#include <LiquidCrystal.h>

#include <stdio.h>

#include <Wire.h>

#include <RTClib.h>

/////////////////////////////

// RTC初始化 //

RTC\_DS1307 rtc;

////////////////////////////

// 端口LCD //

const int rs = 12, en = 11, d4 = 5, d5 = 4, d6 = 3, d7 = 2;

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

int timeWidth = 0;

int dataOut = 0;

int lostData = 0;

int n = 0;

///////////////////////////////////

// 解码后时间变量 //

int P0 = 0;

int P1 = 0;

int P2 = 0;

int P3 = 2;

int P4 = 0;

int hour\_ = 0;

int minute\_ = 0;

int second\_ = 0;

int week\_ = 0;

int day\_ = 0;

int month\_ = 0;

int year\_ = 0;

//////////////////////////////////////

// 显示和setup()时间变量 //

// p0~4 没有用除p3

int P0R = 0;

int P1R = 0;

int P2R = 0;

int P3R = 0;

int P4R = 0;

int hour\_R = 9;

int minute\_R = 10;

int second\_R = 0;

int week\_R = 5;

int day\_R = 15;

int month\_R = 6;

int year\_R = 2018;

int bpcarray[19] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};

int bpcarrayT[19] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0}; //校验后正确的存在这里

int getrightbpc = 0;

bool p3ture1, p3ture2, p4ture1, p4ture2;

int led = 53;

int validbpc = 0;

int changed = 0;

////////////////////////////////////

// 打印LCD上 //

void printrtc() {

DateTime now = rtc.now();

lcd.clear();

////从第1行开始

lcd.setCursor(0, 0);

lcd.print(now.year(), DEC);

lcd.print("/");

lcd.print(now.month(), DEC);

lcd.print("/");

lcd.print(now.day(), DEC);

lcd.print("/");

// lcd.print("week");

switch (week\_R) {

case 1: lcd.print("Mon"); break;

case 2: lcd.print("Tue"); break;

case 3: lcd.print("Wed"); break;

case 4: lcd.print("Thu"); break;

case 5: lcd.print("Fri"); break;

case 6: lcd.print("Sta"); break;

case 7: lcd.print("Sun"); break;

default: lcd.print("Mon");

}

// lcd.print(week);

//lcd.print("/");

// lcd.print((millis()/1000)%10);

////从第2行开始

lcd.setCursor(0, 1);

lcd.print(now.hour(), DEC);

lcd.print(":");

lcd.print(now.minute(), DEC);

lcd.print(":");

lcd.print(now.second(), DEC);

if (P3R > 1) {

lcd.print("/PM");

}

else {

lcd.print("/AM");

}

}

/////////////////////////////////

// 接收BPC //

void receivebpc() {

int value = analogRead(A0);

if (value < 100) {

timeWidth++;

lostData = 0;

}

else {

if (timeWidth != 0) {

dataOut = timeWidth - 1;

bpcarray[n] = dataOut;

n++;

}

timeWidth = 0;

bpcarray[18] = dataOut;

lostData++;

}

//decoding();

//rtctotime();

// printTime();

}

////////////////////////////////

// 解码 //

void decoding(int bpc[]) {

P1 = bpc[0];

P2 = bpc[1];

P3 = bpc[9]; //P3>1 PM

P4 = bpc[18];

//秒 分钟

if (bpc[0] \* 20 + 20 == 60) {

second\_ = 0;

minute\_ = bpc[4] \* 16 + bpc[5] \* 4 + bpc[6] + 1;

}

else {

second\_ = bpc[0] \* 20 + 20;

minute\_ = bpc[4] \* 16 + bpc[5] \* 4 + bpc[6];

}

//小时

if (minute\_ == 60) {

hour\_ = bpc[2] \* 4 + bpc[3];

minute\_ = 0;

}

else {

hour\_ = bpc[2] \* 4 + bpc[3];

}

if (hour\_ == 0) {

hour\_ = 12;

}

week\_ = bpc[7] \* 4 + bpc[8]; //星期

day\_ = bpc[10] \* 16 + bpc[11] \* 4 + bpc[12]; //天

month\_ = bpc[13] \* 4 + bpc[14]; //月

year\_ = 2000 + bpc[15] \* 16 + bpc[16] \* 4 + bpc[17]; //年

}

///////////////////////////////////

// 校验 //

int varify() {

int p3ji = 0;

int p4ji = 0;

int index;

if (bpcarray[1] == 0) {

// “P1”、“P2”、“时”、“分”、“星期 奇偶统计

for (index = 0; index < 9; index++) {

if (bpcarray[index] == 1 || bpcarray[index] == 2) {

p3ji++;

