Mini Projects and Laboratory Report

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1.1 List of user task performed:

- Measuring the real time temperature.
- Displaying temperature in Celsius, Kelvin and Fahrenheit.
- Displaying the maximum and minimum temperature.

1.2 List of Files.

- temp_sensor.bin (main)
- main.cpp
- N5110.cpp
- N5110.h

1.3 Software Modules

- Main
    - temp_range
- N5510

1.4 Function in each module

Main

Read_LM35_Display

- Input – analogue readings to decode(in voltage) ; parameter; float.
  (Convert readings to Celsius, Kelvin and Fahrenheit.)
- Output – buffer; local variable; Result displayed (Float)

Temp_range(maximum temperature and minimum temperature)

- Input – analogue reading from LM35; parameter; Float.
- Output – saved in array; parameter; Float

2.Code

```
#include "mbed.h"
#include "N5110.h"

AnalogIn lm35(p15);
N5110 lcd(p7,p8,p9,p10,p11,p13,p21); // VCC, SCE, RST, D/C, MOSI, SCLK, LED.
DigitalIn button1(p26); // push button's input

float temp_range();
void init_buttons();
LocalFileSystem fs("fs");
static float a[2];
int main() {
while(1)
{
    lcd.init();
    init_buttons();
    float vol;
    float temp;
    float fahrenheit;
    float kelvin;

    lcd.refresh();
    char buffer[14];
    while(button1 == 1)
    {
       temp_range();
       sprintf(buffer,"Max =%.2f C",a[1]);
       lcd.printString(buffer,0,0);

       sprintf(buffer,"Min =%.2f C",a[0]);
       lcd.printString(buffer,0,1);

       lcd.refresh();
       wait(1.0);
       lcd.clear();
       }

    vol = 3.3f * lm35.read();
    temp = 100.0f*vol;
    fahrenheit = ((9*(temp/5))+ 32);
    kelvin = (temp + 273.15);

    lcd.printString("Temprature is : ",0,0);
    sprintf(buffer,"T =%.2f C",temp);
    lcd.printString(buffer,0,1);

    sprintf(buffer,"F =%.2f F",fahrenheit);
    lcd.printString(buffer,0,2);

    sprintf(buffer,"K=%.2f K", kelvin);
    lcd.printString(buffer,0,3);
    lcd.refresh();
    wait(2.0);
    lcd.clear();
    }
```

```
}
float temp_range()
   {
    float a2[100];
    for (int i = 0; i<=100; i++)
        { a2[i] = lm35.read();
         }
       float Minimum_value = a2[1];
       float Maximum_value = 0;
       for (int k = 1; k<=100; k++)
         {  if (a2[k] > a2[k-1])
           { if(Maximum_value < a2[k])
           {
              Maximum_value = a2[k];
              continue;
           }
               }
          else if (a2[k] ==  a2[k-1])
          {
             if (a2[k] > Maximum_value)
             { Maximum_value = a2[k];
             }
             else if (a2[k] < Minimum_value)
               {
                 Minimum_value = a2[k];
               }
          }
          else if (a2[k] < Minimum_value)
          {Minimum_value = a2[k];
           }
           else
            continue;
           }
          a[1] = 3.3f * Maximum_value;
       a[1] = 100.0f* a[1];
       a[0] = 3.3f * Minimum_value;
       a[0] = 100.0f* a[0];
       return 0;
   }
 void init_buttons()
{
    button1.mode(PullNone);
}
```

