#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 tang = 1;

int head = 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;

}

else {

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, p3ou = 0;

int p4ji = 0, p4ou = 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] == 0 && bpcarray[index] == 3) {

p3ou++;

}

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

p3ji++;

}

}

*//“日”、“月”、“年” 奇偶统计*

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

if (bpcarray[index] == 0 && bpcarray[index] == 3) {

p4ou++;

}

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 = (p3ji % 2 == 0) && ((bpcarray[18] == 0) || (bpcarray[18] == 2));

p4ture2 = (p3ji % 2 != 0) && ((bpcarray[18] == 0) || (bpcarray[18] == 2));

*// Serial.println(p3ture1);*

*// Serial.println(p3ture2);*

*// Serial.println(p4ture1);*

*// Serial.println(p4ture2);*

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

*// Serial.println("校验成功");*

return 1;

}

else {

*// Serial.println("p2=0,p3 p4 error");*

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**("");

}

*//////////////////////////////////*

*// 终端打印 时间 //*

*///////////////////////////////////*

*// 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;

}

*////////////////////////////////*

*// setup() //*

void **testprinttime**(int yearT, int monthT, int dayT, int weekT, int hourT, int minuteT, int secondT) {

Serial.**print**(yearT);

Serial.**print**("/");

Serial.**print**(monthT);

Serial.**print**("/");

Serial.**print**(dayT);

Serial.**print**("/");

Serial.**print**(weekT);

Serial.**print**("//");

Serial.**print**(hourT);

Serial.**print**("/");

Serial.**print**(minuteT);

Serial.**print**("/");

Serial.**print**(secondT);

Serial.**print**("/");

Serial.**println**("");

}

*/////////////////////////////////*

*// 偷懒蓝灯 //*

void **blueled**(int t) {

if ( t < 1) {

**digitalWrite**(led, HIGH);

**delay**(50);

**digitalWrite**(led, LOW);

**delay**(50);

}

else {

**digitalWrite**(led, HIGH);

**delay**(100);

}

}

*////////////////////////////////*

*// setup() //*

void **setup**() {

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

while (!Serial);

Serial.**begin**(9600);

**pinMode**(led, OUTPUT);

lcd.**begin**(16, 2); *//设置LCD数目*

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");*

int i, j, k, l; *//k为5分钟*

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

*// i控制分钟*

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

*// j控制1秒*

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

*// k控制0.1秒*

**receivebpc**();

if (lostData > 12) {

Serial.**println**("接收到的码");

*//testprintbpc();*

head++;

validbpc = 1;

if (getrightbpc == 0 && head < 2) {

if (**varify**()) {

getrightbpc = 1; *//校验标志位1*

*// 传输保存bpc*

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

bpcarrayT[1] = bpcarray[1];

}

}

}*//if (getrightbpc ==0)*

n = 0; *//数组坐标初始化*

lostData = 0; *//高电平初始化*

}*// if(lostData>12)*

if (validbpc == 1) {

*// Serial.println("bpc帧头");*

*// blue有效bpc*

if (getrightbpc == 1) {

*//getrightbpc == 0*

**digitalWrite**(led, HIGH);

**delay**(100);

}*// if (getrightbpc==0)*

else {

*//getrightbpc == 1*

*// 通过校验*

**digitalWrite**(led, HIGH);

**delay**(50);

**digitalWrite**(led, LOW);

**delay**(50);

}

}*//if(validbpc==1)*

else {

*// validbpc==0*

**digitalWrite**(led, LOW);

**delay**(100);

}*//if(blue==1) else*

}*//for (k=0;k<10;k++) 0.1s*

*// 获取rtc时钟模块 时间并打印*

**printrtc**();

if (tang == 1) {

if (getrightbpc == 1) {

Serial.**println**("校验通过并打印");

**decoding**(bpcarrayT);

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

**setup**();

tang = 0;

}

}

}*//for (j=0;j<60;j++) 1s*

}*//for (i=0;i<5;i++) 1min*

}