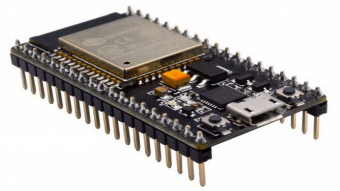
ELP 720 Telecom Networks Laboratory

Assignment #4 - ESP32 with Arduino IDE
28 January 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: 28 Jan 2020, **1700hrs** (software and hardware completion); **1745hrs** (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 telegram application. After you complete this assignment, your ESP32 will be able to send any sensor data directly to your mobile phone. You will also be able to tell your ESP32 to perform some action, remotely

Problem Statement

A weather station is a device that collects data related to the weather and environment using many different sensors. Weather stations are also called weather centres, personal weather stations, professional weather stations, home weather station, weather forecaster and forecasters
Let us design our own weather station!

- Connect your ESP32 to **IITD_WIFI**
- Create your own Telegram bot which can communicate with ESP32
- From this bot, you will send a **city name**
- This name will be received by your weather station (i.e. ESP32)
- And the weather information for this city is obtained by the station from **OpenWeatherMap API** server
- As a reply to the query of the bot, weather station should send the weather conditions like Temperature in degree Celsius, Humidity, Pressure and Status (Haze, Smog, Rain, Clear, etc.) of that city
- Display the same weather information on the LCD connected to ESP32
- If the station has no requests to respond to (**idle state**), it is indicated with the help of **Blue** colour of RGB LED
- As soon as the station receives any request, RGB LED should turn **Green** till the request gets served
- Whenever someone tries to touch your server (esp32) you should get notified on Telegram bot that someone is trying to alter the server and a **separate LED** must be turned on as an indication alarm!
  Bonus: Now, you want to do some repair work in your station and you have to allow a technician to access your weather station. You should be able to turn off this feature remotely so that you won't get a notification when that technician touches the server until you turn it on again

Do the proper error handling wherever required!