REAL TIME CLOCK

PROJECT DESCRIPTION

This project is a Real-Time Clock (RTC) based digital clock and calendar system using an Arduino Uno, DS3231 RTC module, and a 16×2 I2C LCD. The DS3231 RTC provides highly accurate time and date even during power failure due to its built-in backup battery. The Arduino reads the current time and date from the RTC module and displays it on the LCD in HH:MM:SS and DD/MM/YYYY format. This system is suitable for digital clocks, attendance systems, data loggers, and automation projects.

PIN CONNECTIONS
### DS3231 RTC Module ↔ Arduino UNO
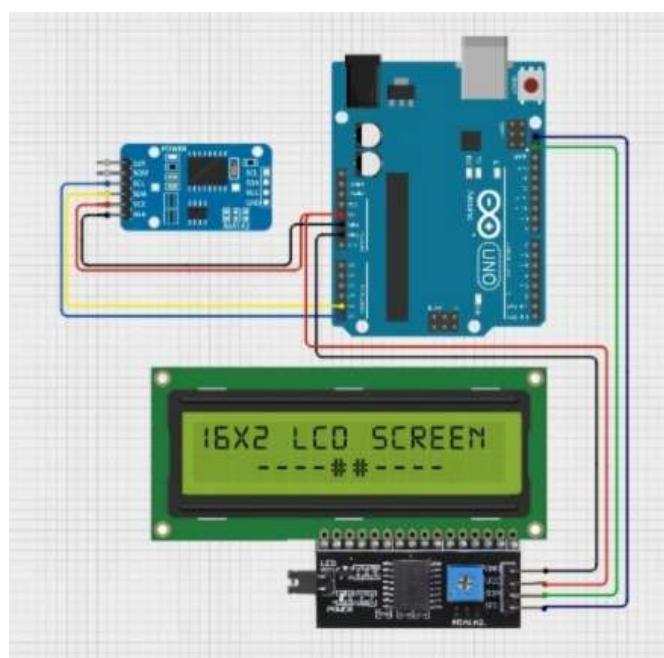
RTC Pin	Arduino Pin
VCC	5V
GND	GND
SDA	A4
SCL	A5

16×2 LCD with I2C Module ↔ Arduino UNO
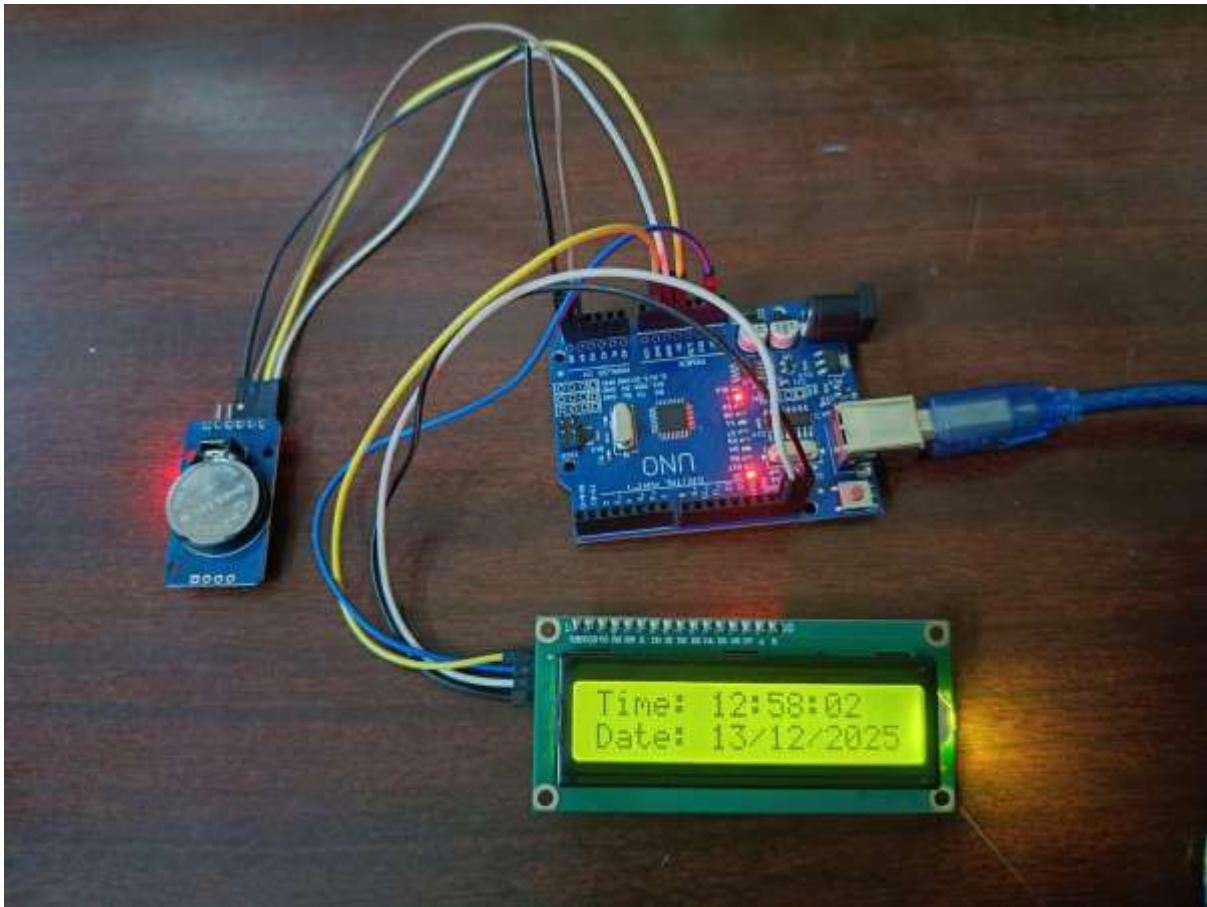
LCD Pin	Arduino Pin
VCC	5V
GND	GND
SDA	A4
SCL	A5

CIRCUIT DIAGRAM

PROJECT PHOTO

CODE

```cpp
#include <Wire.h>
#include <RTClib.h>
#include <LiquidCrystal_I2C.h>

RTC_DS3231 rtc;
LiquidCrystal_I2C lcd(0x27, 16, 2); // Change address if needed

void setup() {
  Wire.begin();
  lcd.init();
  lcd.backlight();

  if (!rtc.begin()) {
    lcd.print("RTC not found");
    while (1);
  }

  // Uncomment ONLY ONCE to set current date & time
  rtc.adjust(DateTime(F(__DATE__), F(__TIME__)));
```

```
}

void loop() {
  DateTime now = rtc.now();

  lcd.clear();

  // Display Time
  lcd.setCursor(0, 0);
  lcd.print("Time: ");
  if (now.hour() < 10) lcd.print("0");
  lcd.print(now.hour());
  lcd.print(":");
  if (now.minute() < 10) lcd.print("0");
  lcd.print(now.minute());
  lcd.print(":");
  if (now.second() < 10) lcd.print("0");
  lcd.print(now.second());

  // Display Date
  lcd.setCursor(0, 1);
  lcd.print("Date: ");
  if (now.day() < 10) lcd.print("0");
  lcd.print(now.day());
  lcd.print("/");
  if (now.month() < 10) lcd.print("0");
  lcd.print(now.month());
  lcd.print("/");
  lcd.print(now.year());

  delay(1000);
}
```