Lab 5

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1. **Lab5.1 MAX7219 displayer**

用 C 語言去 Call Function

```c
int display(unsigned char *data, int num_digs)

{

    int i, n;

    n = (num_digs > 8) ? 8 : num_digs;

    for (i = 0; i < n; i++)

    {

        int digit;

        digit = data[num_digs-i-1] - 48;

        max7219_send(i+1, digit);

    }

    return (num_digs > 8) ? -1 : 0;

}

int main()

{

    unsigned char student_id[8] = "0616037";

    GPIO_init();
```

```
    max7219_init();

    display(student_id, 7);
}
```

2. Lab5.2 KaypadScanning

用雙層 for 迴圈去掃哪個按鍵背按

```
while (1)
    {
        int flag_keypad = GPIOB->IDR & 10111<<5;

        if (flag_keypad != 0)
        {
            int k = 40000, flag_debounce;

            while (k != 0)
            {
                flag_debounce = GPIOB->IDR & 10111<<5;

                k--;
            }

            if (flag_debounce != 0)
            {
                int position_c, position_r;

                for (int i = 0; i < 4; i++)
```

```c
{ //scan keypad from first column

    position_c = i+8;

    if (i == 3)

        position_c++;

    //set PA8,9,10,12(column) low and set pin high from PA8

    GPIOA->ODR = (GPIOA->ODR & 0xFFFFE8FF) | 1<<position_c;

    for (int j = 0; j < 4; j++)

    { //read input from first row

        position_r = j+5;

        if (j == 3)

            position_r++;

        int flag_keypad_r = GPIOB->IDR & 1<<position_r;

        if (flag_keypad_r != 0) display(table[j][i]);

    }

}
```

```
        }

        int a = GPIOB->IDR & 10111<<5;

        if (flag_keypad == 0)

            max7219_send(1, 15);

        keypad_init();

    }
```

3. Lab5.3 Multi buttons

for 掃兩次去看哪個按鈕被按下 如果偵測到兩個按鈕被按下就相加兩個按鈕的

總和

```
scan();

        while (press)

        {

            temp = 0;

            for (int i = 0; i < 4; i++)

            {

                for (int j = 0; j < 4; j++)

                {

                    if (pressed[j][i] && !temp)

                    {

                        pressed[j][i] = 0;
```

```c
                display(table[j][i]);

                temp = table[j][i];

            }

            else if (pressed[j][i] && temp && temp != table[j][i])

            {

                pressed[j][i] = 0;

                display(temp + table[j][i]);

                break;

            }

        }

}


keypad_init();

press = 0;

flag_keypad = 0;

flag_debounce = 0;

position_c = 0;

position_r =0 ;

flag_keypad_r = 0;
```

```
        scan();

}
```