

ADVANCED EMBEDDED SOFTWARE DEVELOPMENT (AESD)

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DATE: 10th April 2019

HOMEWORK #5

- **GitHub Repository:** <https://github.com/omraheja/Advanced-Embedded-Software-Development-ECEN-5013-002>
- **Screenshots of UART terminal on HOST machine Showing log output of both tasks:**

```
(TEMPERATURE):(TIMESTAMP: 0 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 100 LED COUNT = 1 NAME:Om Raheja
(LED) : (TIMESTAMP: 200 LED COUNT = 2 NAME:Om Raheja
(LED) : (TIMESTAMP: 300 LED COUNT = 3 NAME:Om Raheja
(LED) : (TIMESTAMP: 400 LED COUNT = 4 NAME:Om Raheja
(LED) : (TIMESTAMP: 500 LED COUNT = 5 NAME:Om Raheja
(LED) : (TIMESTAMP: 600 LED COUNT = 6 NAME:Om Raheja
(LED) : (TIMESTAMP: 700 LED COUNT = 7 NAME:Om Raheja
(LED) : (TIMESTAMP: 800 LED COUNT = 8 NAME:Om Raheja
(LED) : (TIMESTAMP: 900 LED COUNT = 9 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 1000 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 1000 LED COUNT = 10 NAME:Om Raheja
(LED) : (TIMESTAMP: 1100 LED COUNT = 11 NAME:Om Raheja
(LED) : (TIMESTAMP: 1200 LED COUNT = 12 NAME:Om Raheja
(LED) : (TIMESTAMP: 1300 LED COUNT = 13 NAME:Om Raheja
(LED) : (TIMESTAMP: 1400 LED COUNT = 14 NAME:Om Raheja
(LED) : (TIMESTAMP: 1500 LED COUNT = 15 NAME:Om Raheja
(LED) : (TIMESTAMP: 1600 LED COUNT = 16 NAME:Om Raheja
(LED) : (TIMESTAMP: 1700 LED COUNT = 17 NAME:Om Raheja
(LED) : (TIMESTAMP: 1800 LED COUNT = 18 NAME:Om Raheja
(LED) : (TIMESTAMP: 1900 LED COUNT = 19 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 2000 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 2000 LED COUNT = 20 NAME:Om Raheja
(LED) : (TIMESTAMP: 2100 LED COUNT = 21 NAME:Om Raheja
(LED) : (TIMESTAMP: 2200 LED COUNT = 22 NAME:Om Raheja
(LED) : (TIMESTAMP: 2300 LED COUNT = 23 NAME:Om Raheja
(LED) : (TIMESTAMP: 2400 LED COUNT = 24 NAME:Om Raheja
(LED) : (TIMESTAMP: 2500 LED COUNT = 25 NAME:Om Raheja
(LED) : (TIMESTAMP: 2600 LED COUNT = 26 NAME:Om Raheja
(LED) : (TIMESTAMP: 2700 LED COUNT = 27 NAME:Om Raheja
(LED) : (TIMESTAMP: 2800 LED COUNT = 28 NAME:Om Raheja
(LED) : (TIMESTAMP: 2900 LED COUNT = 29 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 3000 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 3000 LED COUNT = 30 NAME:Om Raheja
(LED) : (TIMESTAMP: 3100 LED COUNT = 31 NAME:Om Raheja
(LED) : (TIMESTAMP: 3200 LED COUNT = 32 NAME:Om Raheja
(LED) : (TIMESTAMP: 3300 LED COUNT = 33 NAME:Om Raheja
(LED) : (TIMESTAMP: 3400 LED COUNT = 34 NAME:Om Raheja
(LED) : (TIMESTAMP: 3500 LED COUNT = 35 NAME:Om Raheja
(LED) : (TIMESTAMP: 3600 LED COUNT = 36 NAME:Om Raheja
(LED) : (TIMESTAMP: 3700 LED COUNT = 37 NAME:Om Raheja
(LED) : (TIMESTAMP: 3800 LED COUNT = 38 NAME:Om Raheja
(LED) : (TIMESTAMP: 3900 LED COUNT = 39 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 4000 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 4000 LED COUNT = 40 NAME:Om Raheja
(LED) : (TIMESTAMP: 4100 LED COUNT = 41 NAME:Om Raheja
(LED) : (TIMESTAMP: 4200 LED COUNT = 42 NAME:Om Raheja
(LED) : (TIMESTAMP: 4300 LED COUNT = 43 NAME:Om Raheja
(LED) : (TIMESTAMP: 4400 LED COUNT = 44 NAME:Om Raheja
(LED) : (TIMESTAMP: 4500 LED COUNT = 45 NAME:Om Raheja
(LED) : (TIMESTAMP: 4600 LED COUNT = 46 NAME:Om Raheja
(LED) : (TIMESTAMP: 4700 LED COUNT = 47 NAME:Om Raheja
(LED) : (TIMESTAMP: 4800 LED COUNT = 48 NAME:Om Raheja
(LED) : (TIMESTAMP: 4900 LED COUNT = 49 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 5000 TEMP DATA: 27.146
(LED) : (TIMESTAMP: 5000 LED COUNT = 50 NAME:Om Raheja
(LED) : (TIMESTAMP: 5100 LED COUNT = 51 NAME:Om Raheja
(LED) : (TIMESTAMP: 5200 LED COUNT = 52 NAME:Om Raheja
(LED) : (TIMESTAMP: 5300 LED COUNT = 53 NAME:Om Raheja
(LED) : (TIMESTAMP: 5400 LED COUNT = 54 NAME:Om Raheja
(LED) : (TIMESTAMP: 5500 LED COUNT = 55 NAME:Om Raheja
(LED) : (TIMESTAMP: 5600 LED COUNT = 56 NAME:Om Raheja
(LED) : (TIMESTAMP: 5700 LED COUNT = 57 NAME:Om Raheja
(LED) : (TIMESTAMP: 5800 LED COUNT = 58 NAME:Om Raheja
(LED) : (TIMESTAMP: 5900 LED COUNT = 59 NAME:Om Raheja
(TEMPERATURE):(TIMESTAMP: 6000 TEMP DATA: 28.246
(LED) : (TIMESTAMP: 6000 LED COUNT = 60 NAME:Om Raheja
(LED) : (TIMESTAMP: 6100 LED COUNT = 61 NAME:Om Raheja
```

