**TASK 1**

Wired up Arduido to circuit. Entered code in Arduino IDE.

**TASK 2**

**void loop(){**

**// read the value on AnalogIn pin 0 and store it in a variable**

**int sensorVal = analogRead(SENSOR\_PIN);**

**// send the 10-bit sensor value out the serial port**

**Serial.print("sensor Value: ");**

**Serial.print(sensorVal);**

**// convert the ADC reading to voltage**

**float voltage = (sensorVal/1023.0) \* 5.0;**

**// Send the voltage level out the Serial port**

**Serial.print(", Volts: ");**

**Serial.print(voltage);**

**// convert the voltage to temperature in degrees C**

**// the sensor changes 10 mV per degree**

**// the datasheet says there's a 500 mV offset**

**// ((voltage - 500mV) times 100)**

**float temperature = (voltage - 0.5) \* 100;**

**if (BASELINE\_TEMP > temperature){**

**Serial.print(", degrees C: ");**

**Serial.print(temperature);**

**Serial.print(" ,");**

**Serial.print(BASELINE\_TEMP-temperature);**

**Serial.println(" Degrees below baseline temperature");**

**}else{**

**Serial.print(", degrees C: ");**

**Serial.print(temperature);**

**Serial.print(" ,");**

**Serial.print(temperature-BASELINE\_TEMP);**

**Serial.println(" Degrees above baseline temperature");**

**}**

**// if the current temperature is less than 2 degrees above the baseline**

**// turn off all LEDs**

**if(temperature < BASELINE\_TEMP + 2){**

**digitalWrite(2, LOW);**

**digitalWrite(3, LOW);**

**digitalWrite(4, LOW);**

**} // if the temperature rises 2-4 degrees, turn an LED on**

**else if(temperature < BASELINE\_TEMP + 4){**

**digitalWrite(2, HIGH);**

**digitalWrite(3, LOW);**

**digitalWrite(4, LOW);**

**} // if the temperature rises 4-6 degrees, turn a second LED on**

**else if(temperature < BASELINE\_TEMP + 6){**

**digitalWrite(2, HIGH);**

**digitalWrite(3, HIGH);**

**digitalWrite(4, LOW);**

**} // if the temperature rises more than 6 degrees, turn all LEDs on**

**else{**

**digitalWrite(2, HIGH);**

**digitalWrite(3, HIGH);**

**digitalWrite(4, HIGH);**

**}**

**delay(1);**

**}**

**TASK 3**

**// named constant for the pin the sensor is connected to**

**const int SENSOR\_PIN = A0;**

**int sensorVal;**

**float voltage, temperature, baselineTemp;**

**// room temperature in Celcius**

**void setup(){**

**// open a serial connection to display values**

**Serial.begin(9600);**

**// set the LED pins as outputs**

**// the for() loop saves some extra coding**

**for(int pinNumber = 2; pinNumber<5; pinNumber++){**

**pinMode(pinNumber,OUTPUT);**

**digitalWrite(pinNumber, LOW);**

**sensorVal = analogRead(SENSOR\_PIN);**

**voltage = (sensorVal/1023.0) \* 5.0;**

**temperature = (voltage - 0.5) \* 100;baselineTemp=temperature;**

**}**

**}**

**void loop(){**

**// read the value on AnalogIn pin 0 and store it in a variable**

**sensorVal = analogRead(SENSOR\_PIN);**

**// send the 10-bit sensor value out the serial port**

**Serial.print("sensor Value: ");**

**Serial.print(sensorVal);**

**// convert the ADC reading to voltage**

**voltage = (sensorVal/1023.0) \* 5.0;**

**// Send the voltage level out the Serial port**

**Serial.print(", Volts: ");**

**Serial.print(voltage);**

**// convert the voltage to temperature in degrees C**

**// the sensor changes 10 mV per degree**

**// the datasheet says there's a 500 mV offset**

**// ((voltage - 500mV) times 100)**

**temperature = (voltage - 0.5) \* 100;**

**if (baselineTemp > temperature){**

**Serial.print(", degrees C: ");**

**Serial.print(temperature);**

**Serial.print(" ,");**

**Serial.print(baselineTemp-temperature);**

**Serial.println(" Degrees below baseline temperature");**

**}else{**

**Serial.print(", degrees