

Project Report

ARDUINO DIGITAL CLOCK WITH DS1307 RTC

Operating System

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PROJECT SUMMARY:

We are going to make a digital real time clock with Arduino UNO using DS3231 RTC (Real Time Clock). The big question arrives here is that why we are making this project, what's the purpose of this project as Arduino itself has its' own clock?

So, the basic reason for making this project is that we will display real time (current time) on LCD whereas Arduino clock does not have this feature it will only show the time when it would be connected or when it would get the power once the Arduino is disconnected the clock will be stopped and will starts from the beginning once it would get the power whereas in our project the RTC will always keep the track of time weather it is disconnected or reprogrammed.

This is only possible with DS3231 or DS1307 RTC as this is highly accurate RTC which can maintain hours, minutes and seconds as well as date month and year, it is operated on 3.3 volts to 5 volts which makes it comfortable to work on many platforms. Further we can do improvement in this project that we will add alarm clock with buzzer so that it could perform both the tasks and for further enhancement we would be adding push buttons to set time or alarm.

PROJECT COMPONENTS:

1. DS3231
2. LCD 16x2
3. Arduino UNO
4. Push Buttons
5. Vero Board
6. Buzzer
7. Jumper wires
8. Resistors

PROJECT CODE:

```
#include <Wire.h>
#include <RTClib.h>
#include <LiquidCrystal.h>
RTC_DS1307 rtc;
#define mod 7
#define inc 8
#define dec 9
const int rs = 12, en = 11, d4 = 5, d5 = 4, d6 = 3, d7 = 2;
LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
int hourset=0;
int minset=0;
int dateset=0;
int monthset=0;
int thishour,thismin,thisdate,thismonth;
int secset = 0;

void setup()
{
  pinMode(12,OUTPUT);
  lcd.begin(16, 2);
  pinMode(mod,INPUT);
  pinMode(inc,INPUT);
  pinMode(dec,INPUT);
  Serial.begin(9600);
  delay(1000);
  if (! rtc.begin())
  {
    Serial.println("Couldn't find RTC");
    while (1);
  }
  if (!rtc.isrunning())
  {
    Serial.println("RTC lost power, lets set the time!");
  }
  DateTime now = rtc.now();
  delay(1000);
  hourset = (now.hour());
  minset = (now.minute());
  monthset = 1;
  dateset = (now.day());
}

void loop()
{
```

```

DateTime now = rtc.now();
thishour = now.hour();
thismin = now.minute();
thisdate = now.day();
thismonth = now.month();
lcd.setCursor(0,0);
lcd.print("Time: ");
lcd.print(now.hour(), DEC);
lcd.print(':');
lcd.print(now.minute(), DEC);
lcd.print(':');
lcd.print(now.second(), DEC);
lcd.setCursor(0,1);
lcd.print("Date: ");
lcd.print(now.day(), DEC);
lcd.print('/');
lcd.print(now.month(), DEC);
lcd.print('/');
lcd.print(now.year(), DEC);
if(thishour == hourset && thismin == minset && thisdate == dateset && thismonth ==
monthset )
{
    digitalWrite(12,HIGH);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("***** ALARM *****");
    delay(200);
    lcd.clear();
    lcd.setCursor(0,1);
    lcd.print("***** ALARM *****");
    delay(200);
    lcd.clear();
}
else
{
    digitalWrite(12,LOW);
}
if(digitalRead(inc))
{
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print(" ***Alarm Set:***");
    lcd.setCursor(0,1);
    lcd.print(hourset);
    lcd.print(":");
    lcd.print(minset);

