

## Practical No.:03

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COURSE: AI&DS

CLASS: BE

SUB:Computer Laboratory-I (Machine Learning)"

**Title:** Write a program for developing an IIoT application for energy monitoring and optimization.

### #Code:

```
// Define pin numbers

const int voltagePin = A0; // Potentiometer simulating voltage connected to A0

const int currentPin = A1; // Potentiometer simulating current connected to A1

const int ledPin = 8;    // LED connected to digital pin 8


// Set a power threshold for alert (in arbitrary units)

const float powerThreshold = 20.0;


void setup() {

    // Initialize Serial communication for monitoring

    Serial.begin(9600);


    // Set LED pin as output

    pinMode(ledPin, OUTPUT);


    Serial.println("Energy Monitoring System Initialized...");

}


void loop() {

    // Read the voltage and current values from potentiometers

    int voltageValue = analogRead(voltagePin);

    int currentValue = analogRead(currentPin);
```

```
// Convert the analog readings to a voltage/current range

// assuming each potentiometer gives 0 to 5V, scaled from 0 to 1023

float voltage = voltageValue * (5.0 / 1023.0);

float current = currentValue * (5.0 / 1023.0);


// Calculate power consumption (Power = Voltage * Current)

float power = voltage * current;


// Display readings on Serial Monitor

Serial.print("Voltage: ");

Serial.print(voltage);

Serial.print(" V, Current: ");

Serial.print(current);

Serial.print(" A, Power: ");

Serial.print(power);

Serial.println(" W");


// Check if the power exceeds the threshold

if (power > powerThreshold) {

    // Turn on LED for alert

    digitalWrite(ledPin, HIGH);

    Serial.println("Alert: High Power Consumption Detected!");

} else {

    // Turn off LED if below threshold

    digitalWrite(ledPin, LOW);

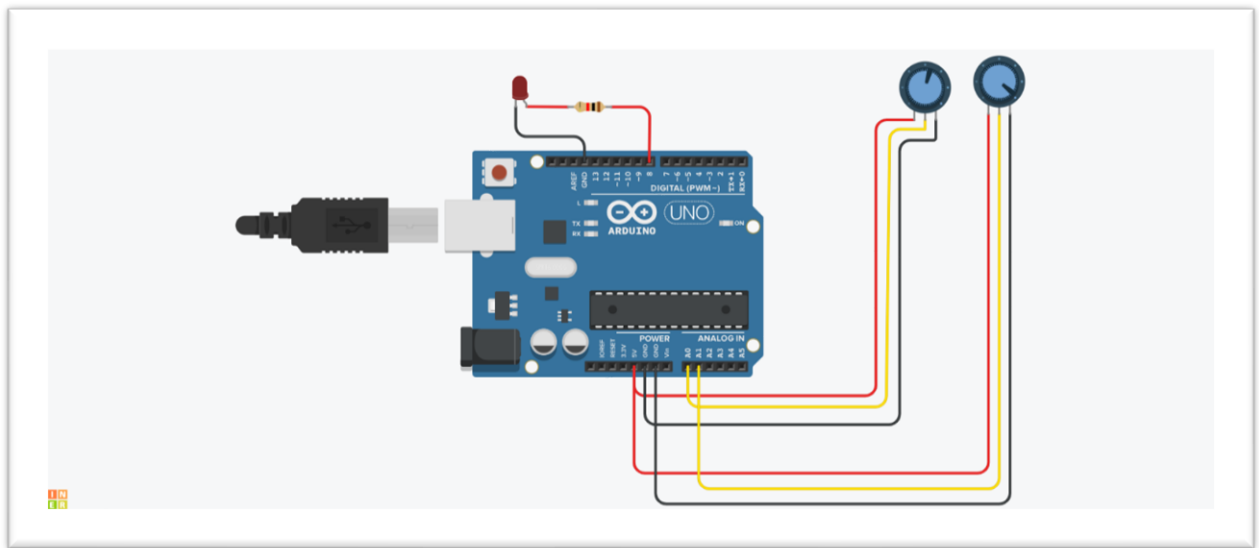
}


// Wait a second before the next reading

delay(1000);

}
```

## #Circuit Diagram:



## #Output:

0 A, Power: 5.51 W

Voltage: 1.90 V, Current: 2.20 A, Power: 4.18 W

Voltage: 1.90 V, Current: 2.20 A, Power: 4.18 W

Voltage: 1.90 V, Current: 0.60 A, Power: 1.14 W

Voltage: 1.90 V, Current: 0.60 A, Power: 1.14 W

Voltage: 1.90 V, Current: 0.10 A, Power: 0.19 W

Voltage: 2.70 V, Current: 0.10 A, Power: 0.26 W

Voltage: 2.70 V, Current: 0.10 A, Power: 0.26 W

Voltage: 2.70 V, Current: 0.10 A, Power: 0.26 W

Voltage: 2.70 V, Current: 0.10 A, Power: 0.26 W

Voltage: 4.80 V, Current: 0.10 A, Power: 0.47 W

Voltage: 4.80 V, Current: 0.10 A, Power: 0.47 W

Voltage: 4.80 V, Current: 0.10 A, Power: 0.47 W

Voltage: 3.30 V, Current: 0.10 A, Power: 0.32 W

Voltage: 3.30 V, Current: 0.10 A, Power: 0.32 W

Voltage: 1.80 V, Current: 0.10 A, Power: 0.18 W

Voltage: 1.10 V, Current: 0.10 A, Power: 0.11 W

Voltage: 0.20 V, Current: 0.10 A, Power: 0.02 W