```
uint8_t Button1_GetState()
{
    static uint8_t prevState = 1;
    uint8_t curState = BUTTON_PIN & (1<<BUTTON_NEXT);
                       00000000
    if((curState == 0) && (prevState == 1))
    {
        prevState = 0;
        return 0;
    }
    else if((curState != 0) && (prevState == 0))
    {
        prevState = 1;
        return 1;
    }
    return 0;
```

경우 1 안눌러짐

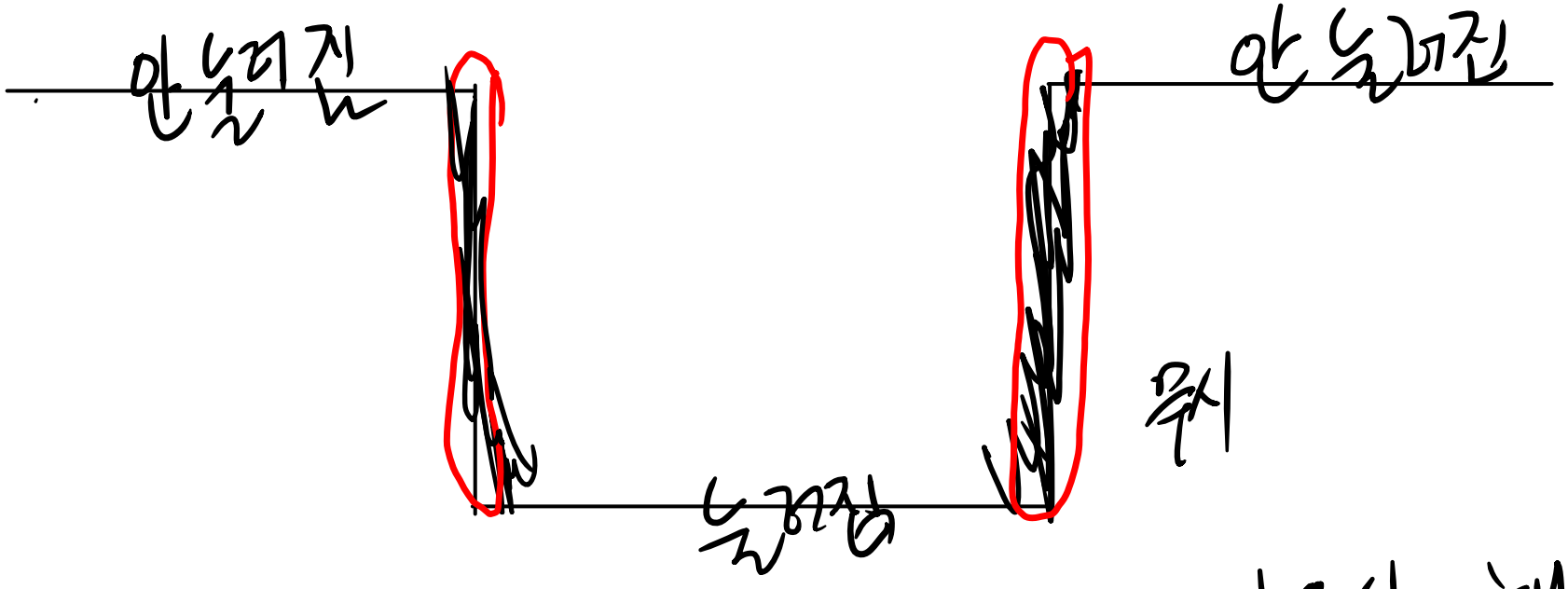
P: 1 C: 1

경우 2 누르고 있음

P: 0 C: 0

경우 3 눌렀다 뗌

P: 0 C: 1



바운싱, 채터링

해결책 SW 무지

HW 커패시터

```c
uint8_t Button1_GetState()
{
    static uint8_t prevState = 1;
    uint8_t curState = BUTTON_PIN & (1<<BUTTON_NEXT);

    if((curState == 0) && (prevState == 1))
    {
        _delay_ms(10);
        prevState = 0;
        return 1;
    }
    else if((curState != 0) && (prevState == 0))
    {
        _delay_ms(10);
        prevState = 1;
        return 0;
