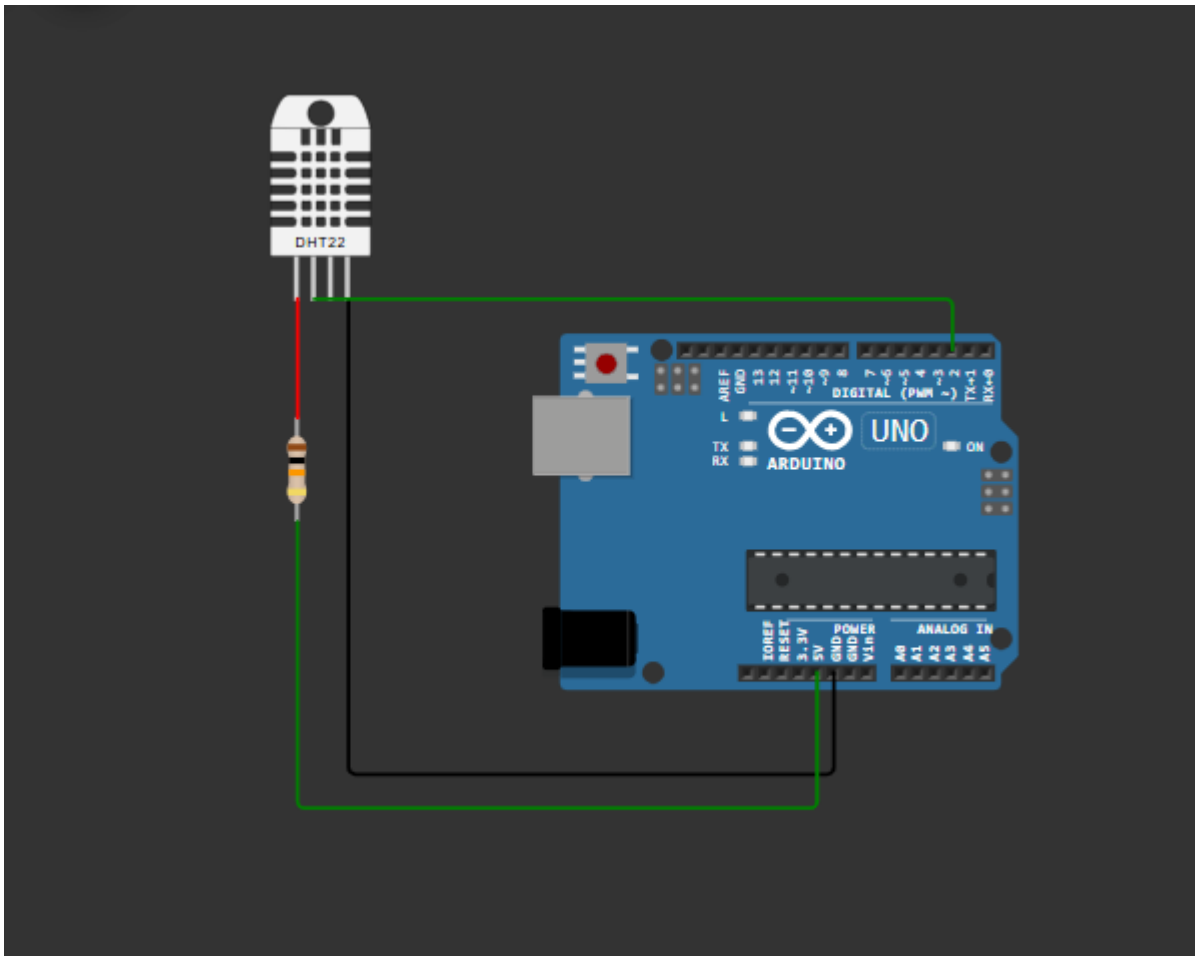
IOT HOLIDAY ASSIGNMENT 2211CS020515

1. **Weather Reporting System**:

```
#include <Adafruit_Sensor.h>
#include <DHT.h>
#include <DHT_U.h>

// Define DHT sensor pin and type
#define DHTPIN 2     // Pin where the DATA pin is connected
#define DHTTYPE DHT22 // DHT22 sensor type

// Initialize DHT sensor
DHT dht(2, DHT22);

void setup() {
  Serial.begin(9600);
  Serial.println("Weather Report System");

  // Initialize the DHT sensor
  dht.begin();
  Serial.println("DHT22 sensor initialized");
}

void loop() {
  // Read temperature and humidity from DHT22
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();
```

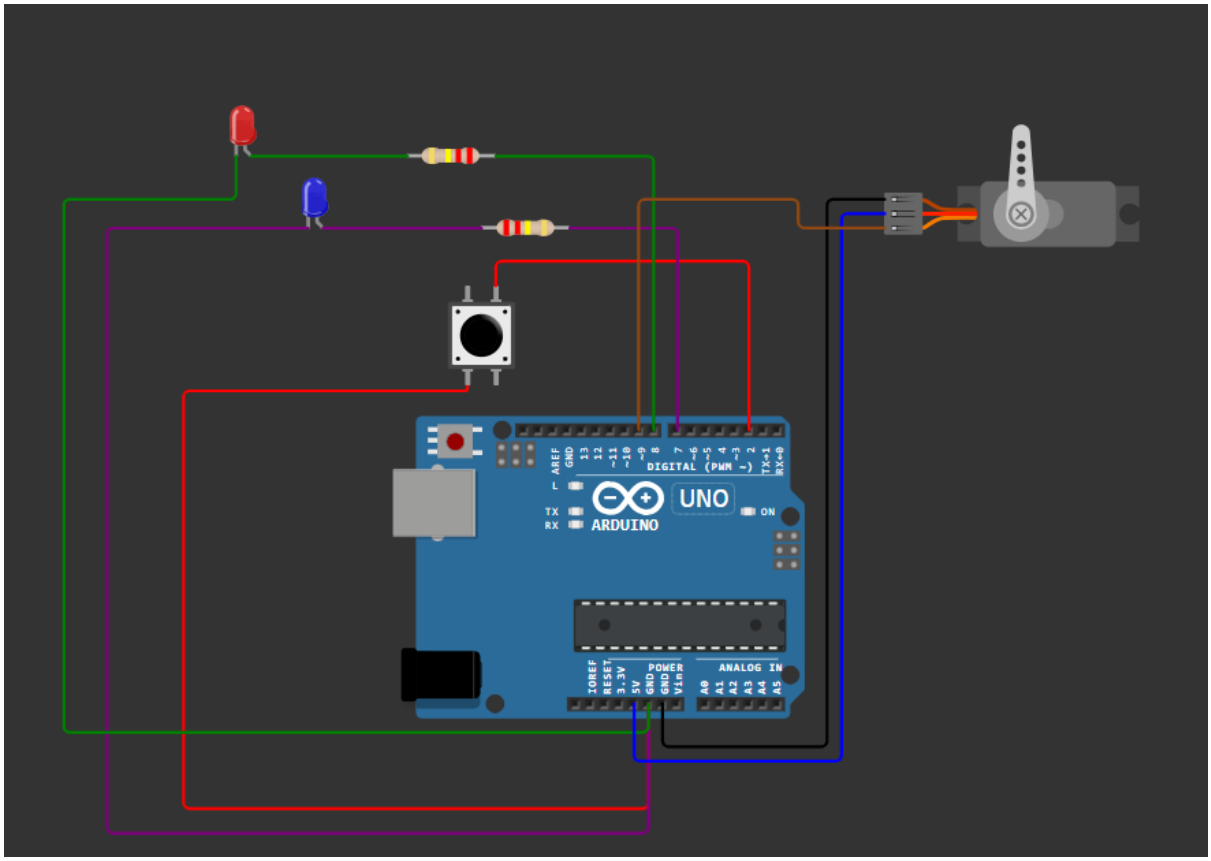
```
 // Check if readings are valid
 if (isnan(temperature) || isnan(humidity)) {
  Serial.println("Failed to read from DHT22 sensor!");
 } else {
  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println("°C");

  Serial.print("Humidity: ");
  Serial.print(humidity);
  Serial.println("%");
 }

 // Simulate pressure and altitude data (as BMP180 is unavailable)
 float pressure = 1013.25; // Sea level standard atmospheric pressure in hPa
 float altitude = 50.0;    // Simulated altitude in meters

 Serial.print("Pressure: ");
 Serial.print(pressure);
 Serial.println(" hPa");

 Serial.print("Altitude: ");
 Serial.print(altitude);
 Serial.println(" m");

 Serial.println("-------------------------");

 // Delay before the next reading
 delay(2000);
}
```



2. **Home Automation System**:

```
#include <Servo.h>

#define LIGHT1_PIN 7  // Pin for Light 1 (LED 1)
#define LIGHT2_PIN 8  // Pin for Light 2 (LED 2)
#define BUTTON_PIN 2  // Pin for the push button
#define FAN_SERVO_PIN 9  // Pin for the servo motor (Fan)

Servo fanServo;          // Servo object for fan simulation
bool fanRunning = false; // State of the fan (false = OFF, true = ON)
int currentAngle = 90;   // Current angle of the servo
int step = 1;            // Step size for continuous movement

void setup() {
  // Pin modes for LEDs
  pinMode(7, OUTPUT);
  pinMode(8, OUTPUT);

  // Pin mode for button with internal pull-up
  pinMode(2, INPUT_PULLUP);
```

```
22.