UART Terminal showing the logs from both temperature task as well as LED task. The on-board LED (D1 and D2) blink every 100ms and the temperature is sent to the logger task every 1 second.

- Screenshot of UART terminal showing alert [Extra Credit]:

```

[TEMPERATURE]:[TIMESTAMP]: 100000    TEMP DATA: 29.90    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100000    LED COUNT = 1000    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100100    LED COUNT = 1001    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100200    LED COUNT = 1002    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100300    LED COUNT = 1003    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100400    LED COUNT = 1004    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100500    LED COUNT = 1005    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100600    LED COUNT = 1006    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100700    LED COUNT = 1007    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100800    LED COUNT = 1008    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 100900    LED COUNT = 1009    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 101000    TEMP DATA: 29.90    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101000    LED COUNT = 1010    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101100    LED COUNT = 1011    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101200    LED COUNT = 1012    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101300    LED COUNT = 1013    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101400    LED COUNT = 1014    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101500    LED COUNT = 1015    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101600    LED COUNT = 1016    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101700    LED COUNT = 1017    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101800    LED COUNT = 1018    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 101900    LED COUNT = 1019    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 102000    TEMP DATA: 31.34    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102000    LED COUNT = 1020    NAME:Om Raheja
[ALERT]       :TEMPERATURE OUT OF RANGE    LED COUNT = 1021    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102200    LED COUNT = 1022    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102300    LED COUNT = 1023    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102400    LED COUNT = 1024    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102500    LED COUNT = 1025    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102600    LED COUNT = 1026    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102700    LED COUNT = 1027    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102800    LED COUNT = 1028    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 102900    LED COUNT = 1029    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 103000    TEMP DATA: 31.34    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103000    LED COUNT = 1030    NAME:Om Raheja
[ALERT]       :TEMPERATURE OUT OF RANGE    LED COUNT = 1031    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103200    LED COUNT = 1032    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103300    LED COUNT = 1033    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103400    LED COUNT = 1034    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103500    LED COUNT = 1035    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103600    LED COUNT = 1036    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103700    LED COUNT = 1037    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103800    LED COUNT = 1038    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 103900    LED COUNT = 1039    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 104000    TEMP DATA: 30.190    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104000    LED COUNT = 1040    NAME:Om Raheja
[ALERT]       :TEMPERATURE OUT OF RANGE    LED COUNT = 1041    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104200    LED COUNT = 1042    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104300    LED COUNT = 1043    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104400    LED COUNT = 1044    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104500    LED COUNT = 1045    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104600    LED COUNT = 1046    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104700    LED COUNT = 1047    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104800    LED COUNT = 1048    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 104900    LED COUNT = 1049    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 105000    TEMP DATA: 30.190    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105000    LED COUNT = 1050    NAME:Om Raheja
[ALERT]       :TEMPERATURE OUT OF RANGE    LED COUNT = 1051    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105200    LED COUNT = 1052    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105300    LED COUNT = 1053    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105400    LED COUNT = 1054    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105500    LED COUNT = 1055    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105600    LED COUNT = 1056    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 105700    LED COUNT = 1057    NAME:Om Raheja

```

The UART terminal shows an alert message when the temperature crosses 30 degree Celsius.

