

崑山科技大學 109 學年度第一學期嵌入式系統期末專題報告

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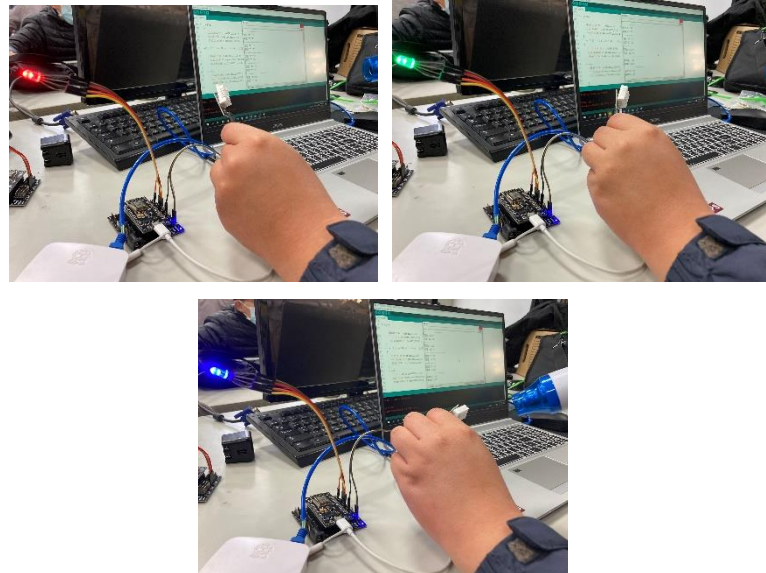
壹、專題摘要

將 DH22 溫濕度上傳到 Raspberry Pi 資料庫內，NodeMCU 同時需要讀取資料庫的溫度，以此溫度值控制 LED 的顏色，28 度以下顯示藍燈，28~40 度顯示綠燈，40 度以上顯示藍燈，截圖說明實作過程。

貳、實作內容

1. 撰寫並燒錄 Arduino 程式碼進到 nodemcu，程式碼內有辨識溫度，透過 LED 變色

```
76 if (t<28)
77 {
78     digitalWrite(redLED,LOW); //點亮共陽型紅燈
79     digitalWrite(greenLED,LOW); //滅掉綠燈
80     digitalWrite(blueLED,HIGH);
81 }
82 else if(t >= 28 & t < 40) //若 濕度未大於80%，則
83 {
84     digitalWrite(redLED,LOW); //滅掉紅燈
85     digitalWrite(greenLED,HIGH); //點亮綠燈
86     digitalWrite(blueLED,LOW);
87 }
88 else{
89     digitalWrite(redLED,HIGH); //滅掉紅燈
90     digitalWrite(greenLED,LOW); //點亮綠燈
91     digitalWrite(blueLED,LOW);
92 }
93 }
```



2. 撰寫 php 程式碼，內有透過溫度變數分辨溫度後，顯示顏色

```
4070E021@raspberrypi: /var/www/html
GNU nano 3.2 show.php
foreach ($db->query($sql) as $row) {
    $Temp = $row["Temp"];
    if($row["Temp"]<28)
    {
        $row["color"] = "BLUE";
    }
    elseif($row["Temp"]>=28 & $row["Temp"]<40)
    {
        $row["color"] = "GREEN";
    }else{
        $row["color"] = "RED";
    }
}

echo "<tr>";
echo " <td>".$row["ID"]."</td>";
echo " <td>".$row["Temp"]."</td>";
echo " <td>".$row["Humidity"]."</td>";
echo " <td>".$row["color"]."</td>";
echo " <td>".$row["Time"]."</td>";

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell ^_ Go To Line
```