23.  // Attach the servo and set initial position
24.  fanServo.attach(9);
25.  fanServo.write(currentAngle); // Start fan at 90° (OFF position)
26.
27.  // Turn off LEDs initially
28.  digitalWrite(7, LOW);
29.  digitalWrite(8, LOW);
30.}
31.
32.void loop() {
33.  static bool buttonPressed = false;
34.
35.  // Check if the button is pressed and toggle the fan state
36.  if (digitalRead(2) == LOW && !buttonPressed) {
37.    fanRunning = !fanRunning; // Toggle fan and lights state
38.    buttonPressed = true;
39.
40.    // Toggle lights
41.    if (fanRunning) {
42.      digitalWrite(7, HIGH); // Turn Light 1 ON
43.      digitalWrite(8, HIGH); // Turn Light 2 ON
44.    } else {
45.      digitalWrite(LIGHT1_PIN, LOW);  // Turn Light 1 OFF
46.      digitalWrite(LIGHT2_PIN, LOW);  // Turn Light 2 OFF
47.      fanServo.write(90);            // Reset fan to 90° (OFF position)
48.    }
49.    delay(200); // Debounce delay
50.  } else if (digitalRead(BUTTON_PIN) == HIGH) {
51.    buttonPressed = false;
52.  }
53.
54.  // Move the servo continuously if the fan is ON
55.  if (fanRunning) {
56.    currentAngle += step;
57.
58.    // Reverse direction when reaching bounds
59.    if (currentAngle >= 180 || currentAngle <= 90) {
60.      step = -step;
61.    }
62.
63.    fanServo.write(currentAngle);
64.    delay(10); // Delay for smooth movement
65.  }
66.}
67.
```



Air Pollution Monitoring System:

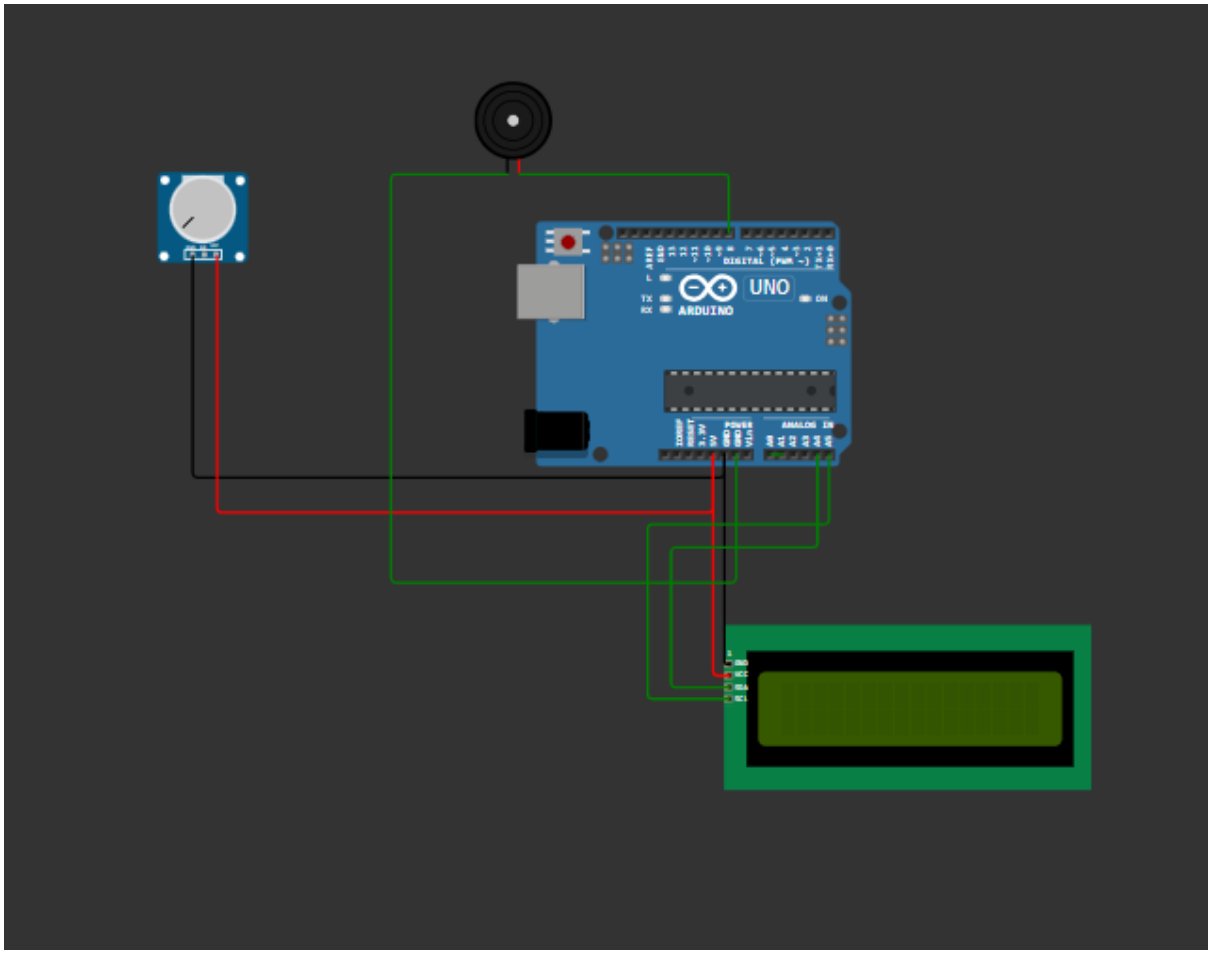
```
#include <Wire.h>

#include <LiquidCrystal_I2C.h>


// Define Pin Assignments

#define AIR_SENSOR_PIN A0  // Analog pin for Air Quality Sensor (use potentiometer for simulation)

#define BUZZER_PIN 8  // Pin for the Buzzer

#define LIGHT_PIN 9  // Pin for Light (LED)
```

```
// LCD I2C Setup (use address 0x27, but try 0x3F if not working)
