Smart Distance : Motion sensor(HCSR04) , Buzzer and LCD -

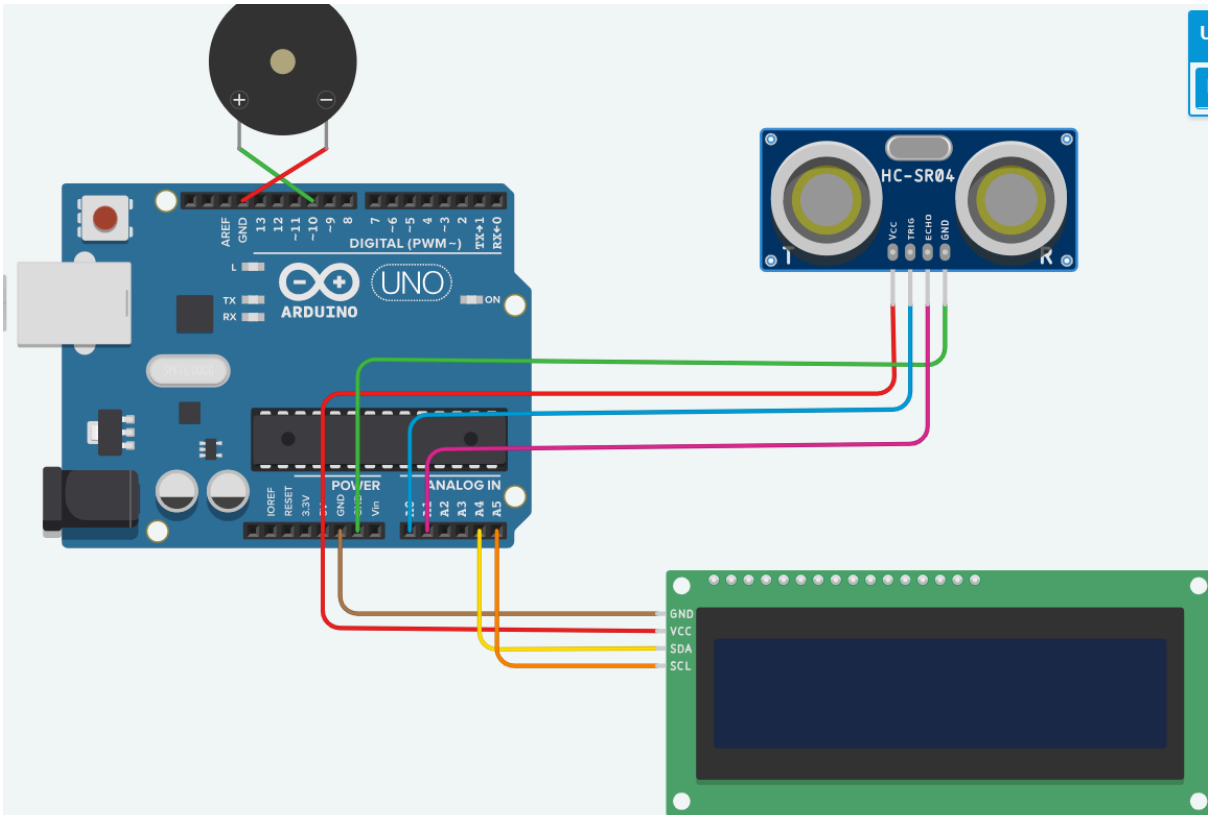

Fig 1. Block Diagram

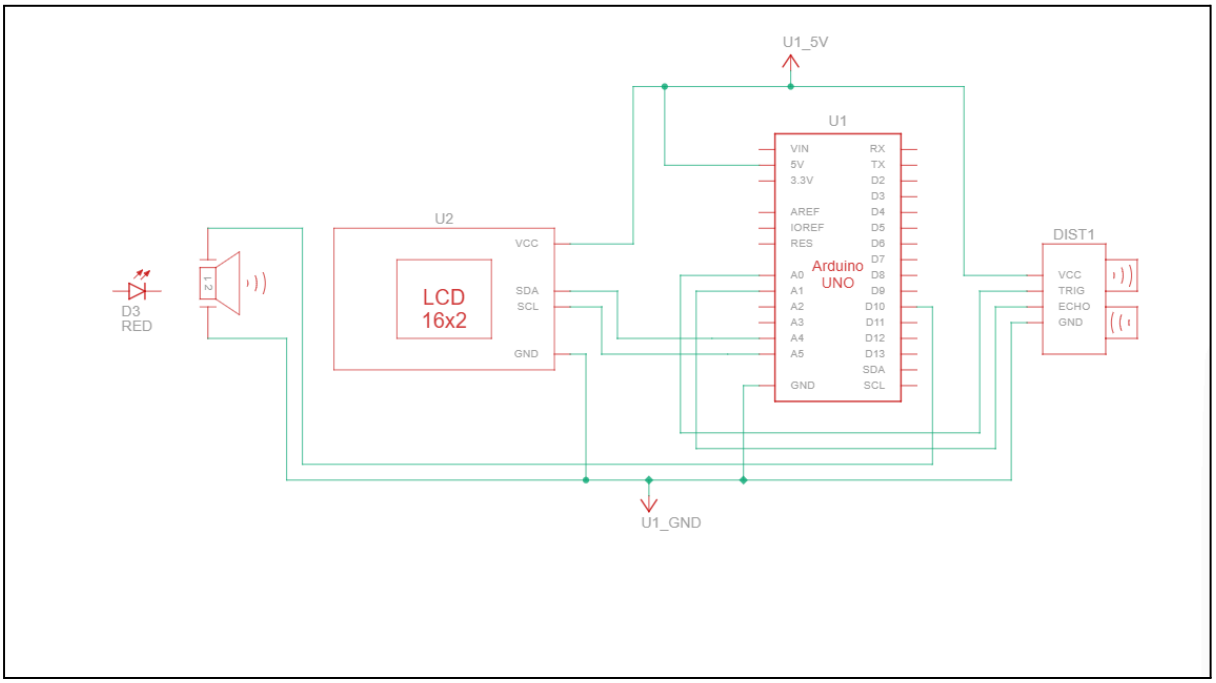

Fig 2. Circuit diagram

Code

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

// Create LCD object (I2C address 0x27, 16x2 display)
LiquidCrystal_I2C lcd(0x27, 16, 2);

// Define pins
#define trigPin A0      // HC-SR04 Trig pin
#define echoPin A1      // HC-SR04 Echo pin
#define buzzerPin 10    // Buzzer connected to digital pin 10

// Variables
long duration;
float distance;
float distanceInch;

void setup() {
  // Pin setup
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(buzzerPin, OUTPUT);

  // LCD setup
  lcd.init();
  lcd.backlight();
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Smart Distance");
  delay(2000);
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Distance:");
}

void loop() {
  // Send ultrasonic pulse
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  // Measure the echo duration
  duration = pulseIn(echoPin, HIGH);

  // Calculate distance (in cm and inches)
  distance = (duration * 0.034) / 2;     // distance in cm
```

```
  distanceInch = duration * 0.0133 / 2;  // distance in inches (optional)

  // Display distance
  lcd.setCursor(10, 0);
  lcd.print("    "); // clear old reading
  lcd.setCursor(10, 0);
  lcd.print(distance, 1);
  lcd.print("cm");

  // Check distance condition
  if (distance <= 10 && distance > 0) {
    digitalWrite(buzzerPin, HIGH);  // Turn ON buzzer
    lcd.setCursor(0, 1);
    lcd.print("Too Close! Alarm ");
  } else {
    digitalWrite(buzzerPin, LOW);   // Turn OFF buzzer
    lcd.setCursor(0, 1);
    lcd.print("                "); // Clear second line
  }

