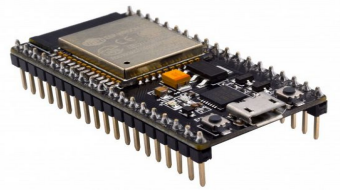
ELP 720 Telecom Networks Laboratory

Assignment #5 - ESP32 with Arduino IDE
11 February 2020



General Instructions

- While coding, take care of proper indentation and put comments appropriately
- **Flowcharts should be made using tikz package only.** The final picture of your hardware (if any) should be put in the report
- Every submission should be done on moodle
- ***Any kind of plagiarism related to reports/proposals/codes will not be tolerated and will be heavily penalized***
- Proper citations are necessary
- Create a folder named '<entry no>_<assign no>' eg - 2019JTMxxxx_nn. The files should also be named in the standard format as the folder, where 'xxxx' is 4 digits of entry number while 'nn' is assignment number
- This folder should contain the src code, pdf and tex file of LaTeX report
- Deadlines: 11 Feb 2020, **1700hrs** (software and hardware completion); **1800hrs** (Report submission)
- **No requests will be taken in case of miss in submission. Zero will be awarded for no submission**

In this assignment, we will use ESP32 to send remote data, using the Blynk application.
After you complete this assignment, your ESP32 will be able to send any sensor data directly to your mobile app.

Problem Statement

The concept of Smart Homes has made our living spaces more interactive and responsive to the needs of users. The Home automation concept covers a wide range of functionality right from operating your lightings, your home security, easy opening of your garage doors, instant availability of coffee as and when you need it and almost everything that comes across your daily activities.
Let us design our own Home Automation device using Mobile App and Google Assistant!

Your Home automation app should be designed in such a way, that you can control two electrical appliances, monitor the temperature of your home and monitor the power consumed by these electrical appliances

- Connect your ESP32 with the IITD Wifi

- You have limited "Energy" in the Blynk app, so use it carefully according to your assignment.

- The app must perform the following things:
    - Control 2 appliances using Buttons and Google Assistant and read the status of appliances using led widget on the app.
      Note: Use LEDs instead of electrical appliances and led widget shows the status of electrical appliances not the button status

    - Display the reading of the temperature (in ℃)
      Note: Use touch sensor as the temperature sensor is not available

    - Display the total power consumed by these appliances (consider one LED is consuming 9-11 watt of power while the other is consuming 19-21 watt of power)
    - **Note:** Consider float value to represent power

    - Calculate the total power consumption cost (convert to watt-hour for this)
      Note: 1 unit = 1 watt-hour and
      each unit costs Rs. 100 (very expensive)

- If temperature value is greater than the threshold value, you get email alerting you regarding the rise in temperature.
  Note: Choose threshold value using a slider in the app (slider makes the threshold value variable in the app)

Submission:

- Assignment Report must include the following sections:
  - Problem Statement
  - Equipment Required
  - Assumptions (specify pin connections)
  - Algorithm/Implementation
  - Flowchart
  - Screenshots
  - Difficulty Faced
  - Appendix (include code)
  - References

- Only the submitted code will be evaluated. Any changes in the code after the submission will not be considered.