LiquidCrystal_I2C lcd(0x27, 16, 2);  // Initialize LCD with I2C address 0x27 and 16 columns, 2 rows

// Thresholds for air quality levels
#define GOOD_AIR_QUALITY 700
#define POOR_AIR_QUALITY 300

void setup() {
  // Start Serial Communication
  Serial.begin(9600);

  // Initialize Buzzer and Light pins
  pinMode(8, OUTPUT);
  pinMode(9, OUTPUT);

  // Initialize the LCD
  lcd.begin(16, 2); // Initialize LCD with 16 columns, 2 rows
```

```
  delay(1000);  // Wait for 1 second for the LCD to initialize properly
  lcd.backlight();  // Turn on the LCD backlight
  lcd.setCursor(0, 0);  // Set cursor to the first column of the first row
  lcd.print("Air Quality Monitor");  // Display the title
  delay(2000);  // Wait for 2 seconds

  // Test if LCD is working by printing a test message
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Hello World");
  delay(2000);  // Wait for 2 seconds
}

void loop() {
  // Read the air quality sensor value (simulated by potentiometer)
  int airSensorValue = analogRead(A0);
```

```
  // Map the sensor value to a percentage (0-100% for display)
  float airQualityPercentage = map(airSensorValue, 0, 1023, 0, 100);

  // Display the air quality on the LCD
  lcd.clear();  // Clear the screen
  lcd.setCursor(0, 0);  // Set cursor to the first column of the first row
  lcd.print("Air Quality: ");
  lcd.print(airQualityPercentage);
  lcd.print("%");

  // Buzzer and Light activation based on air quality
  if (airSensorValue > 700) {
    digitalWrite(8, LOW);  // Turn off Buzzer
    digitalWrite(9, HIGH);  // Turn on Light (Good air quality)
  } else if (airSensorValue < 300) {
    digitalWrite(8, HIGH);  // Turn on Buzzer
```

```
    digitalWrite(9, LOW);   // Turn off Light (Poor air quality)
  } else {
    digitalWrite(8, LOW);  // Turn off Buzzer
