PROJECT 3
Automotive Door Control System Design
<u>Static Design</u>

Project Requirements

- Hardware requirements:

       Two microcontrollers connected via CAN bus
       One Door sensor (D)
       One Light switch (L)
       One Speed sensor (S)
       ECU 1 connected to D, S, and L, all input devices
       Two lights, right (RL) and left (LL)
       One buzzer (B)
       ECU 2 connected to RL, LL, and B, all output devices

- Software requirements:

       ECU 1 will send status messages periodically to ECU 2 through the CAN protocol
       Status messages will be sent using Basic Communication Module (BCM)
       Door state message will be sent every 10ms to ECU 2
       Light switch state message will be sent every 20ms to ECU 2
       Speed state message will be sent every 5ms to ECU 2
       Each ECU will have an OS and application SW components
       If the door is opened while the car is moving → Buzzer ON, Lights OFF
       If the door is opened while the car is stopped → Buzzer OFF, Lights ON
       If the door is closed while the lights were ON → Lights are OFF after 3 seconds
       If the car is moving and the light switch is pressed → Buzzer OFF, Lights ON
       If the car is stopped and the light switch is pressed → Buzzer ON, Lights ON

You should draw and deliver the system schematic (Block Diagram) according to your requirements understanding, a screenshot is required

Static Design Analysis

- For ECU 1:

1. Make the layered architecture
2. Specify ECU components and modules
3. Provide full detailed APIs for each module as well as a detailed description for the used typedefs
4. Prepare your folder structure according to the previous points

- For ECU 2:

1. Make the layered architecture
2. Specify ECU components and modules
3. Provide full detailed APIs for each module as well as a detailed description for the used typedefs
4. Prepare your folder structure according to the previous points

You should deliver a pdf file containing all your work and a video recording where you will discuss your work (maximum 3min long)