EN2853: Embedded Systems and Applications Programming Assignment 1

Name: John Doe
Index No: XXXXX

April 28, 2023

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 °C $\leq$ Temperature $\leq$ 32 °C

   Note: Healthy Humidity : 60% $\leq$ 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 20% 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%
Ringing 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.