    digitalWrite(9, LOW);   // Turn off Light (Moderate air quality)
  }

  // Delay for a short time
  delay(500);
}
```



Smart Irrigation System:

```
#include "RTClib.h"
#include "DHT.h"

#define DHTPIN 8
#define DHTTYPE DHT22
```

```
DHT dht(DHTPIN, DHTTYPE);


#include <LiquidCrystal_I2C.h>
#define I2C_ADDR    0x27
#define LCD_COLUMNS 20
#define LCD_LINES   4


LiquidCrystal_I2C lcd(I2C_ADDR, LCD_COLUMNS,
LCD_LINES);
String data;
int relay1=3;
int relay2=4;
int relay3=5;
int relay4=6;
RTC_DS1307 rtc;
char daysOfTheWeek[7][12] = {"Sunday", "Monday",
"Tuesday", "Wednesday", "Thursday", "Friday",
"Saturday"};
void setup()
  { {
 Serial.begin(115200);
```

```
  Serial.println(F("DHT22 example!"));


  dht.begin();
    }
{
  Serial.begin(115200);
   lcd.init();
  lcd.backlight();
  lcd.setCursor(3,0);
  lcd.print("welcome to");
  lcd.setCursor(2,1);
  lcd.print("SMART FARMING");
  delay(4000);
  pinMode(relay1, OUTPUT);
  pinMode(relay2, OUTPUT);
  pinMode(relay3, OUTPUT);
  pinMode(relay4, OUTPUT);
  Serial.println("welcome to my project");
  delay(500);
  if (! rtc.begin()) {
```

```
    Serial.println("Couldn't find RTC");
    Serial.flush();
    abort();
  }
  lcd.clear();

}
   }


void loop () {
   {
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();

  // Check if any reads failed and exit early (to try
again).
  if (isnan(temperature) || isnan(humidity)) {
    Serial.println(F("Failed to read from DHT sensor!"));
    return;
```

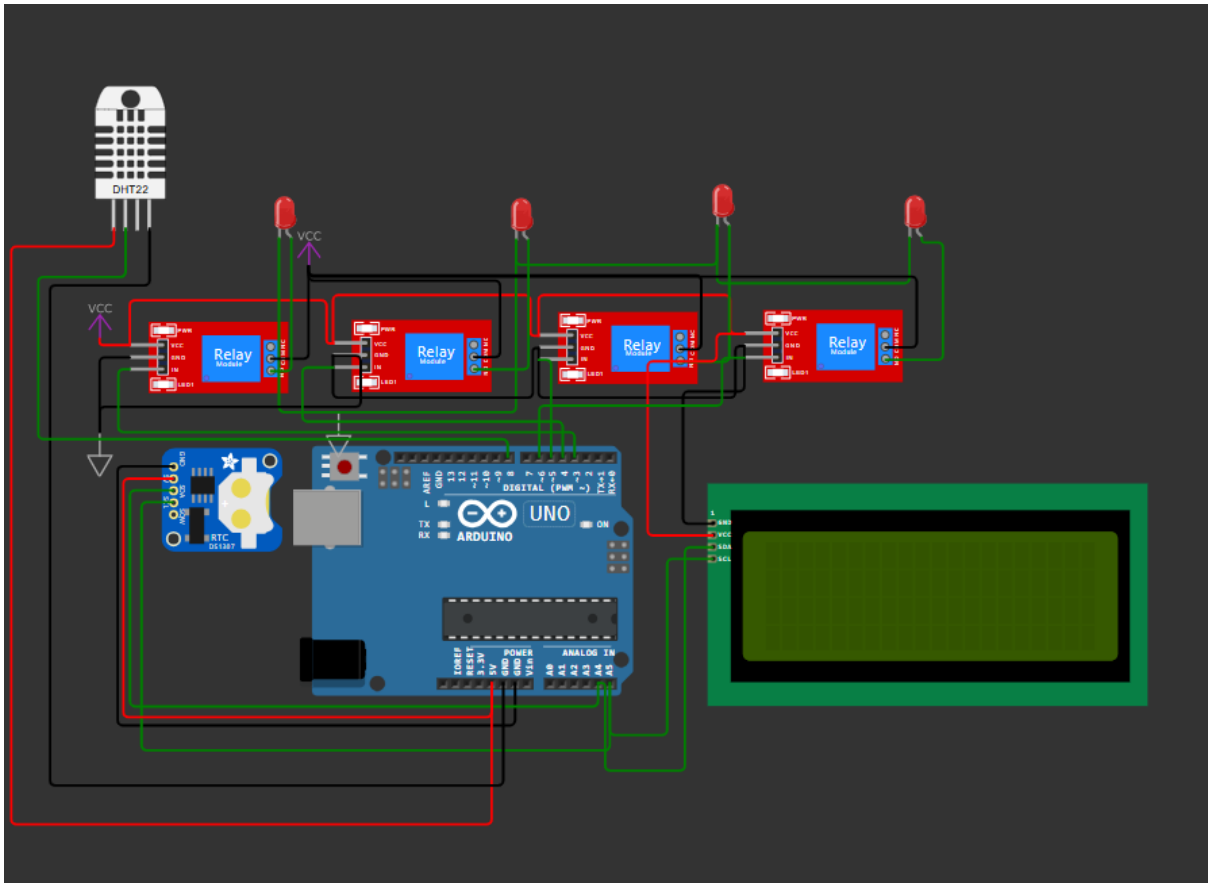
```
  }


  Serial.print(F("Humidity: "));
  Serial.print(humidity);
  Serial.print(F("%  Temperature: "));
  Serial.print(temperature);
  Serial.println(F("°C "));
  lcd.setCursor(0,3);
    lcd.print("temp:");
    lcd.println(temperature);
    lcd.setCursor(10,3);
    lcd.print("hum:");