    }
    return 0;
}
```

```c
uint8_t Button2_GetState()
{
    static uint8_t prevState = 1;
    uint8_t curState = BUTTON_PIN & (1<<BUTTON_PREV);

    if((curState == 0) && (prevState == 1))
    {
        _delay_ms(10);
        prevState = 0;
        return 1;
    }
    else if((curState != 0) && (prevState == 0))
    {
        _delay_ms(10);
        prevState = 1;
        return 0;
    }
    return 0;
}
```

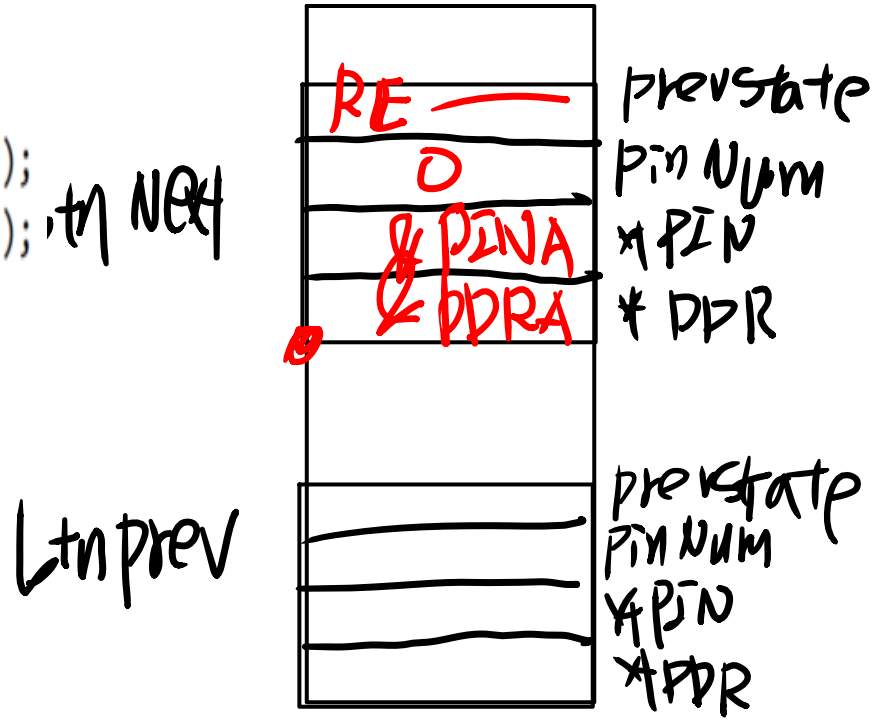
1. prevState 2. PIN 3. Pin Number

```c
typedef struct _button
{
    volatile uint8_t *DDR;
    volatile uint8_t *PIN;
    uint8_t pinNum;
    uint8_t prevState;
}button_t;
```

```c
void Button_init(button_t *btn, volatile uint8_t *ddr,
volatile uint8_t *pin, uint8_t pinNum)
{
    btn->DDR = ddr;
    btn->PIN = pin;
    btn->pinNum = pinNum;
    btn->prevState = RELEASED;
    *btn->DDR &= ~(1<<btn->pinNum);
}
```