3 Project Images

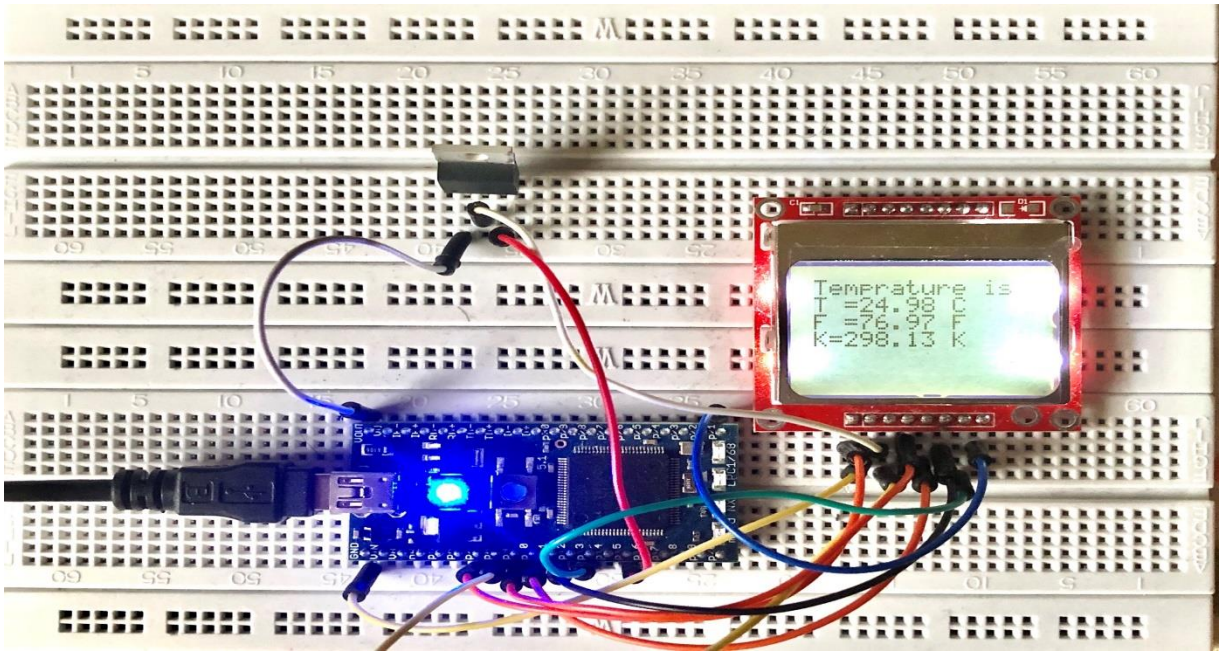

Figure 1

Figure 2

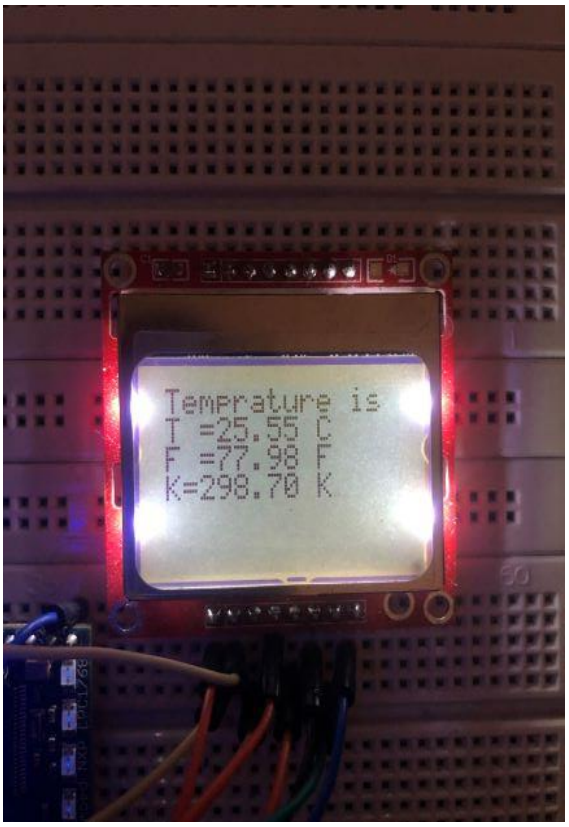

Figure 3