

EN2853: Embedded Systems and Applications

Programming Assignment 1

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Index No: XXXXX

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This is an individual exercise!
Due Date: 4 May 2023 by 11.59 PM

Instructions

During weeks 2 and 3 of the course, we discussed microcontroller programming and how to create a Medibox using an ESP32 to remind users to take their medicine on time. Your task is to create a fully-functioning simulation of the Medibox on Wokwi. You can refer to the demonstration done during week 3. Your simulation should include the following functionality.

1. A menu that provides the following options.
 - (a) Set time zone by taking the offset from UTC as input.
 - (b) Set 3 alarms.
 - (c) Disable all alarms.
2. Fetch the time in the selected time zone from the NTP server over Wi-Fi. Display the current time on the OLED.
3. Ring the alarm with proper indication when the set alarm times have been reached.
4. Stop the alarm using a push button.
5. Monitor temperature and humidity levels and provide warnings using proper indication when either or both temperature and humidity have exceeded healthy limits.

Note: Healthy Temperature : $26^{\circ}\text{C} \leq \text{Temperature} \leq 32^{\circ}\text{C}$

Note: Healthy Humidity : $60\% \leq \text{Humidity} \leq 80\%$

Following the same methods shown in the week 3 demonstration is NOT mandatory. You are free and encouraged to explore other programming techniques to satisfy the above functionality. Use suitable indications to ring the alarm and to provide warnings. A few examples of such indications are as follows.

- Buzzer
- LED
- Message on OLED

Marking Rubric

This assignment accounts for 25% of your final grade. The marks allocation for the required functionality is as follows.

Table 1: Marks Allocation.

Criteria	Allocated Marks
Fetching the current time from the NTP server and displaying on OLED	20%
Entering and navigating the menu	10%
Setting time zone	10%
Setting three alarms	10%
Ringling an alarm with proper indication and stopping an alarm	20%
Disabling all alarms	10%
Displaying warnings if temperature or humidity has exceeded healthy levels	10%
Creativity and neatness	10%

Submission

Submit your Wokwi project as a .zip file through Moodle.