// Date and time functions using a DS1307 RTC connected via I2C and Wire lib

#include <Wire.h>

#include "RTClib.h"

RTC\_DS1307 rtc;

unsigned long timer;

unsigned long pumpTimeOn = 60000; //1 min in milliseconds

unsigned long pumpTimeOff = 900000; //15 min in milliseconds

boolean pumpState = 1; //1 = pump on, 0 = pump off

int pumpPin = 7;// pin that turns the pump on and off

void setup () {

 Serial.begin(57600);

#ifdef AVR

 Wire.begin();

#else

 Wire1.begin(); // Shield I2C pins connect to alt I2C bus on Arduino Due

#endif

 rtc.begin();

 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(2014,12,16,12,52,0));

 // 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(2014, 1, 21, 3, 0, 0));

 }

 //set pump pin to output

 pinMode(pumpPin, OUTPUT);

 //initalize timer

 timer = millis(); //set the timer to the current millis count

}

void loop () {

 if(pumpState == 1){

 digitalWrite(pumpPin, HIGH);

 unsigned long currentMillis = millis();//read the current millis count

 if(currentMillis >= (timer + pumpTimeOn)){//if the current millis is greater than the timer and the pump on limit... then

 pumpState = 0;//change the pumpState to off

 Serial.println("the pump is now off at this time:");

 printCurrentTime();

 timer = millis(); //reset timer

 }

 }

 if(pumpState == 0){

 digitalWrite(pumpPin, LOW);

 unsigned long currentMillis = millis();//read the current millis count

 if(currentMillis >= (timer + pumpTimeOff)){//if the current millis is greater than the timer and the pump off limit... then

 pumpState = 1;//change the pumpState to on

 Serial.println("the pump is now on at this time:");

 printCurrentTime();

 timer = millis(); //reset timer

 }

 }

 //delay(3000);

}

void printCurrentTime(){

 DateTime now = rtc.now();

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

 Serial.print('/');

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

 Serial.print('/');

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

 Serial.print(' ');

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

 Serial.print(':');

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

 Serial.print(':');

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

 Serial.println();

 Serial.print(" since midnight 1/1/1970 = ");

 Serial.print(now.unixtime());

 Serial.print("s = ");

 Serial.print(now.unixtime() / 86400L);

 Serial.println("d");

 // calculate a date which is 7 days and 30 seconds into the future

 DateTime future (now.unixtime() + 7 \* 86400L + 30);

 Serial.print(" now ");

 Serial.print(future.year(), DEC);

 Serial.print('/');

 Serial.print(future.month(), DEC);

 Serial.print('/');

 Serial.print(future.day(), DEC);

 Serial.print(' ');

 Serial.print(future.hour(), DEC);

 Serial.print(':');

 Serial.print(future.minute(), DEC);

 Serial.print(':');

 Serial.print(future.second(), DEC);

 Serial.println();

 Serial.println();

}