    lcd.println(humidity);
  delay(2000);
}



  DateTime now = rtc.now();
```

```
Serial.print("Current time: ");
Serial.print(now.year(), DEC);
Serial.print('/');
Serial.print(now.month(), DEC);
Serial.print('/');
Serial.print(now.day(), DEC);
Serial.print(" (");
Serial.print(daysOfTheWeek[now.dayOfTheWeek()]);
Serial.print(") ");
Serial.print(now.hour(), DEC);
Serial.print(':');
Serial.print(now.minute(), DEC);
Serial.print(':');
Serial.print(now.second(), DEC);
Serial.println();
Serial.println();
delay(3000);
lcd.setCursor(3,0);
lcd.print("Time:");
lcd.print(now.hour(), DEC);
```

```
lcd.print(':');
lcd.print(now.minute(), DEC);
lcd.print(':');
lcd.print(now.second(), DEC);

if((now.second()> 1) && (now.second()<15))
{
lcd.setCursor(0,1);
lcd.print("Relay1:ON ");

 Serial.println("relay1 is on");
 digitalWrite(relay1, HIGH);
}
else{
  lcd.setCursor(0,1);
  lcd.print("Relay1:Off");
  digitalWrite(relay1,LOW);
}

 if((now.second()> 20) && (now.second()<30))
```

```
{
lcd.setCursor(10,1);
lcd.print("Relay2:ON ");
 Serial.println("relay2 is on");
 digitalWrite(relay2, HIGH);
}
else{
 lcd.setCursor(10,1);
lcd.print("Relay2:OFF");
digitalWrite(relay2,LOW);
}
if((now.second()> 35) && (now.second()<45))
{
 lcd.setCursor(0,2);
lcd.print("Relay3:ON ");
 Serial.println("relay3 is on");
 digitalWrite(relay3, HIGH);
}
else{
  lcd.setCursor(0,2);
```

```
 lcd.print("Relay3:OFF");
 digitalWrite(relay3,LOW);
 }
  if((now.second()> 50) && (now.second()<59))
 {
   lcd.setCursor(10,2);
 lcd.print("Relay4:ON ");
  Serial.println("relay4 is on");
  digitalWrite(relay4, HIGH);
 }
 else{
   lcd.setCursor(10,2);
 lcd.print("Relay4:OFF");
 digitalWrite(relay4,LOW);
 }



}
```



Smart Alarm Clock:

/* ----- C Program for Arduino based Alarm Clock ---- */

#include <Wire.h>

#include<EEPROM.h>

```