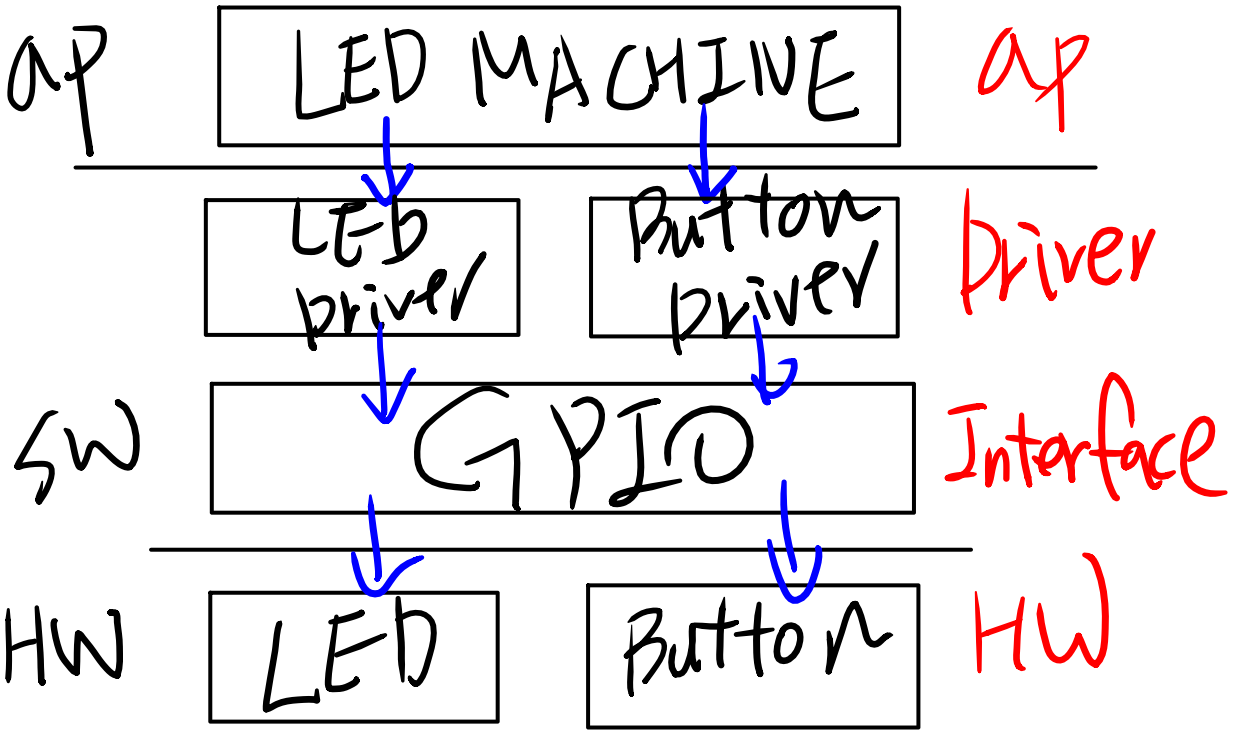
```c
button_t btnNext , btnPrev;

Button_init(&btnNext, &DDRA, &PINA, 0);
Button_init(&btnPrev, &DDRA, &PINA, 1);
```

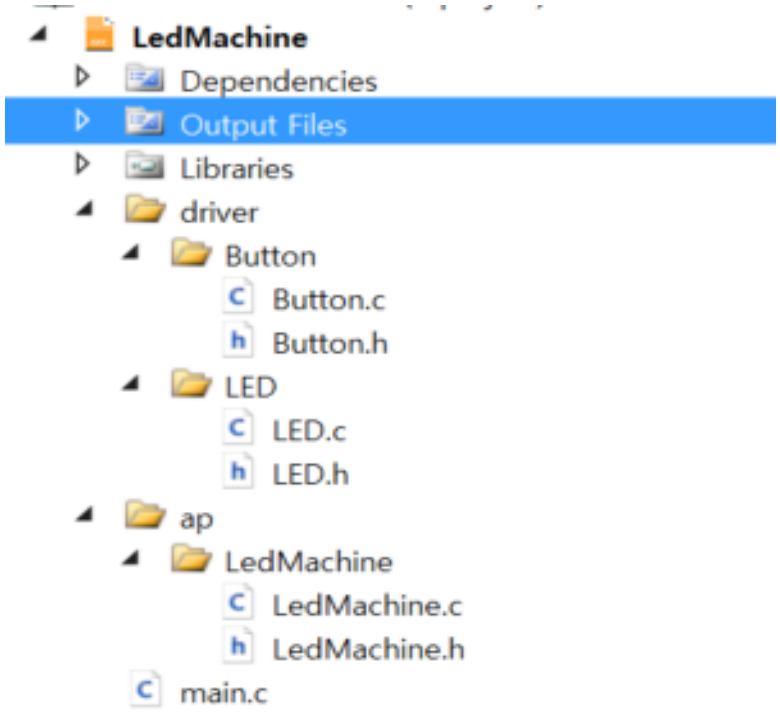
button_t *btn = &btnNext;
uint8_t *ddr = &DDRA;
uint8_t *pin = &PINA;
uint8_t pinNum = 0;

