Tirona, Victor Lorenzo B. 12 Nov 2019
Montesclaros, Ray Mart ELC 151.2

Laboratory 7

Figure 1 shows the temperature obtained from the sensor versus the expected temperature over 3500 samples. The red dotted lines are the upper and lower thresholds of 95 and 85 degrees Celsius. The orange line represents the target temperature of 90 degrees Celsius. The blue signal represents the temperature obtained from the sensor. As can be seen from the figure, the temperature rose at the start as the soldering iron was being powered to reach the target temperature. Once the target temperature is reached, the soldering iron is turned off by the relay. Once the temperature falls below the target temperature, the soldering iron is turned on again.

The samples obtained from the Arduino can be seen in this spreadsheet (https://drive.google.com/file/d/1bt-YvdhFrcfwWLoJroF8G8nPitmQTSVf/view?usp=sharing).

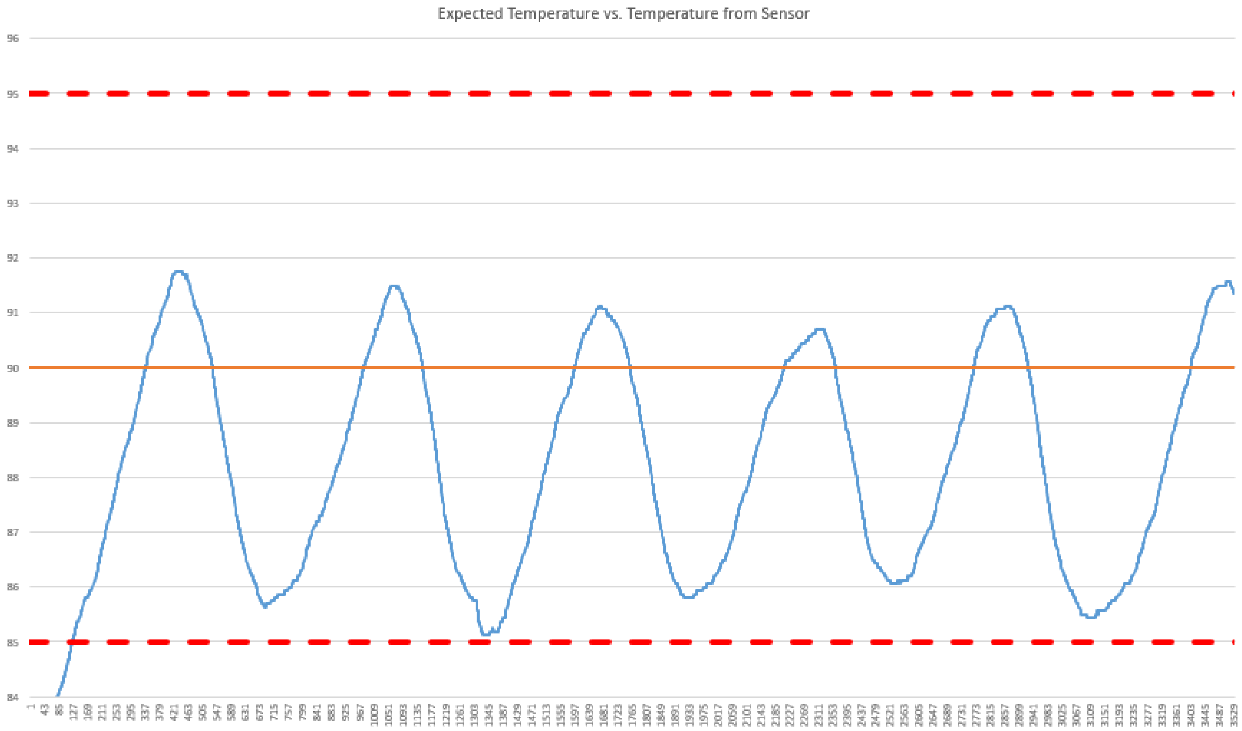

Fig. 1. Graph of Expected Temperature vs Temperature Obtained From Sensors

Code

```
/*********************************
 / DS18B20 Temperature Libraries
 /*********************************/
#include <OneWire.h>
#include <DallasTemperature.h>
// constants for DS18B20 temp sensor
#define ds18Sig 4
// Setup a oneWire instance to communicate with any OneWire devices
// (not just Maxim/Dallas temperature ICs)
OneWire oneWire(ds18Sig);
// Pass our oneWire reference to Dallas Temperature.
DallasTemperature tempDS18(&oneWire);
int relay = 2;
int ds18Vcc = 3;
int ds18Gnd = 5;
float temp = 0.0;
float tempTarget = 90.0;
void setup() {
 // put your setup code here, to run once:
 Serial.begin(9600);
 pinMode (relay, OUTPUT);
 pinMode (ds18Vcc, OUTPUT);
 pinMode (ds18Gnd, OUTPUT);
 pinMode (ds18Sig, INPUT);
 digitalWrite(ds18Vcc, HIGH);
 digitalWrite(ds18Gnd, LOW);
}
void loop() {
 temp = readTempDS18();
 Serial.print (tempTarget);
 Serial.print (" ");
 Serial.print (temp);

 //HEAT UP
 if (temp < tempTarget) {
   Serial.println(" HEAT");
   digitalWrite (relay, HIGH);
   delay(100);
   digitalWrite (relay, LOW);
   delay(50);
 }

 //COOL DOWN
 else if (temp > tempTarget) {
   Serial.println(" COOL");
   digitalWrite (relay, LOW);
   delay(100);
 }


 // read the temperature


}
float readTempDS18() {
 tempDS18.requestTemperatures();
 delay(150);
 return tempDS18.getTempCByIndex(0);
}
```