#include <RTClib.h>

#include <LiquidCrystal.h>

const int rs = 8;
const int en = 9;
const int d4 = 10;
const int d5 = 11; //DISPLAY
const int d6 = 12;
const int d7 = 13;

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

RTC_DS1307 RTC;

int temp,inc,hours1,minut,add=11;

int next=7;

int INC=6;
```

```
int set_mad=5;

#define buzzer 3

int HOUR,MINUT,SECOND;



void setup()

{

 Wire.begin();

 RTC.begin();

 lcd.begin(16,2);

 pinMode(INC, INPUT);
```

```
pinMode(next, INPUT);

pinMode(set_mad, INPUT);

pinMode(buzzer, OUTPUT);

digitalWrite(next, HIGH);

digitalWrite(set_mad, HIGH);

digitalWrite(INC, HIGH);



  lcd.setCursor(0,0);

  lcd.print("Real Time Clock");

  lcd.setCursor(0,1);
```

```
  lcd.print("Circuit Digest ");

   delay(2000);



if(!RTC.isrunning())

{

RTC.adjust(DateTime(__DATE__,__TIME__));

}

}



void loop()
```

```
{
  int temp=0,val=1,temp4;
  DateTime now = RTC.now();
  if(digitalRead(set_mad) == 0)      //set Alarm time
  {
    lcd.setCursor(0,0);
    lcd.print("  Set Alarm  ");
   delay(2000);
   defualt();
   time();
```

```
    delay(1000);

    lcd.clear();

    lcd.setCursor(0,0);

    lcd.print("  Alarm time ");

    lcd.setCursor(0,1);

    lcd.print(" has been set  ");

    delay(2000);

}

lcd.clear();

lcd.setCursor(0,0);
```

```
lcd.print("Time:");

lcd.setCursor(6,0);

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

lcd.print(":");

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

lcd.print(":");

lcd.print(SECOND=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);

 match();

 delay(200);

}

void defualt()

{

  lcd.setCursor(0,1);
```

```
  lcd.print(HOUR);

  lcd.print(":");

  lcd.print(MINUT);

  lcd.print(":");

  lcd.print(SECOND);

}

/*Function to set alarm time and feed time into
Internal eeprom*/