C: ");**

**Serial.print(temperature);**

**Serial.print(" ,");**

**Serial.print(temperature-baselineTemp);**

**Serial.println(" Degrees above baseline temperature");**

**}**

**// if the current temperature is less than 2 degrees above the baseline**

**// turn off all LEDs**

**if(temperature < baselineTemp + 2){**

**digitalWrite(2, LOW);**

**digitalWrite(3, LOW);**

**digitalWrite(4, LOW);**

**} // if the temperature rises 2-4 degrees, turn an LED on**

**else if(temperature < baselineTemp + 4){**

**digitalWrite(2, HIGH);**

**digitalWrite(3, LOW);**

**digitalWrite(4, LOW);**

**} // if the temperature rises 4-6 degrees, turn a second LED on**

**else if(temperature < baselineTemp + 6){**

**digitalWrite(2, HIGH);**

**digitalWrite(3, HIGH);**

**digitalWrite(4, LOW);**

**} // if the temperature rises more than 6 degrees, turn all LEDs on**

**else{**

**digitalWrite(2, HIGH);**

**digitalWrite(3, HIGH);**

**digitalWrite(4, HIGH);**

**}**

**delay(1);**

**}**

**TASK 4**

// named constant for the pin the sensor is connected to

const int SENSOR\_PIN = A0;

int sensorVal;

float voltage, temperature, baselineTemp;

// room temperature in Celcius

void setup(){

// open a serial connection to display values

Serial.begin(9600);

// set the LED pins as outputs

// the for() loop saves some extra coding

for(int pinNumber = 2; pinNumber<6; pinNumber++){

pinMode(pinNumber,OUTPUT);

digitalWrite(pinNumber, LOW);

sensorVal = analogRead(SENSOR\_PIN);

voltage = (sensorVal/1023.0) \* 5.0;

temperature = (voltage - 0.5) \* 100;baselineTemp=temperature;

}

}

void loop(){

// read the value on AnalogIn pin 0 and store it in a variable

sensorVal = analogRead(SENSOR\_PIN);

// send the 10-bit sensor value out the serial port

Serial.print("sensor Value: ");

Serial.print(sensorVal);

// convert the ADC reading to voltage

voltage = (sensorVal/1023.0) \* 5.0;

// Send the voltage level out the Serial port

Serial.print(", Volts: ");

Serial.print(voltage);

// convert the voltage to temperature in degrees C

// the sensor changes 10 mV per degree

// the datasheet says there's a 500 mV offset

// ((voltage - 500mV) times 100)

temperature = (voltage - 0.5) \* 100;

if (baselineTemp > temperature){

Serial.print(", degrees C: ");

Serial.print(temperature);

Serial.print(" ,");

Serial.print(baselineTemp-temperature);

Serial.println(" Degrees below baseline temperature");

}else{

Serial.print(", degrees C: ");

Serial.print(temperature);

Serial.print(" ,");

Serial.print(temperature-baselineTemp);

Serial.println(" Degrees above baseline temperature");

}

// if the current temperature is less than 2 degrees above the baseline

// turn off all LEDs

if(temperature < baselineTemp + 2){

digitalWrite(2, LOW);

digitalWrite(3, LOW);

digitalWrite(4, LOW);

digitalWrite(5, LOW);

} // if the temperature rises 2-4 degrees, turn an LED on

else if(temperature < baselineTemp + 4){

digitalWrite(2, HIGH);

digitalWrite(3, LOW);

digitalWrite(4, LOW);

digitalWrite(5, LOW);

} // if the temperature rises 4-6 degrees, turn a second LED on

else if(temperature < baselineTemp + 6){

digitalWrite(2, HIGH);

digitalWrite(3, HIGH);

digitalWrite(4, LOW);

digitalWrite(5, LOW);

} // if the temperature rises 6-8 degrees, turn a third LED on

else if(temperature < baselineTemp + 8){

digitalWrite(2, HIGH);

digitalWrite(3, HIGH);

digitalWrite(4, HIGH);

digitalWrite(5, LOW);

}//if the temperature rises above 8 degrees, leave three LEDs on and blink a 4th

else{

digitalWrite(2, HIGH);

digitalWrite(3, HIGH);

digitalWrite(4, HIGH);

digitalWrite(5, HIGH);

delay(500);

digitalWrite(5, LOW);

delay(500);

}

}