EMBEDDED LAB PROJECT

PROBLEM STATEMENT:

To create a system that tracks room occupancy using an LED ring that indicates the room's status. When someone leaves, a 15-minute timer starts to allow for cleaning. Once the timer finishes, a light signals that the room is clean and ready to use again.

SOLUTION:

· **Switches as Input**:

- **SW1 (PF4)**: Acts as the "Enter" button. When pressed, it indicates that someone has entered the room.
- **SW2 (PF0)**: Acts as the "Exit" button. When pressed, it indicates the room is now vacant and starts a 15-minute cleaning countdown.
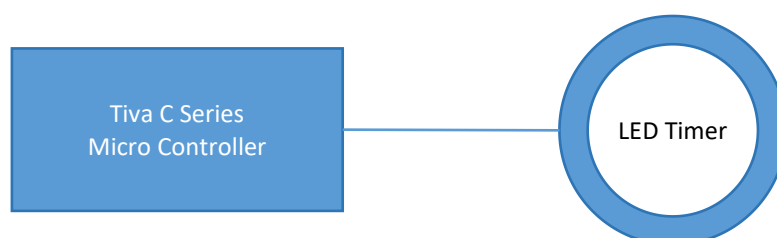
· **LED Ring Behavior**:

- **Occupied (Red)**: SW1 press lights the LED ring in **red**.
- **Vacant & Cleaning (Blue)**: SW2 press initiates a 15-minute countdown, turning the LED ring **blue**.
- **Available (Green)**: After the timer expires, the LED ring turns **green** to show the room is ready.

· **Reset Condition**:

- If SW1 is pressed while the countdown is active, the room status resets to "Occupied" (red) and stops the cleaning timer.

BLOCK DIAGRAM:

FLOWCHART:

START

Wait for button press

SW1 Button Pressed

SW2 Button Pressed

Set LED to RED

Start 15 min timer

Room in use

LED Countdown (LED = Blue)

Yes

If SW1 pressed

No

Timer Expires

Set LED to Green

STOP