void time()

{
```

```
int temp=1,minuts=0,hours=0,seconds=0;

  while(temp==1)

  {

   if(digitalRead(INC)==0)

   {

    HOUR++;

    if(HOUR==24)

    {

     HOUR=0;

    }
```

```
  while(digitalRead(INC)==0);

 }

 lcd.clear();

  lcd.setCursor(0,0);

lcd.print("Set Alarm Time ");

//lcd.print(x);

 lcd.setCursor(0,1);

 lcd.print(HOUR);

 lcd.print(":");

 lcd.print(MINUT);
```

```
lcd.print(":");

lcd.print(SECOND);

delay(100);

if(digitalRead(next)==0)

{

  hours1=HOUR;

  EEPROM.write(add++,hours1);

 temp=2;

 while(digitalRead(next)==0);

}
```

```
}



while(temp==2)

{

 if(digitalRead(INC)==0)

 {

  MINUT++;

  if(MINUT==60)

  {MINUT=0;}

  while(digitalRead(INC)==0);
```

```
 }

 // lcd.clear();

lcd.setCursor(0,1);

lcd.print(HOUR);

lcd.print(":");

lcd.print(MINUT);

lcd.print(":");

lcd.print(SECOND);

delay(100);

  if(digitalRead(next)==0)
```

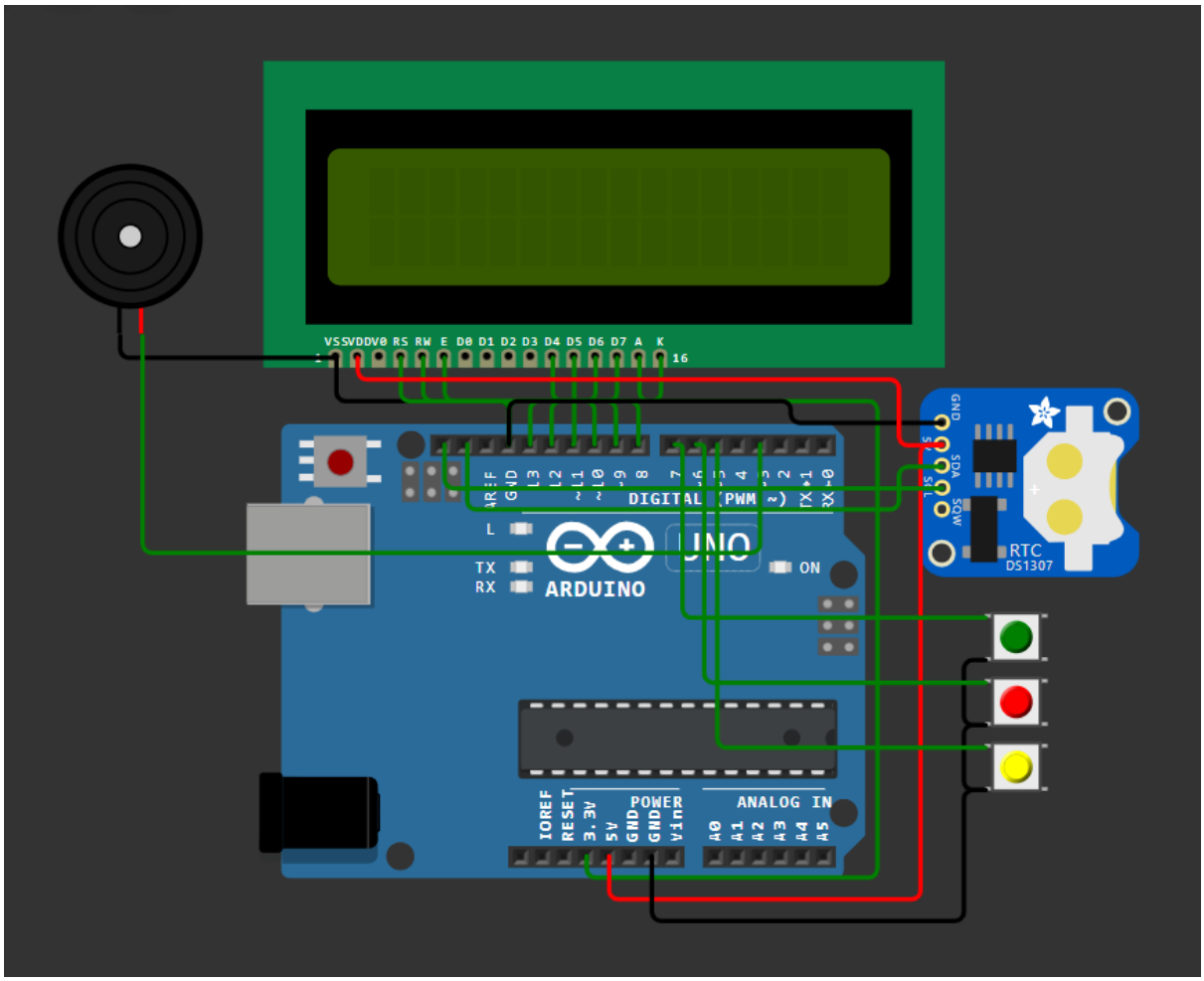
```
      {

       minut=MINUT;

       EEPROM.write(add++, minut);

       temp=0;

       while(digitalRead(next)==0);

      }

    }

    delay(1000);

}


/* Function to chack medication time */
```

```
void match()

{

  int tem[17];

  for(int i=11;i<17;i++)

  {

    tem[i]=EEPROM.read(i);

  }

  if(HOUR == tem[11] && MINUT == tem[12])

  {

   beep();
```

```
beep();

beep();

beep();

lcd.clear();

lcd.print("Wake Up.....");

lcd.setCursor(0,1);

lcd.print("Wake Up.....");

beep();

beep();

beep();
```

```
   beep();

  }

}

/* function to buzzer indication */

void beep()

{

   digitalWrite(buzzer,HIGH);

   delay(500);

   digitalWrite(buzzer, LOW);

   delay(500);
```

}


VSSVDDV0 RS RW E D0 D1 D2 D3 D4 D5 D6 D7 A K
16
DIGITAL (PWM ~)
L
TX
RX
ARDUINO
UNO
ON
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5
SCL
SDA
GND
RTC
DS1307