First Time Behind the Wheel !

Target:

Learn about:

- Digital I/O Fundamentals
- GPIO Hardware and Architecture
- Voltage Levels and Electrical Characteristics
- Practical Interfacing
- Microcontroller System Integration

Resources:

1. [Embedded Systems Diploma](#)   from 012 - 015
2. [Hardware Peripherals FWD](#)   01 Introduction to AVR ATmega32   (all videos)
                                   03 DIO Programming (till video no. 18)

How to submit your task:

- Push your task on GitHub on your repository named **IEEE-ZSB RAS-Embeddded 2025**.
- Watch [video-1](#) or [video-2](#) to know how to do this.
- Create a folder named **Task13** contains your task and the video.

Evaluation:

- Code (15 points)
- Schematic (5 points)
- Video (5 points)

Deadline:

6 Days   **#Saturday 2 August at 23:59**

What To Do:

1. **Design** and **simulate** a complete schematic of the Traffic Light System in Proteus, including the three traffic LEDs (Red, Yellow, Green) and a two-digit 7-segment counter implemented using multiplexing techniques.
   - **The traffic light timing logic:**
     15 seconds for STOP (Red LED).
     5 seconds for READY (Yellow LED).
     10 seconds for GO (Green LED).

2. **Driver Development:**
As part of this task, you are required to develop your own drivers from scratch to control the hardware components involved in the traffic light system.
   - **In your code try to make each driver in a separate .c/.h file.**
   - **Use constants/macros for pin numbers and LED colors for readability.**
   - **Ensure you're using low-level register access**

3. **Implement** and **test** your custom GPIO and display driver code within the simulation on proteus.

4. **Ensure** that the multiplexing logic displays correct countdown values on the 7-segment displays without visible flickering.

What You Should Submit:

- **Code Files: Include all source and header files**
- **Proteus Simulation file**
- **2-3 minutes video demonstrating and explaining your project, include working simulation and the structure of your code.**

Create your TASK based on your Thinking & Creativity and you will have 5 bonus