}

}

//“日”、“月”、“年” 奇偶统计

for (index = 10; index < 18; index++) {

if (bpcarray[index] == 1 || bpcarray[index] == 2) {

p4ji++;

}

}

p3ture1 = ((p3ji % 2 == 0) && ((bpcarray[9] == 0) || (bpcarray[9] == 2)));

p3ture2 = ((p3ji % 2 != 0) && ((bpcarray[9] == 1) || (bpcarray[9] == 3)));

p4ture1 = ((p4ji % 2 == 0) && ((bpcarray[18] == 0) || (bpcarray[18] == 2)));

p4ture2 = ((p4ji % 2 != 0) && ((bpcarray[18] == 1) || (bpcarray[18] == 3)));

//

if ((p3ture1 || p3ture2) && (p4ture1 || p4ture2) ) {

return 1;

}

else {

return 0;

}

}

else {

//bpcarray[1](P0)!=0

// lcd.clear();

Serial.println("p2!=0");

}

}

////////////////////////////////

// 终端打印 bpc //

void testprintbpc() {

int i;

for (i = 0; i < 19; i++) {

Serial.print(bpcarray[i]);

}

Serial.println("");

}

///////////////////////////////////

// 传递解码后参数 //

void transferT(int yearT, int monthT, int dayT, int weekT, int hourT, int minuteT, int secondT, int P0T, int P1T, int P2T, int P3T, int P4T) {

year\_R = yearT;

month\_R = monthT;

day\_R = dayT;

week\_R = weekT;

hour\_R = hourT;

minute\_R = minuteT;

second\_R = secondT;

P0R = P0T;

P1R = P1T;

P2R = P2T;

P3R = P3T;

P4R = P4T;

}

void setup() {

while (!Serial);

Serial.begin(9600);

pinMode(led, OUTPUT);

lcd.begin(16, 2); //设置LCD数目

// put your setup code here, to run once:

if (! rtc.begin()) {

Serial.println("Couldn't find RTC");

while (1);

}

else {

Serial.println("Find RTC!");

}

if (! rtc.isrunning()) {

Serial.println("RTC is NOT running!");

// following line sets the RTC to the date & time this sketch was compiled

// rtc.adjust(DateTime(F(\_\_DATE\_\_), F(\_\_TIME\_\_)));

// This line sets the RTC with an explicit date & time, for example to set

// January 21, 2014 at 3am you would call:

rtc.adjust(DateTime(year\_R, month\_R, day\_R, hour\_R, minute\_R, second\_R));

}

else {

/////////////////////////////////////////////////////////////////////

// RTC写入 //

/////////////////////////////////////////////////////////////////////

rtc.adjust(DateTime(year\_R, month\_R, day\_R, hour\_R, minute\_R, second\_R));

/////////////////////////////////////////////////////////////////////

Serial.println("写入成功");

}

}

void loop() {

// put your main code here, to run repeatedly:

Serial.println("初始settime");

// delay(1000);

int t, j, k, l; //k为5分钟

for (k = 0; k < 5; k++) {

for (t = 0; t < 60; t++) {

for (j = 0; j < 10; j++) {

receivebpc();

if (lostData > 12) {

//测试打印bpc

Serial.println("接收到的码");

//testprintbpc();

if (bpcarray[17] != 0) {

//validbpc = 1;

validbpc++;

}

else {

validbpc = 0;

}

////////////////////////

// 校验后传送数组

if (validbpc > 1) {

if (varify()) {

getrightbpc = 1;//标志位

for (l = 0; l < 19; l++) {

bpcarrayT[l] = bpcarray[l];

}

}//if(varify())

}//if (getrightbpc == 0)

n = 0; //数组坐标初始化

lostData = 0; //高电平初始化

}//if (lostData>12)

/////////////////////////////////

// 偷懒蓝灯 //

if (validbpc >= 1) {

if (getrightbpc == 1) {

digitalWrite(led, HIGH);

delay(100);

}//if(getrightbpc==1)

else {

//getrightbpc==0

digitalWrite(led, HIGH);

delay(50);

digitalWrite(led, LOW);

delay(50);

}

}//if(validbpc==1)

else {

//validbpc==0

digitalWrite(led, LOW);

delay(100);

}

}//for (j = 0;j<10; j++)

if (changed == 0) {

if (getrightbpc == 1) {

decoding(bpcarrayT);

transferT(year\_, month\_, day\_, week\_, hour\_, minute\_, second\_, P0, P1, P2, P3, P4);

setup();

changed = 1;

}

}

// 获取rtc时钟模块 时间并打印

printrtc();

}//for (t = 0;t<60;t++)

}// for (k=0;k<5;k++)

changed = 0;

}