EOS LAB3 REPORT

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1. Driver 實作

目的:將 writer 傳送過來的學號數值給存起來並轉成二進制形式顯示於 LED

針對原本 driver 進行修改，僅修改 etx_writer 的部分

```
static ssize_t etx_write(struct file *filp, const char __user *buf, size_t len, loff_t *off)
{
    uint8_t rec_buf[10] = {0};
    if (copy_from_user(rec_buf, buf, len) > 0) {
        pr_err("ERROR: Not all the bytes have been copied from user\n");
    }

    pr_info("Write Function: Student ID = %d\n", student_id);

    int num = atoi(rec_buf);
    int leds = 0;
    for (int i = 0; i < 4; i++) {
        if (num & (1 << i)) {
            gpio_set_value(gpio_leds[i], 1);
        }
        else
            gpio_set_value(gpio_leds[i], 0);
    }

    pr_info("Write Function : LEDs Set = %d\n", num);

    return len;
}
```

首先將 writer 傳過來的字串轉換為二進位數字後，用位與的方式來判斷每個位置是否為一或是零，最後分別對四個角位設定

2. Writer 實作

將輸入指令讀到的第二個值轉成字元後每隔一秒送給 driver。中間會對輸入格式、檔案是否開啟以及是否寫入成功做檢查

```c
#include <stdio.h>
#include <stdlib.h>
#include <fcntl.h>
#include <unistd.h>
#include <string.h>

#define DEVICE_PATH "/dev/etx_device"
#define BUFFER_SIZE 1

int main(int argc, char *argv[]) {
    int fd;
    char buffer[BUFFER_SIZE];
    int i;

    if (argc != 2) {
        fprintf(stderr, "Usage: %s <string>\n", argv[0]);
        return -1;
    }

    fd = open(DEVICE_PATH, O_WRONLY);
    if (fd < 0) {
        perror("Failed to open the device file");
        return -1;
    }

    for (i = 0; i < strlen(argv[1]); i++) {
        buffer[0] = argv[1][i];

        // Write to the device file
        if (write(fd, buffer, sizeof(buffer)) < 0) {
            perror("Failed to write to the device file");
            close(fd);
            return -1;
        }

        sleep(1);
    }

    close(fd);

    return 0;
}
```