3. 查看 Raspberry Pi 資料庫內溫溼度數據

```
4070E021@raspberrypi: ~  
+-----+  
| 847 | 27.10 | 42.10 | 2021-01-14 15:31:12 |  
| 848 | 26.80 | 42.10 | 2021-01-14 15:31:16 |  
| 849 | 26.90 | 42.50 | 2021-01-14 15:31:19 |  
| 850 | 26.70 | 42.70 | 2021-01-14 15:31:23 |  
| 851 | 26.60 | 42.90 | 2021-01-14 15:31:26 |  
| 852 | 26.60 | 43.10 | 2021-01-14 15:31:29 |  
| 853 | 26.40 | 43.30 | 2021-01-14 15:31:33 |  
| 854 | 26.30 | 43.50 | 2021-01-14 15:31:36 |  
| 855 | 26.30 | 43.80 | 2021-01-14 15:31:39 |  
| 856 | 24.60 | 43.00 | 2021-01-14 15:31:42 |  
| 857 | 25.80 | 44.10 | 2021-01-14 15:31:46 |  
| 858 | 26.00 | 44.50 | 2021-01-14 15:31:49 |  
| 859 | 25.90 | 44.70 | 2021-01-14 15:31:52 |  
| 860 | 25.80 | 48.70 | 2021-01-14 15:31:56 |  
| 861 | 25.70 | 47.80 | 2021-01-14 15:31:59 |  
| 862 | 26.00 | 47.50 | 2021-01-14 15:32:02 |  
| 863 | 25.60 | 46.70 | 2021-01-14 15:32:06 |  
| 864 | 25.50 | 46.90 | 2021-01-14 15:32:09 |  
| 865 | 25.40 | 46.80 | 2021-01-14 15:32:13 |  
| 866 | 25.30 | 47.90 | 2021-01-14 15:32:17 |  
+-----+  
66 rows in set (0.00 sec)  
MariaDB [S4070E021]>
```

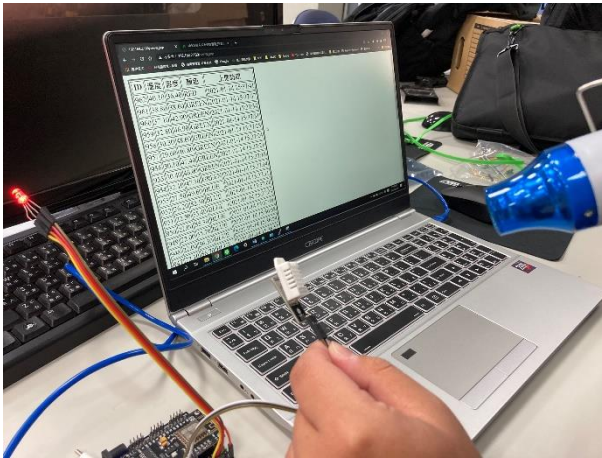
4. 查看網頁依照溫度大小顯示顏色

ID	溫度	濕度	顏色	上傳時間
845	27.40	41.80	BLUE	2021-01-14 15:31:05
844	27.40	41.60	BLUE	2021-01-14 15:31:02
843	27.60	41.50	BLUE	2021-01-14 15:30:58
842	27.60	41.30	BLUE	2021-01-14 15:30:55
841	27.80	41.30	BLUE	2021-01-14 15:30:52
840	28.00	41.30	GREEN	2021-01-14 15:30:48
839	28.00	41.20	GREEN	2021-01-14 15:30:45
838	27.80	40.90	BLUE	2021-01-14 15:30:42
837	28.30	41.30	GREEN	2021-01-14 15:30:38
836	28.50	40.80	GREEN	2021-01-14 15:30:35
835	28.30	39.50	GREEN	2021-01-14 15:30:32
834	29.60	40.10	GREEN	2021-01-14 15:30:28
833	28.90	39.20	GREEN	2021-01-14 15:30:25
832	29.10	39.10	GREEN	2021-01-14 15:30:22
831	28.90	38.70	GREEN	2021-01-14 15:30:19
830	29.40	38.70	GREEN	2021-01-14 15:30:15
829	29.50	38.50	GREEN	2021-01-14 15:30:12
828	29.70	38.50	GREEN	2021-01-14 15:30:09
827	29.90	38.40	GREEN	2021-01-14 15:30:05
826	29.90	37.70	GREEN	2021-01-14 15:30:02