```

```

    lcd.print(" | ");
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(monthset);
    lcd.print("/");
    lcd.print("22");
    delay(4000);
    lcd.clear();
}
if(digitalRead(mod))
{
    delay(500);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Time:");
    lcd.setCursor(0,1);
    lcd.print(hourset);
    lcd.print(":");
    lcd.print(minset);
    while(true)
    {
        lcd.clear();
        lcd.setCursor(0,0);
        lcd.print("Set Time:");
        lcd.setCursor(0,1);
        lcd.print(hourset);
        lcd.print(":");
        lcd.print(minset);
        delay(200);
        lcd.clear();
        lcd.setCursor(0,0);
        lcd.print("Set Time:");
        lcd.setCursor(0,1);
        lcd.print(" ");
        lcd.print(":");
        lcd.print(minset);
        delay(200);
        if(digitalRead(inc) == HIGH)
        {
            delay(500);
            hourset++;
            if(hourset>23)
            {
                hourset=23;
            }
        }
        else

```

```

    {
        hourset=hourset;
    }
}
if(digitalRead(dec) == HIGH)
{
    delay(500);
    hourset--;
    if(hourset<0)
    {
        hourset=0;
    }
    else
    {
        hourset=hourset;
    }
}
if(digitalRead(mod) == HIGH)
{
    delay(1000);
    lcd.clear();
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Time:");
    lcd.setCursor(0,1);
    lcd.print(hourset);
    lcd.print(":");
    lcd.print(minset);
    delay(10);
    break;
}

}
while(true)
{
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Time:");
    lcd.setCursor(0,1);
    lcd.print(hourset);
    lcd.print(":");
    lcd.print(minset);
    delay(200);
    lcd.clear();
    lcd.setCursor(0,0);

```



```

lcd.print("Set Time:");
lcd.setCursor(0,1);
lcd.print(hourset);
lcd.print(":");
lcd.print(" ");
delay(200);
if(digitalRead(inc) == HIGH)
{
    delay(500);
    minset++;
    if(minset>59)
    {
        minset=59;
    }
    else
    {
        minset=minset;
    }
}
if(digitalRead(dec) == HIGH)
{
    delay(500);
    minset--;
    if(minset<0)
    {
        minset=0;
    }
    else
    {
        minset=minset;
    }
}
if(digitalRead(mod) == HIGH)
{
    delay(1000);
    lcd.clear();
    lcd.print("Time Set");
    delay(2000);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(monthset);
    delay(10);
}

```



```

        break;
    }
}
while(true)
{
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(monthset);
    delay(200);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(" ");
    lcd.print("/");
    lcd.print(monthset);
    delay(200);
    if(digitalRead(inc) == HIGH)
    {
        delay(500);
        dateset++;
        if(dateset>31)
        {
            dateset=31;
        }
        else
        {
            dateset=dateset;
        }
    }
    if(digitalRead(dec) == HIGH)
    {
        delay(500);
        dateset--;
        if(dateset<1)
        {
            dateset=1;
        }
        else
        {
            dateset=dateset;
        }
    }
}

```

```
}
if(digitalRead(mod) == HIGH)
{
    delay(1000);
    lcd.clear();
    delay(1000);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(monthset);
    delay(10);
    break;
}
}
while(true)
{
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(monthset);
    delay(200);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Set Date:");
    lcd.setCursor(0,1);
    lcd.print(dateset);
    lcd.print("/");
    lcd.print(" ");
    delay(200);
    if(digitalRead(inc) == HIGH)
    {
        delay(500);
        monthset++;
        if(monthset>12)
        {
            monthset=12;
        }
        else
        {
            monthset=monthset;
        }
    }
}
```

```
if(digitalRead(dec) == HIGH)
{
    delay(500);
    monthset--;
    if(monthset<1)
    {
        monthset=1;
    }
    else
    {
        monthset=monthset;
    }
}
if(digitalRead(mod) == HIGH)
{
    delay(1000);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("***Alarm Set***");
    delay(2000);
    delay(10);
    lcd.clear();
    delay(10);
    break;
}
}
}
```

PROJECT VIDEO LINK:

CIRCUIT EXPLANATION:

<https://drive.google.com/file/d/1O7dAkY0vNAS08GJct74BUgQmKiUDrTeB/view?usp=sharing>

CODE EXPLANATION:

https://drive.google.com/file/d/1LUkZzqTfl3bjnqM7xYICz3aE_f9pDivt/view?usp=sharing