實驗十一 倒數計時器與喇叭控制

實驗目的： Arduino UNO與計時器、按鍵、喇叭發音，達成計時器之應用

實驗步驟：

1. 先將Arduino連接一個四合一七節顯示器、一個喇叭和四個按鍵開關。
2. 使用四合一七節顯示顯示器來顯示現在時刻顯示格式為"分分:秒秒"

程式執行後顯示器顯示"00:00"，

按下操作鍵 K1～K4 動作如下:

開關K1 : 進入設定現在時刻，計時器不動作

開關K2 : 設定分鐘 (按一下加一)

開關K3 : 設定秒數 (按一下加一)

開關K4 : 完成設定，開始倒數計時

當時間到零時後，喇叭會發出聲響10秒鐘提醒

const int seg7[] = {13, 12, 11, 10, 9, 8, 7};

const int scan[] = {5, 4, 3, 2};

int delaytime = 5;

char TAB[] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x27, 0x7F, 0x67, 0x00};

int ii, jj, ScanLine = 0, MODE = 0, k = 0, s = 0, m = 0;

const int buttonPin = A0;

const int buttonPin1 = A1;

const int buttonPin2 = A2;

const int buttonPin3 = A3;

boolean buttonState;

int C, D, E, F;

const byte BuzzerPin = 6;

void setup() {

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

pinMode(seg7[ii], OUTPUT);

}

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

pinMode(scan[ii], OUTPUT);

digitalWrite(scan[ii], HIGH);

}

pinMode(BuzzerPin, OUTPUT);

Serial.begin(9600);

}

void loop() {

buttonState = digitalRead(buttonPin);

if (buttonState == LOW) {

delay(20);

while (1) {

buttonState = digitalRead(buttonPin);

if (buttonState == HIGH) {

MODE = 1;

m = 0;

s = 0;

break;

}

}

delay(20);

}

buttonState = digitalRead(buttonPin1);

if (buttonState == LOW) {

delay(20);

while (1) {

buttonState = digitalRead(buttonPin1);

if (buttonState == HIGH) {

if (MODE == 1)

m++;

break;

}

}

delay(20);

}

buttonState = digitalRead(buttonPin2);

if (buttonState == LOW) {

delay(20);

while (1) {

buttonState = digitalRead(buttonPin2);

if (buttonState == HIGH) {

if (MODE == 1)

s++;

break;

}

}

delay(20);

}

buttonState = digitalRead(buttonPin3);

if (buttonState == LOW) {

delay(20);

while (1) {

buttonState = digitalRead(buttonPin3);

if (buttonState == HIGH) {

if (MODE == 1)

MODE = 2;

break;

}

}

delay(20);

}

C = m / 10;

D = m % 10;

E = s / 10;

F = s % 10;

if (MODE == 2 && m == 0 && s == 0)

{

tone(BuzzerPin, 400, 10000);

MODE = 0;

}

OutPort(TAB[F]);

digitalWrite(scan[0],HIGH );

delay(delaytime);

digitalWrite(scan[0],LOW );

OutPort(TAB[E]);

digitalWrite(scan[1],HIGH );

delay(delaytime);

digitalWrite(scan[1],LOW );

OutPort(TAB[D]);

digitalWrite(scan[2],HIGH);

delay(delaytime);

digitalWrite(scan[2], LOW );

OutPort(TAB[C]);

digitalWrite(scan[3], HIGH);

delay(delaytime);

digitalWrite(scan[3], LOW);

if (MODE == 2) {

k++;

if (k == 50) {

k = 0;

s--;

if (s <= 0 && m != 0) {

s = 0;

m--;

s = 59;

}

}

}

}

void OutPort(byte dat) {

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

if (dat % 2 == 1)

digitalWrite(seg7[jj], LOW);

else

digitalWrite(seg7[jj], HIGH);

dat = dat / 2;

}

}