叁、成果展示

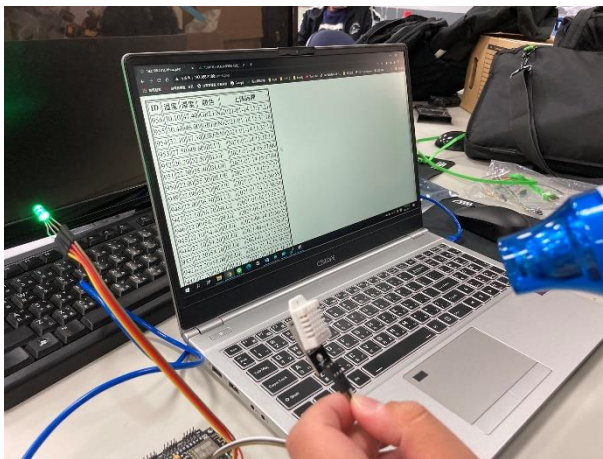
展示不同溫度，有不同顯示的變化

1. 紅色(>40°C)



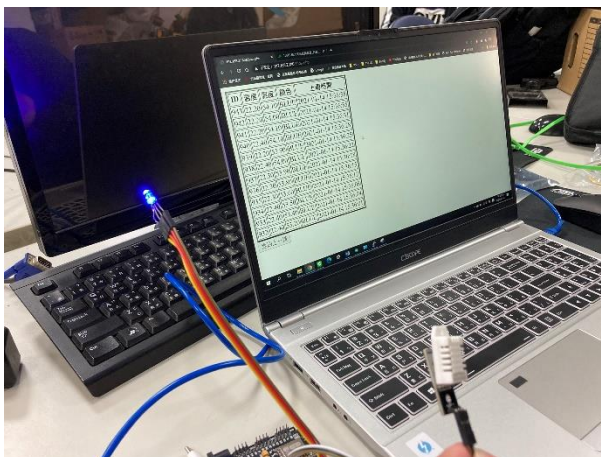
969	40.20	31.60	RED	2021-01-14 15:38:04
968	40.80	31.90	RED	2021-01-14 15:38:01
967	41.50	32.10	RED	2021-01-14 15:37:57
966	42.70	32.10	RED	2021-01-14 15:37:54
965	44.90	32.60	RED	2021-01-14 15:37:51
964	44.30	34.50	RED	2021-01-14 15:37:47
963	40.90	35.60	RED	2021-01-14 15:37:44
962	40.10	36.40	RED	2021-01-14 15:37:41

2. 綠色(>=28°C、<40°C)



961	38.80	38.60	GREEN	2021-01-14 15:37:37
960	37.10	42.90	GREEN	2021-01-14 15:37:34
959	32.80	46.90	GREEN	2021-01-14 15:37:31
958	30.30	48.60	GREEN	2021-01-14 15:37:28
957	29.60	46.80	GREEN	2021-01-14 15:37:24
956	30.10	47.40	GREEN	2021-01-14 15:37:21
955	30.40	46.00	GREEN	2021-01-14 15:37:18
954	32.10	47.30	GREEN	2021-01-14 15:37:14

3. 藍色(<28°C)



953	27.50	49.60	BLUE	2021-01-14 15:37:11
952	26.20	52.50	BLUE	2021-01-14 15:37:08
951	22.30	55.40	BLUE	2021-01-14 15:37:04
950	22.00	55.30	BLUE	2021-01-14 15:37:01
949	22.00	55.70	BLUE	2021-01-14 15:36:58
948	22.00	56.30	BLUE	2021-01-14 15:36:54
947	22.10	56.70	BLUE	2021-01-14 15:36:51
946	22.00	54.70	BLUE	2021-01-14 15:36:48