

Lab4 – A 7-segment driver

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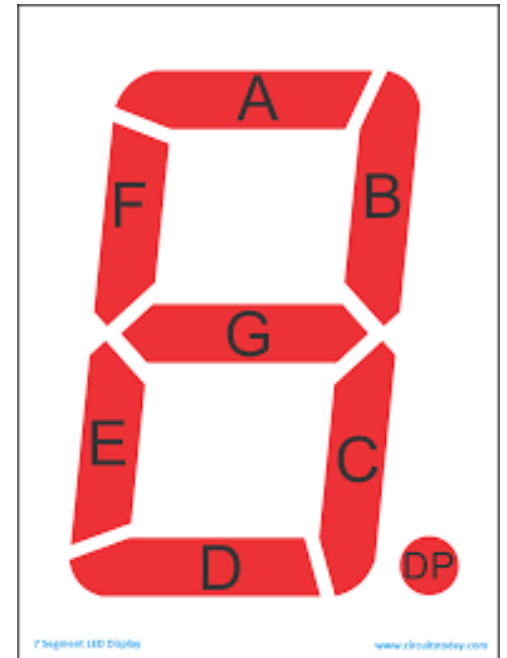
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Lab4 Requirements

- 一個七段顯示器的driver
 - 將writer所寫入的指令轉換為七段顯示器的顯示資訊
 - 當reader讀取時提供最新顯示資訊
- 一隻Writer的程式
 - 將參數每個三秒寫入一次device
 - 每次write一個指令(e.g. A)
 - `./writer 1234567890abcdefABCDEFggggg`

助教已完成部分

- Reader – socket client
 - 對device做read
 - 期望會拿到七段顯示器的顯示資訊，一個長度為7的陣列Array
 - Array[0]代表a段亮(1)/暗(0), Array[1]代表b段亮(1)/暗(0), ...
 - 將顯示資訊透過socket傳給server
 - ./reader [server_ip] [port] [device_path] &
 - “&” 代表背景執行，欲將其回到前景則輸入指令 fg
- Seg.py – socket server
 - 當作七段顯示器
 - 透過socket接收reader所傳來之七段顯示器顯示資訊



Network configuration with ip tool

- Enable Network interface
 - `ip link set eth0 up`
- Set ip address
 - `ip addr add [ip]/24 dev eth0`
- Set default route
 - `ip route add default via [gw_ip]`
- Others
 - <https://www.tecmint.com/ip-command-examples/>

Run Seg.py

- Install python2.7
 - `sudo apt-get install python2.7`
- Install tkinter
 - `sudo apt-get install python-tk`
- Run
 - `python seg.py [port]`

Tftp on ZC702

- Get a file from remote tftp server
 - `tftp -g -r [filename] [server_ip]`

Data copy between kernel and user space

- `copy_from_user(void* to, const void __user * from, unsigned long n)`
 - Copy a block of data from user space
- `copy_to_user(void __user * to, const void * from, unsigned long n)`
 - Copy a block of data into user space

Hints

- Add option “--static” when you compile
- Driver需要定義的operation: read, write
- Demo SOP:
 - 板子: insmod, mknod
 - VM: python seg.py [port(8888)]
 - 板子: ./reader [ip] [port(8888)] [device_path] &
 - 板子: ./writer [testcases]

&: 背景執行，叫回前景輸入fg


```
static char map[16] = {  
    0b1111110, // 0  
    0b0110000, // 1  
    0b1101101, // 2  
    0b1111001, // 3  
    0b0110011, // 4  
    0b1011011, // 5  
    0b1011111, // 6  
    0b1110000, // 7  
    0b1111111, // 8  
    0b1111011, // 9  
    0b1110111, // A,a  
    0b0011111, // B,b  
    0b1001110, // C,c  
    0b0111101, // D,d  
    0b1001111, // E,e  
    0b1000111 // F,f  
};
```

七段顯示器顯示資訊表