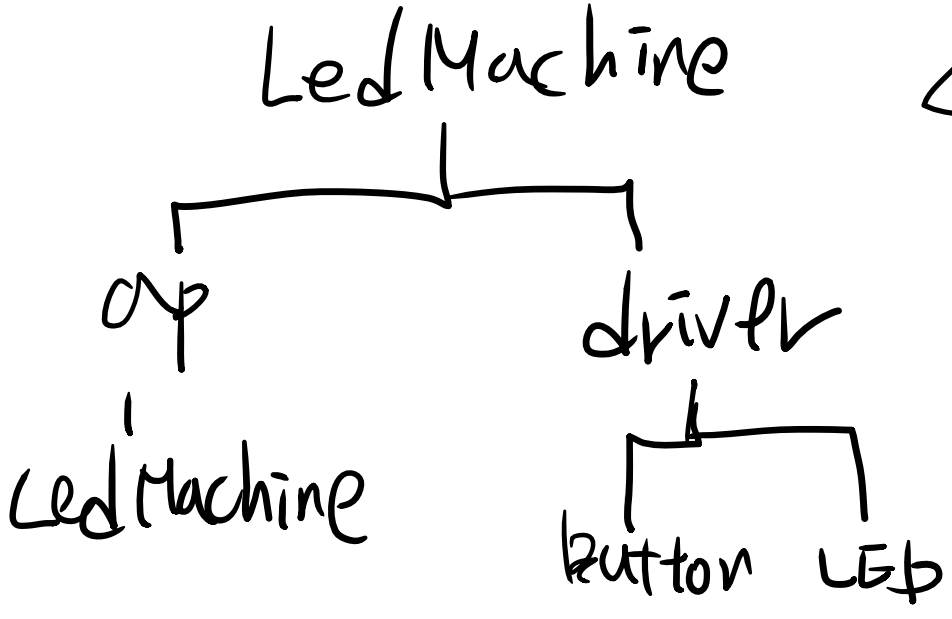


btnNext

btnPrev



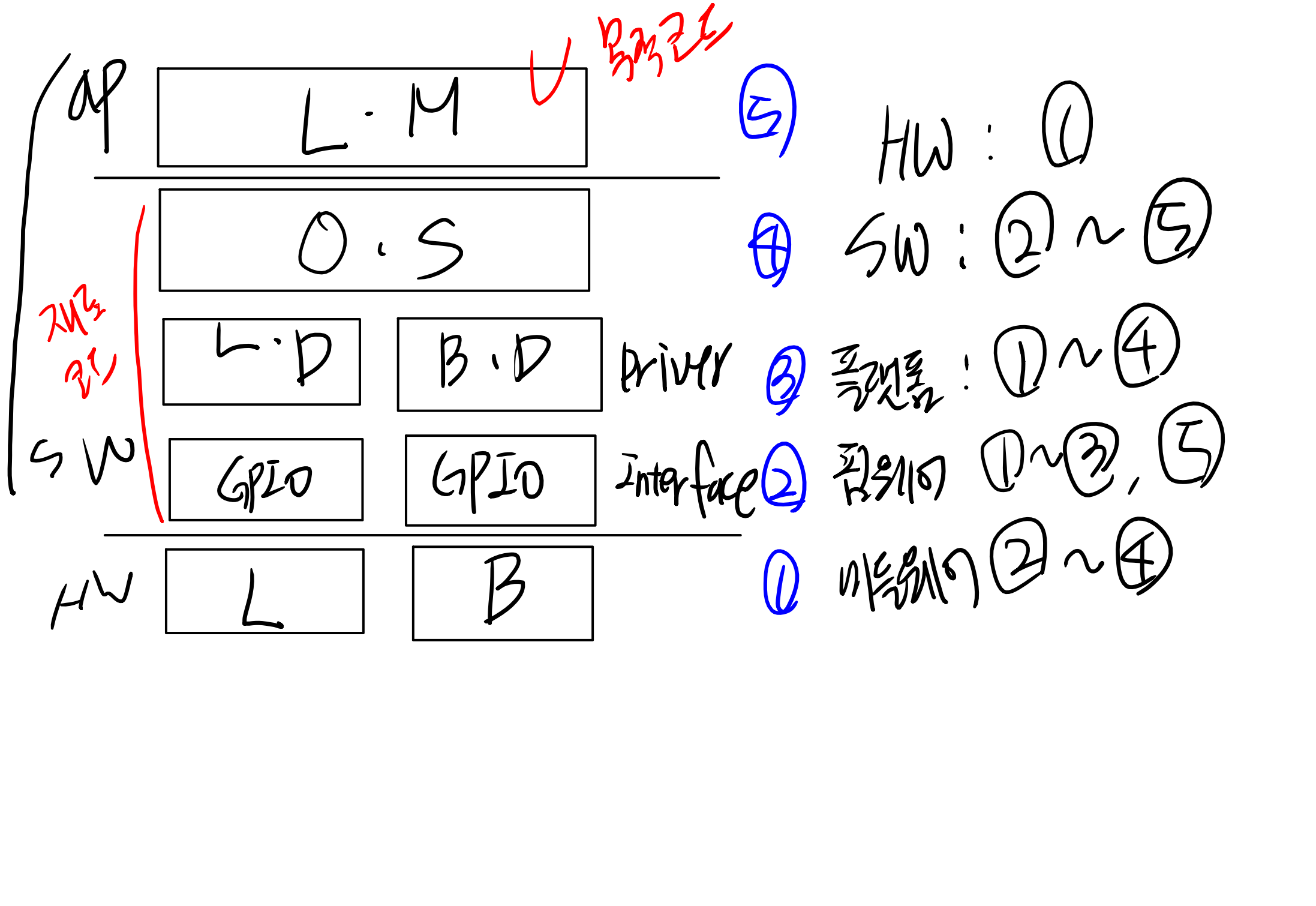


