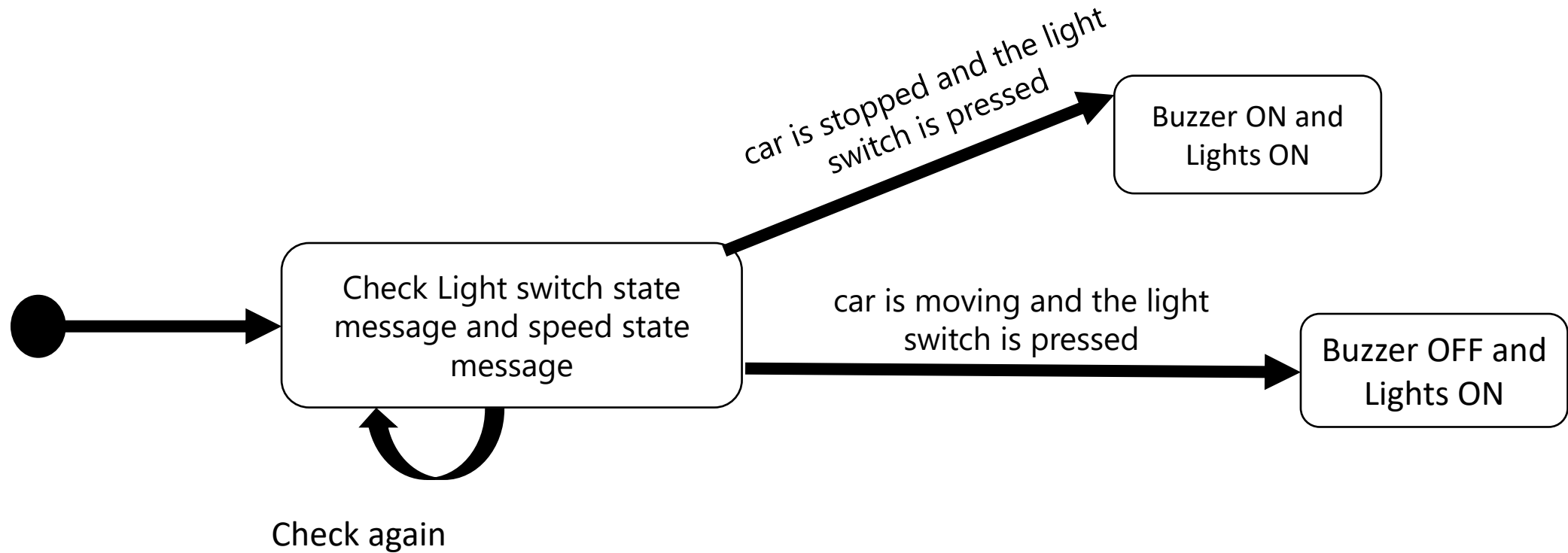3-Draw the sequence diagram for the ECU

For ECU 2:
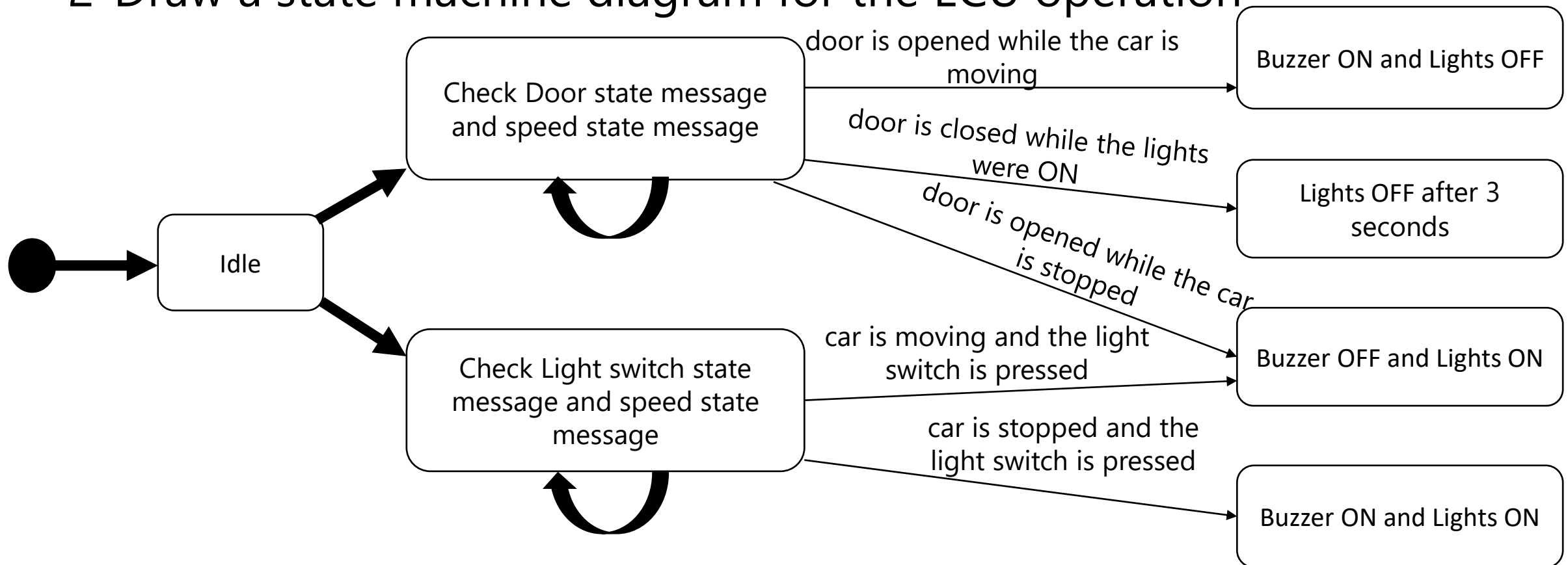
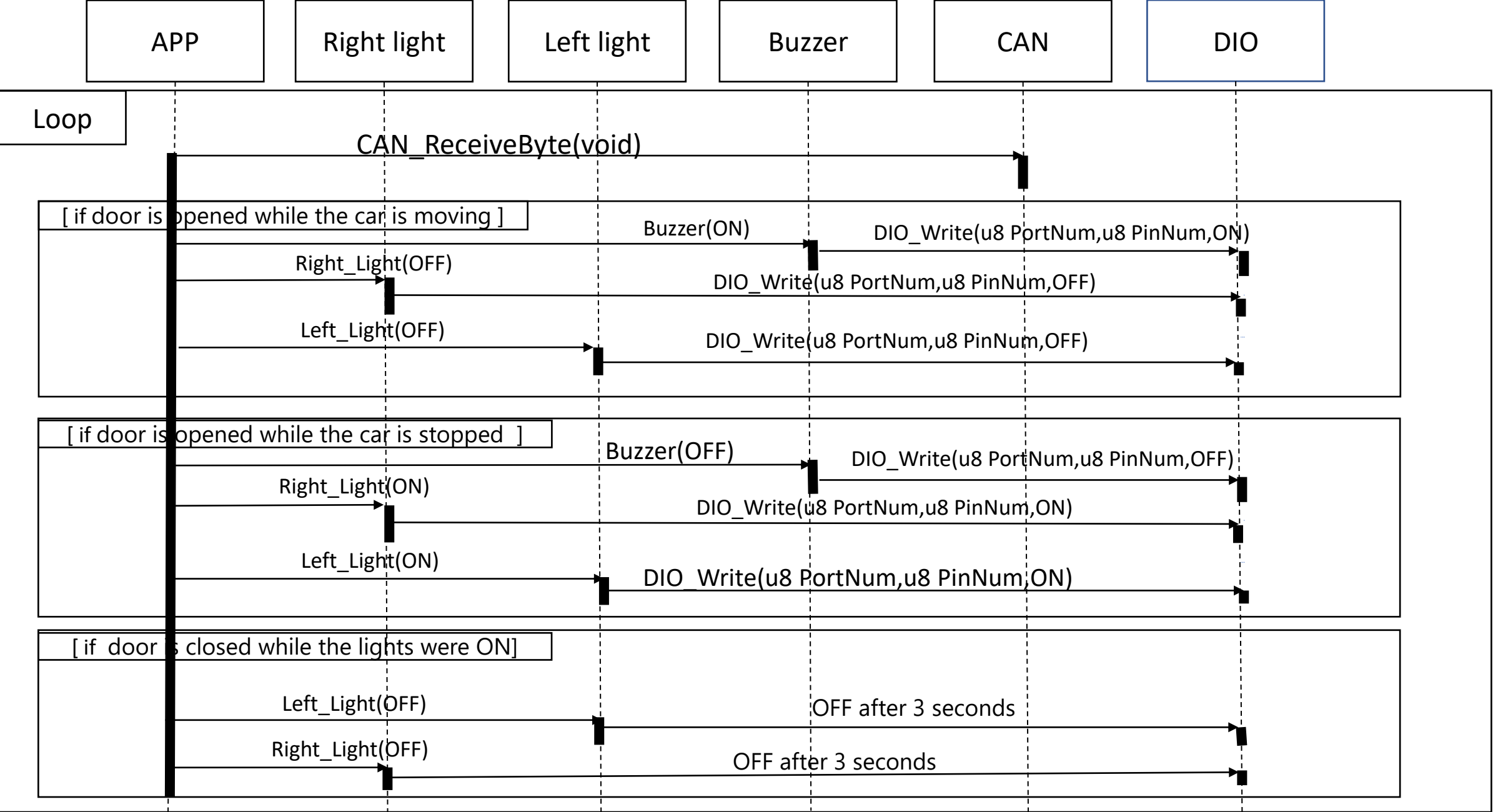## a)Draw a state machine diagram for each ECU component

For ECU 2:

For ECU 2:

2-Draw a state machine diagram for the ECU operation

For ECU 2:

```
APP          Right light    Left light      Buzzer          CAN            DIO
```

Loop

CAN_ReceiveByte(void)

[if door is opened while the car is moving]

Buzzer(ON) → DIO_Write(u8 PortNum,u8 PinNum,ON)

Right_Light(OFF) → DIO_Write(u8 PortNum,u8 PinNum,OFF)

Left_Light(OFF) → DIO_Write(u8 PortNum,u8 PinNum,OFF)

[if door is opened while the car is stopped]

Buzzer(OFF) → DIO_Write(u8 PortNum,u8 PinNum,OFF)

Right_Light(ON) → DIO_Write(u8 PortNum,u8 PinNum,ON)

Left_Light(ON) → DIO_Write(u8 PortNum,u8 PinNum,ON)

[if door is closed while the lights were ON]

Left_Light(OFF) → OFF after 3 seconds

Right_Light(OFF) → OFF after 3 seconds

For ECU 2:

Continue: