Ex: 12

Monitor LM35 Temperature Sensor and Ultrasonic Distance Measurement

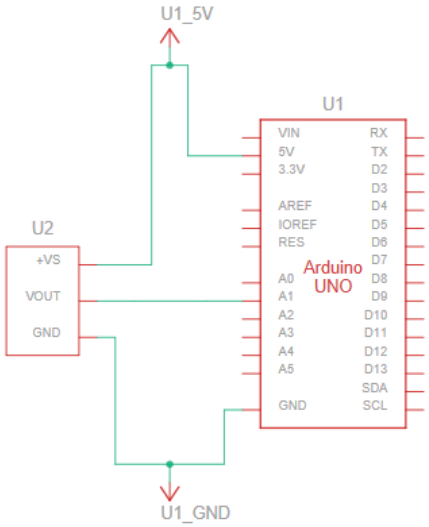
Aim:

To implement monitoring of LM35 Temperature Sensor and Ultrasonic Distance Measurement using Arduino Uno.

Components Required:

- Arduino Uno Board
- LM35 Temperature Sensor
- Ultrasonic Distance Sensor
- Jumpers

Circuit Connection (Temperature Sensor):



Pin Connections between LM35 Temperature Sensor and Arduino UNO

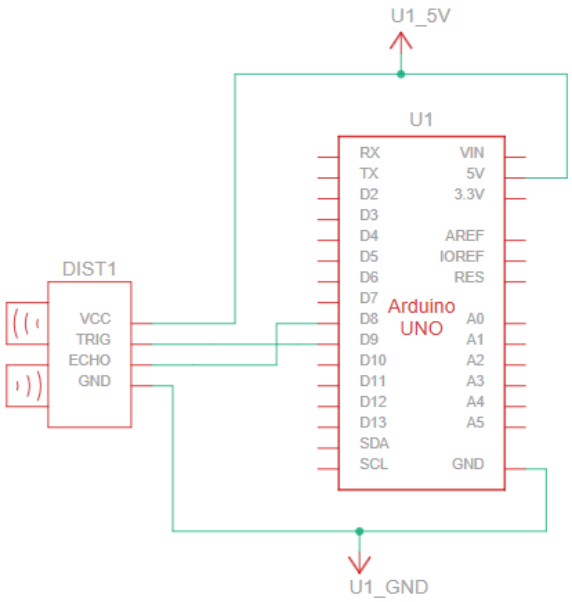
LM35	Arduino UNO Pin
Ground	Ground
VOT	A1
Power	+5V

Sketch(Temperature Sensor)

```
int val;
int tempPin = 1;

void setup()
{
  Serial.begin(9600);
}
void loop()
{
  val = analogRead(tempPin);
  float mv = ( val/1024.0)*5000;
  float cel = mv/10;
  Serial.print("Temperature = ");
  Serial.print(cel);
  Serial.print(" Celcius");
  Serial.println();
  delay(1000);
}
```

Circuit Connection (Ultrasonic Distance Measurement):



Pin Connections between Ultrasonic Distance Sensor and Arduino UNO

Ultrasonic Sensor	Arduino UNO Pin
Ground	Ground
ECHO	D8
TRIG	D9
VCC	+5V

Sketch(Ultrasonic Distance)

```
int trigPin = 9;    // TRIG pin
int echoPin = 8;    // ECHO pin
float duration_us, distance_cm;

void setup() {
  // begin serial port
  Serial.begin (9600);
  // configure the trigger pin to output mode
  pinMode(trigPin, OUTPUT);
  // configure the echo pin to input mode
  pinMode(echoPin, INPUT);
}
void loop() {
  // generate 10-microsecond pulse to TRIG pin
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  // measure duration of pulse from ECHO pin
  duration_us = pulseIn(echoPin, HIGH);
  // calculate the distance
  distance_cm = 0.017 * duration_us;
  // print the value to Serial Monitor
  Serial.print("distance: ");
  Serial.print(distance_cm);
  Serial.println(" cm");
  delay(500);
}
```

Result:

Thus Arduino Uno board is utilized to monitor LM35 Temperature Sensor and Ultrasonic Distance Sensor.