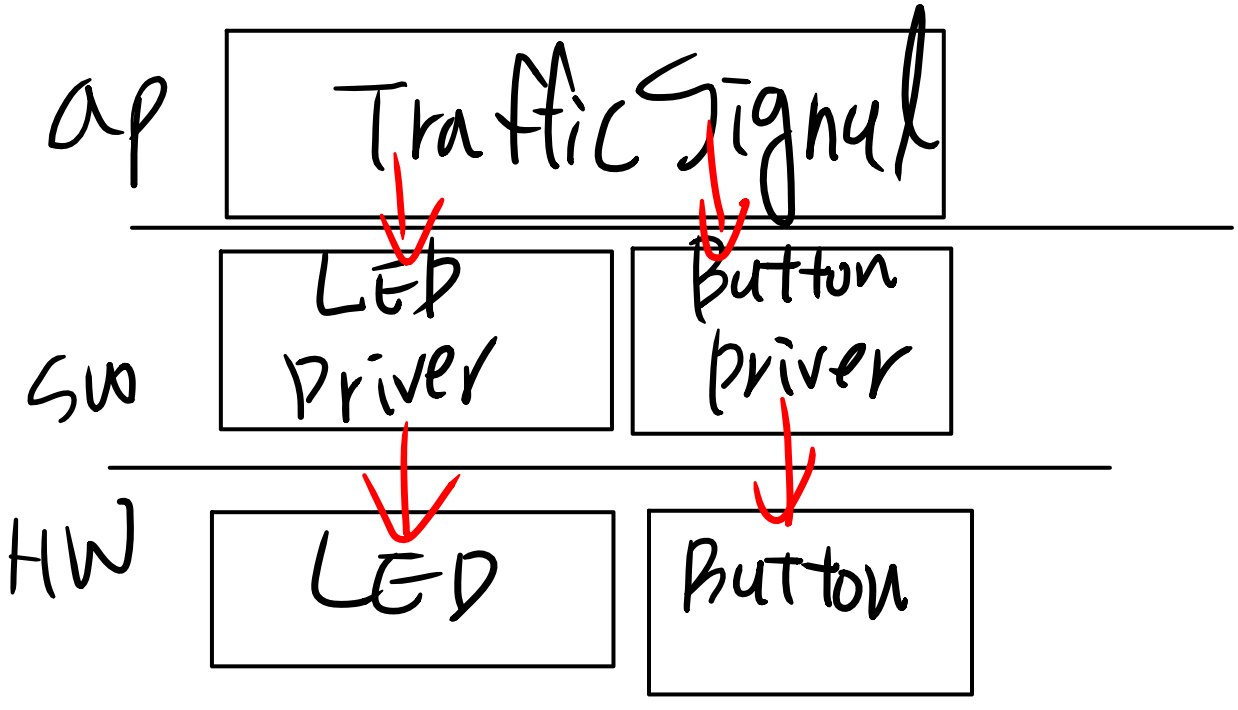


SW STACK

① 독립적.

