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6. SOURCE CODE

6.1 Temperature Sensor

```
const int analogPin = A0; // Analog pin connected to the temperature sensor
void setup() {
  pinMode(A0, INPUT);
  pinMode(12, OUTPUT);
  pinMode(8, OUTPUT);
  Serial.begin(9600); // Initialize serial communication
}
void loop() {
  int sensorValue = analogRead(analogPin); // Read analog value from the temperature sensor
  float voltage = sensorValue * (5.0 / 1023.0); // Convert analog value to voltage
  float temperature = (voltage - 0.5) * 100; // Convert voltage to temperature in degrees celsius
```

```
  if (temperature > 30) {
    digitalWrite(12, HIGH);
    digitalWrite(8, LOW);
  } else if (temperature < 25) {
    digitalWrite(12, LOW);
    digitalWrite(8, HIGH);
  } else {
```

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```
    digitalWrite(12, LOW);
    digitalWrite(8, LOW);
  }
  Serial.print("Analog Value: ");
  Serial.print(sensorValue);
  Serial.print(", Voltage: ");
  Serial.print(voltage);
  Serial.print("V, Temperature: ");
  Serial.print(temperature);
  Serial.println("°C");
  delay(100); // Delay for stability
```

6.2 pH Sensor

```
int sensorValue = 0;
```

```

int outputValue = 0;
void setup()
{
  pinMode(A0, INPUT);
  pinMode(9, OUTPUT);
  pinMode(6, OUTPUT);
  Serial.begin(9600);
}
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void loop()
{
  sensorValue = analogRead(A0); // read the analog in value
  outputValue = map(sensorValue, 0, 1023, 0, 255); // map it to the range of the analog out
  // change the analog out value:
  if (outputValue > 85) {
    digitalWrite(9, HIGH);
    digitalWrite(6, LOW);
  } else if (outputValue < 65) {
    digitalWrite(9, LOW);
    digitalWrite(6, HIGH);
  } else {
    digitalWrite(9, LOW);
    digitalWrite(6, LOW);
  }
  // print the results to the serial monitor:
  Serial.print("sensor = ");
  Serial.print(sensorValue);
  Serial.print("\t output = ");
  Serial.println(outputValue);
  // wait 2 milliseconds before the next loop for the
  // analog-to-digital converter to settle after the
  // last reading:
  delay(2); // Wait for 2 millisecond(s)}

```

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6.3 Dissolved Oxygen Sensor Circuit

```

int currentO2Level = 0;
int wantedO2Level = 0;
void setup()
{
  Serial.begin(9600);
  pinMode(A5, INPUT);
  pinMode(2, OUTPUT);
}
void loop()
{
  wantedO2Level = 155;
  Serial.println(currentO2Level);
  currentO2Level = analogRead(A5);
  if (currentO2Level < wantedO2Level) {
    digitalWrite(2, HIGH);
  } else {
    digitalWrite(2, LOW);
  }
  delay(10); // Delay a little bit to improve simulation performance

```

```

}
6.4 Turbidity sensor circuit
float adc = 0;
float U = 0;
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float a = 0;
float b = 0;
float c = 0;
float Turbidity = 0;
void setup()
{
  pinMode(A0, INPUT);
  Serial.begin(9600);
}
void loop()
{
  adc = analogRead(A0); // How to declare adc
  U = ((5 * adc) / 1023);
  a = (5742.3 * U);
  b = (1120.4 * (U * U));
  c = 4352.9;
  Turbidity = (a - (b + c));
  Serial.println(Turbidity);
  delay(10); // Delay a little bit to improve simulation performance
  if (Turbidity > 2000)
  { digitalWrite(8, HIGH);
  }
  else {
    digitalWrite(8, LOW);
  }
}

```

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7. OUTPUT

7.1 Temperature sensor Output

When the temperature is high or low, the LEDs glow; otherwise, the output indicates that the temperature is normal. In this case, the LEDs are not glow. Serial monitor, it keeps track of sensor/Analog value, voltage and Temperature information. Based on formulas the sensor value is converted to voltage and voltage is converted to temperature value which are stored in voltage and temperature.

Fig. This output indicates that the temperature level is high(>30)

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Fig. This output indicates that the temperature level is low(85)

Fig. This output indicates that the ph level is low(

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// for the analog-to-digital converter to settle // after the last reading: delay(2); } ADC Example . Author: Anurag Dwivedi
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