  delay(300);  // Slight delay for stable readings
}
```

Hardware connection :

Component	Arduino Pin	Notes
HC-SR04 Trig	A0	Output signal from Arduino
HC-SR04 Echo	A1	Input signal to Arduino
HC-SR04 VCC	5V	Power
HC-SR04 GND	GND	Ground
Buzzer +	D10	Controlled output
Buzzer -	GND	Ground
LCD (I2C)	SDA → A4, SCL → A5	(Default I2C pins on Arduino Uno)

⚠️ IF “No such file or directory” ERROR OCCURS

This specific error means:The Arduino IDE cannot find the `LiquidCrystal_I2C.h` library in your system’s library folders.

So the **code itself is correct**, but your **Arduino IDE setup is missing the required library** files.

📁 How Arduino Finds Libraries

Arduino looks for libraries in two main places:

1. **Global library folder** → e.g., `Documents/Arduino/libraries/`
2. **Built-in libraries folder** (part of Arduino installation)

If `LiquidCrystal_I2C.h` is not found in either of these, it throws the “No such file or directory” error.

✅ HOW TO FIX IT

🧩 Step 1: Install the Missing Library

In your **Arduino IDE**:

1. Go to **Sketch → Include Library → Manage Libraries...**
   In the **Library Manager**, search for: `LiquidCrystal I2C`
2. Install **“LiquidCrystal I2C by Frank de Brabander”** (or similar trusted version).

🧩 Step 2: Verify the Library Name and Header

Some libraries use slightly different names.
If you installed a different version, the header might need to be:

```
#include <LiquidCrystal_I2C.h>      // ✅ Most common
// or
#include <LiquidCrystal_I2C_By_FDB.h> // ❌ Rare variant
```

Make sure your file name exactly matches the header file in the library folder

🧩 Step 3: Recompile

After installing the correct library:

- Restart Arduino IDE.
- Open your sketch again.
- Click **Verify / Compile**.

The error should disappear.