微算機原理與實習 LCM顯示學號與姓名

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Outline

一、LCM顯示你的學號與(英文)姓名

二、學號與姓名左右移動

三、程式碼講解

一、**LCM**顯示你的學號與(英文)姓名

4070E021
Su-Yu,Xiang

二、學號與姓名左右移動(如附檔)

學號與姓名左右移動影片

三、程式碼講解

1.定義暫存器(參考資料手冊)

```
1 #define GPIO_ACT_PD        *((unsigned int *)0x001F6980)
2 #define GPIO_OEN_PD        *((unsigned int *)0x001F6984)
3 #define GPIO_OMOD_PD       *((unsigned int *)0x001F6988)
4 #define PAD_PD             *((unsigned int *)0x001F698C)
5 #define GPIO_DAT_PD        *((unsigned int *)0x001F6990)
6 #define GPIO_REN_PD        *((unsigned int *)0x001F6994)
7 #define GPIO_RS_PD         *((unsigned int *)0x001F6998)
8 #define GPIO_BR_PD         *((unsigned int *)0x001F699C)
9 #define GPIO_BS_PD         *((unsigned int *)0x001F69A0)
```

2.定義RS、E、RW、CleanSet

```
11 #define RS   0x0080
12 #define E    0x0040
13 #define RW   0x0020
14 #define CleanSet 0x0000
```

3.設定delay時間

```c
16 void delay1(unsigned int nCount)
17 {
18     unsigned int i;
19     for(i=0;i<nCount;i++);
20 }
```

4.宣告函數-輸出/入初始化設定

```
22 void CheckBusy(void) //BF ,CHACK BUSY FLAG
23 {
24     unsigned short int i=0x8000;
25     while(i&0x8000)
26     {
27         GPIO_ACT_PD = 0xFFFF; //Initialize GPIO_D outpot
28         GPIO_OMOD_PD = 0x0;
29         GPIO_OEN_PD = 0x0;
30
31         GPIO_DAT_PD = (RW + E);
32
33         GPIO_ACT_PD = 0xFF00; //Initialize GPIO_D input
34         GPIO_RS_PD = 0xFF00;
35         GPIO_REN_PD = 0xFF00;
36
37         i = PAD_PD;
38
39         GPIO_DAT_PD = CleanSet;
40         delay1(100000);
41     }
42 }
```

5.宣告寫入LCM的函數

```c
44  void WriteData(unsigned short int i)
45  {
46      GPIO_ACT_PD = 0xFFFF; //Initialize GPIO_D outpot
47      GPIO_OMOD_PD = 0x0;
48      GPIO_OEN_PD = 0x0;
49
50      GPIO_DAT_PD = ((i << 8) + RS + E);
51      GPIO_DAT_PD = CleanSet;
52      CheckBusy();
53  }
```

6.宣告寫入LCM的指令並呼叫初始化設定之副程式

```c
55  void WriteIns(unsigned short int instruction)
56  {
57      GPIO_ACT_PD = 0xFFFF; //Initialize GPIO_D outpot
58      GPIO_OMOD_PD = 0x0;
59      GPIO_OEN_PD = 0x0;
60
61      GPIO_DAT_PD = (instruction + E );
62      GPIO_DAT_PD = CleanSet;
63
64      CheckBusy();
65  }
```

7.宣告LCD各項設定參數

```
67  void InitialLCD(void)
68  {
69      WriteIns(0x3800);   //FUNCTION SET
70      WriteIns(0x3800);
71      WriteIns(0x3800);
72      WriteIns(0x3800);
73      WriteIns(0x0800);   // off display
74      WriteIns(0x0100);   // clear buffer
75      WriteIns(0x0e00);   // on display
76      WriteIns(0x0600);   // set input mode
77  }
```

8.宣告要在LCM顯示的文字，並透過for迴圈讓兩個陣列內的字串顯示出來

```c
90  void Display_2Line(int WordValue)
91  {
92    char L1[]="4070E021";
93    char L2[]="Su,Yi-Xiang";
94    char i;
95    WriteIns(0x3800);   //FUNCTION SET
96    WriteIns(0x0C00);   //DISPLAY CONTROL
97    WriteIns(0x0600);   //SET INPUT MODE
98
99    WriteIns(0x8000);   //1-LINE DD RAM SET Address
100   for(i=0;i<8;i++)
101     WriteData(L1[i]);
102
103   WriteIns(0xC000);   //2-LINE DD RAM SET Address
104   for(i=0;i<11;i++)
105     WriteData(L2[i]);
106 }
```

9.宣告LCM PortD各項設定

```
107  void LCMCMDWR(unsigned int cmd)
108  {
109       GPIO_ACT_PD = GPIO_ACT_PD | 0xFFE0;
110       GPIO_OEN_PD = GPIO_OEN_PD & 0x001F;
111       GPIO_OMOD_PD = GPIO_OMOD_PD | 0xFFE0;
112       GPIO_BR_PD = E;
113       GPIO_BR_PD = RS;
114       GPIO_BR_PD = RW;
115       GPIO_DAT_PD = cmd << 8;
116       delay1(100);
117       GPIO_BS_PD = E;
118       delay1(100);
119       GPIO_BR_PD = E;
120  }
```

10.主程式-(1)宣告次數、旗標、移動次數

```
122  int main()
123  {
124      InitialLCD();
125      int num=0;
126      int num1=0;        //Flag
127      int num2=3;        //設定移動幾次
```

10.主程式-(2)右移程式碼

```
128        while(1)
129        {
130            if(num1==0){
131                LCMCMDWR(0x1D);  //右移
132                delay1(1000);
133                num++;
134                if(num==num2){
135                    num1=1;
136                    continue;
137                }
138            }
```

11.主程式-(2)左移程式碼

```c
140                if(num1==1){
141                    LCMCMDWR(0x18);  //左移
142                    delay1(1000);
143                    num--;
144                    if(num==0){
145                        num1=0;
146                        continue;
147                    }
148                }
149        }
150        return 0;
151 }
```