Embedded Challenge Fall 2020
Term Project
“Embedded Fitness” Challenge

Objective:

The COVID pandemic has forced almost all gyms to close until further notice. Because of this, many of us have become sedentary and are suffering from lack of sufficient exercise causing fatigue and obesity creating the need for new exercising options. The objective of this semester’s embedded challenge is to use the data collected from a single accelerometer (on your microcontroller board) to record body movements to identify one of 4 exercises:

- Situps
- Pushups
- Jumping Jacks
- Squats

- The device must be able to detect all 4 exercises and can be placed anywhere on the body.
- You must use some indication method (4 LEDs?) to specify that a specific exercise has occurred and must keep count for all four exercises.
- You must program a fixed workout routine, 15 repetitions of each exercise for example. There must be some indication of the workout progress and if it has been “completed”.
- Be creative and use the LEDs, buttons, etc. in a way that makes the user interface friendly and useful.

Restrictions:

- This is an individual project to be done independently by each student.
- Only one microcontroller and one accelerometer/MPU may be used.

- The PlatformIO programming environment must be used.
- You will be allowed to use any drivers/HAL functions available through the IDE

Grading Criteria:

- Ability to successfully achieve the objectives (40%) (Submit source code)
- Repeatability and robustness of function (via video demo) (30%)
- Ease of use (10%)
- Creativity (10%)
- Well written code (10%)