RTOS In A Nutsel

short line

# **Challenge**

# Sprint number (1)

## User story (1):

Use an existing RTOS project to create a single task with periodicity 1000ms, the task shall toggle an LED at the rate of its periodicity.

## User story (2):

Use an existing RTOS project to build a simple advertising panel, the panel shall consist of 3 LEDs and 1 LCD display. The 3 LEDs shall toggle at different rates, 100ms, 500ms, and 1000ms respectively. The LCD shall display random text from a pre-defined text array of size 10 (texts), the text displayed shall be switched every 1500ms.

## User story – BONUS (3):

Port the FreeRTOS directly from the official release and construct an RTOS project from scratch then use this project to build a simple switch ON/OFF application using an LED and a push button. When the push button is pressed the LED turns ON as long as the switch is pressed, otherwise the LED is turned OFF.

## Group members number (1, 2 or 4):

* User story (1) & (2) require 1 person only.
* User story – BONUS (3) requires 2 persons.

## SW/HW input environment:

TivaC - Development board.

## Test (If exists):

NA

## Restrictions (peripherals, configurations, what to use and not to use):

1. All applications implemented in this sprint shall use two type of tasks. An **init task** that comes only once to initialize all required interfaces. A **cyclic task** that comes on a fixed period to execute a certain logic.
2. In this challenge LEDs, LCDs, and push buttons are considered individual and independent objects that should have its own task to handle its logic (ex. A task for LCD – A task for LED – A task for another LED – Etc...). A single task shall not handle two objects of the same category.
3. Driver for LCDs and push buttons shall completely be developed by the student and is allowed only to use the GPIO driver from the TivaWare library.
4. In this sprint configure RTOS **configTICK\_RATE\_HZ** to 1000 HZ, and disable preemption.