The below screenshot shows that the Alert message disappears as soon as the temperature falls below the threshold value.

```

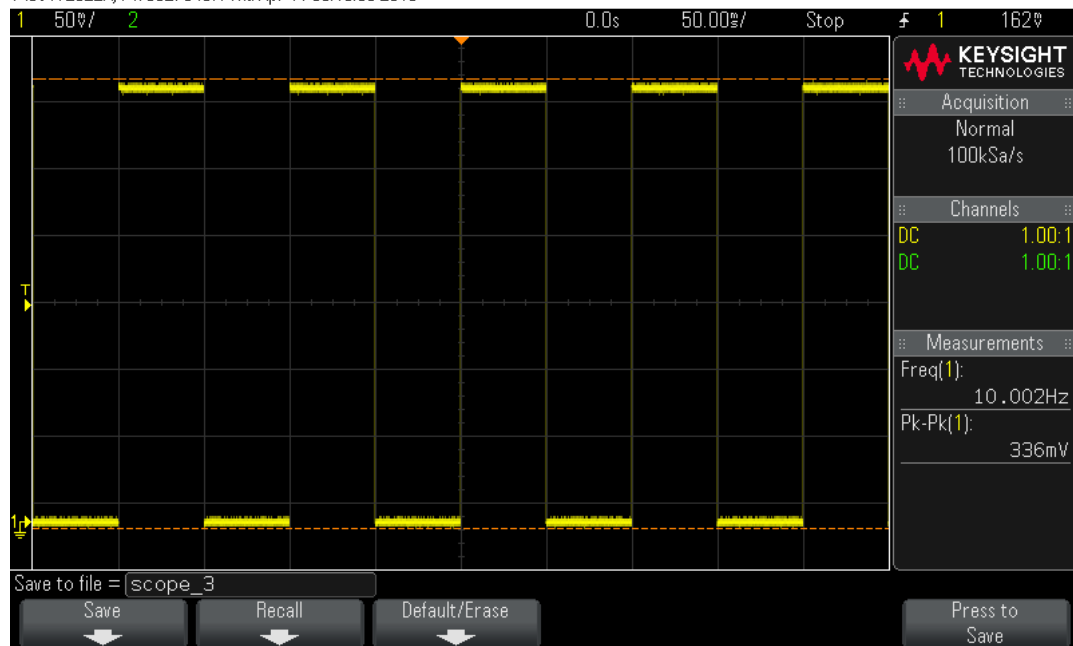
[TEMPERATURE]:[TIMESTAMP]: 435000    TEMP DATA: 31.34    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435000    LED COUNT = 4350    NAME:Om Raheja
[ALERT]       :TEMPERATURE OUT OF RANGE    LED COUNT = 4351    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435100    LED COUNT = 4352    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435200    LED COUNT = 4353    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435300    LED COUNT = 4354    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435400    LED COUNT = 4355    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435500    LED COUNT = 4356    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435600    LED COUNT = 4357    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435700    LED COUNT = 4358    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435800    LED COUNT = 4359    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 435900    LED COUNT = 4360    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 436000    TEMP DATA: 29.90    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436000    LED COUNT = 4361    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436100    LED COUNT = 4362    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436200    LED COUNT = 4363    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436300    LED COUNT = 4364    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436400    LED COUNT = 4365    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436500    LED COUNT = 4366    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436600    LED COUNT = 4367    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436700    LED COUNT = 4368    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436800    LED COUNT = 4369    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 436900    LED COUNT = 4370    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 437000    TEMP DATA: 29.90    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437000    LED COUNT = 4371    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437100    LED COUNT = 4372    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437200    LED COUNT = 4373    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437300    LED COUNT = 4374    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437400    LED COUNT = 4375    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437500    LED COUNT = 4376    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437600    LED COUNT = 4377    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437700    LED COUNT = 4378    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437800    LED COUNT = 4379    NAME:Om Raheja
[LED]         :[TIMESTAMP]: 437900    LED COUNT = 4380    NAME:Om Raheja
[TEMPERATURE]:[TIMESTAMP]: 438000    TEMP DATA: 29.90

```

- **Oscilloscope Screenshot of LED toggling at the required frequency (10 Hz):**

D1 LED:

MSO-X 2022A, MY56270407: Thu Apr 11 05:19:05 2019



D2 LED:

MSO-X 2022A, MY56270407: Thu Apr 11 05:19:20 2019

