ARDUINO PROGRAMS

2. Measure the distance using ultrasonic sensors and make an LED Blink using Arduino

```
const int trigPin = 9;
const int echoPin = 10;
const int ledPin = 3;
long duration;
int distance;


void setup(){
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}

void loop(){
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);
  distance = duration*0.0343/2;
  Serial.print(duration);
  Serial.print(" Distance: ");
  Serial.print(distance);
  Serial.print(" cm");
  Serial.println();
  if(distance<10){
    digitalWrite(ledPin, HIGH);
  }
  else{
    digitalWrite(ledPin, LOW);
  }
  delay(500);

}
```

3. Detect the vibration of an object using Arduino

```
const int vibrationPin = 2;
const int ledPin = 7;

void setup() {
  pinMode(vibrationPin, INPUT);
  pinMode(ledPin, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int vibrationState = digitalRead(vibrationPin);

  if (vibrationState == LOW) {
    digitalWrite(ledPin, HIGH);
    Serial.println("Vibration Detected!");
    delay(500);
  } else {
    digitalWrite(ledPin, LOW);
    delay(500);
  }
}
```

4. Temperature Notification using Arduino.

```
#include <DHT.h>

#define DHTPIN 2
#define DHTTYPE DHT11

DHT dht(DHTPIN, DHTTYPE);

const float tempThreshold = 30.0;

void setup() {
  Serial.begin(115200);
  unsigned long startMillis = millis();
  while ((millis() - startMillis) < 5000) {
    Serial.println("Initializing DHT Sensor...");
  }
  dht.begin();
}

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

  if (isnan(temp) || isnan(humidity)) {
    Serial.println("Failed to read from DHT sensor!");
    delay(2000);
    return;
  }

  Serial.print("Temperature: ");
  Serial.print(temp);
  Serial.print(" °C, Humidity: ");
  Serial.print(humidity);
  Serial.println(" %");

  if (temp > tempThreshold) {
    Serial.println("ALERT: Temperature exceeded threshold!");
  }

  delay(5000);
}
```

5. LDR to vary LED Light intensity using Arduino.

```
int light;

void setup() {
  pinMode(8, OUTPUT);       // LED connected to digital pin 8
  Serial.begin(9600);       // Start serial communication
}

void loop() {
  light = analogRead(A0);   // Read LDR value from analog pin A0

  Serial.print("LDR Value: ");
  Serial.println(light);    // Print LDR value for observation

  if (light > 250) {
    digitalWrite(8, HIGH);  // Turn ON LED when it's bright
    // digitalWrite(13, HIGH); // Uncomment if using built-in LED
  } else {
    digitalWrite(8, LOW);   // Turn OFF LED when it's dark
    // digitalWrite(13, LOW);  // Uncomment if using built-in LED
  }

  delay(200);               // Delay for stability
}


  delay(100);  // Short delay to avoid flickering
}
```