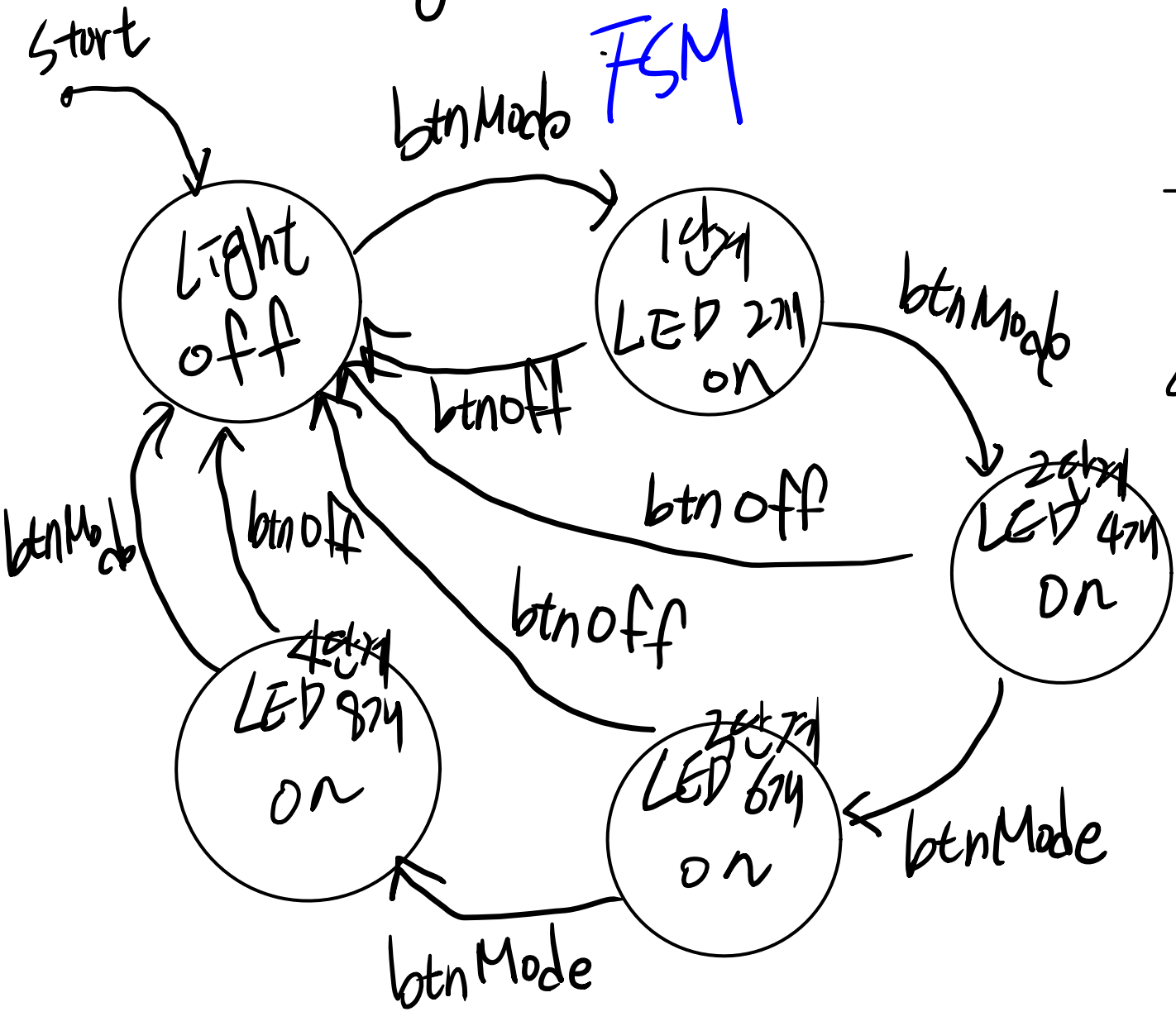
② 결합 X


AP
L · M
⑤
O · S
④
L · D
B · D
driver
③
GPIO
GPIO
interface
②
SW
HW
L
B
①
HW : ①
SW : ② ~ ⑤
드라이버 : ① ~ ④
인터페이스 ① ~ ③, ⑤
하드웨어 ② ~ ④

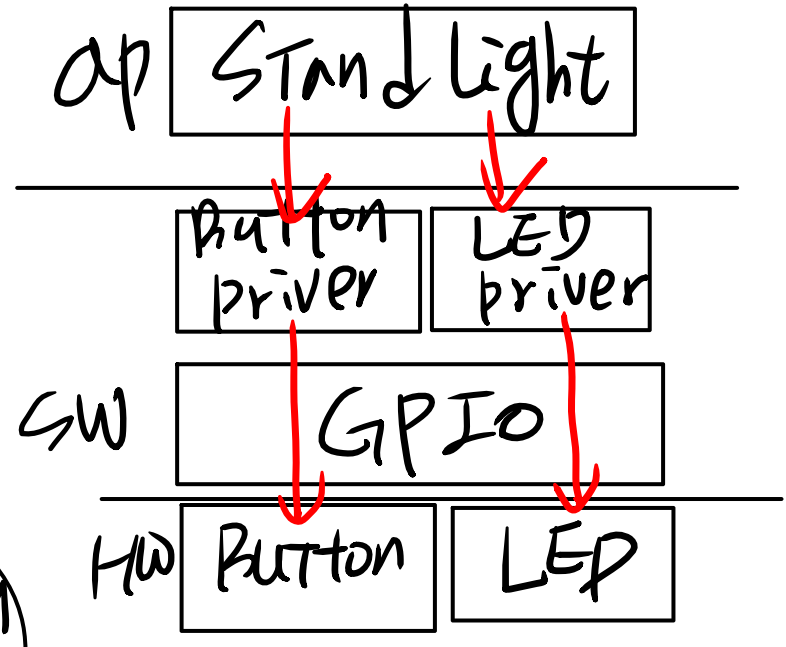

ap
Traffic Signal
SW
LED Driver
Button Driver
HW
LED
Button

STAND Light

FSM



SW STACK



1. Button - getState
   Button - Init) 함수 분석

2. Led Machine FSM / SWSTACK 보고
   다시 만들어보기

3. Traffic Signal 다시 만들어보기

4. Stand Light 만들기