實驗九電子鐘

實驗目的： Arduino UNO利用計時器顯示電子鐘於四合一七節顯示器上，並且能整合開關調整時間顯示模式。

實驗步驟：

1. 使用四合一七節顯示器來顯示現在時刻，顯示格式為”時時:分分”
2. 程式執行後七節顯示器顯示"00:00"，開關1壓下放開，顯示“時時:分分”，再壓一次放開顯示 “分分:秒秒”，預設一開始顯示“分分:秒秒”。

/\*四位元七段顯示器,多工掃描,時鐘功能 \*/

#include <FlexiTimer2.h>

#include <Time.h>

int pushButton = 2,buttonState = 0,BeforeState = 0;

int delaytime = 1000;

boolean check=true;

const int seg7[]= { 11, 10,9,8,7,6,5};//七段控制腳陣列,對應a〜g段

const int scan[]= {13, 12, 4,3}; //掃描端控制腳陣列,千,百,十,個

char TAB[]={ 0x3F,0x06,0x5B,0x4F,0x66,0x6D,0x7D,0x27,0x7F,0x67,0};//七節顯示器編碼表0〜9

//int delaytime=1000;

//記錄掃描線位置的變數(中斷用)

int a,displayspeed=200;

volatile char scan\_line = 0;

int ii,ans=0;

// the setup routine runs once when you press reset:

void setup() {

pinMode(pushButton, INPUT);

for(ii = 0;ii < 7;ii++){

pinMode(seg7[ii],OUTPUT);

}

for(ii = 0;ii < 4;ii++){

pinMode(scan[ii],OUTPUT);

digitalWrite(scan[ii],LOW);

}

Serial.begin(9600);

FlexiTimer2::set(1000, flash); //每1000ms呼叫一次 flash

FlexiTimer2::start(); //啟動計時中斷

}

// the loop routine runs over and over again forever:

void loop()

{

buttonState = digitalRead(pushButton);

if(buttonState==1)

{

if(buttonState!=BeforeState) //debounce

delay(50);

if(buttonState==1 and BeforeState==0)//Work

{

check = !check;

}

}

BeforeState=buttonState;

if(check==false)

{

int num0 = (ans/3600)/10;

int num1 = (ans/3600)%10;

int num2 = ((ans%3600)/60)/10;

int num3 = ((ans%3600)/60)%10;

OutPort(TAB[num0]);

digitalWrite(scan[0] , LOW);

delay(1);

digitalWrite(scan[0] , HIGH);

OutPort(TAB[num1]);

digitalWrite(scan[1] , LOW);

delay(1);

digitalWrite(scan[1] , HIGH);

OutPort(TAB[num2]);

digitalWrite(scan[2] , LOW);

delay(1);

digitalWrite(scan[2] , HIGH);

OutPort(TAB[num3]);

digitalWrite(scan[3] , LOW);

delay(1);

digitalWrite(scan[3] , HIGH);

}

else if(check==true)

{

int num0 = ((ans%3600)/60)/10;

int num1 = ((ans%3600)/60)%10;

int num2 = (ans%60)/10;

int num3 = (ans%60)%10;

OutPort(TAB[num0]);

digitalWrite(scan[0] , LOW);

delay(1);

digitalWrite(scan[0] , HIGH);

OutPort(TAB[num1]);

digitalWrite(scan[1] , LOW);

delay(1);

digitalWrite(scan[1] , HIGH);

OutPort(TAB[num2]);

digitalWrite(scan[2] , LOW);

delay(1);

digitalWrite(scan[2] , HIGH);

OutPort(TAB[num3]);

digitalWrite(scan[3] , LOW);

delay(1);

digitalWrite(scan[3] , HIGH);

}

}

//計時中斷程式,每次執行時處理1位數

void flash(){

ans++;

Serial.println(ans);

}

void OutPort(byte dat){

for( int jj = 0;jj < 7;jj++){

if(dat % 2 == 1)

digitalWrite(seg7[jj],HIGH);

else

digitalWrite(seg7[jj],LOW);

dat = dat / 2;

}

}