Control & Automation Engineering Department

# KON309E Microcontroller Systems

Experiment 3

Aim: Finite state machine design and coding for traffic light control application by using external interrupts.

In this experiment, participants are expected to achieve tasks given below.

1. Construct a circuit consisting of 3 LEDs (red, yellow, green) and a button as shown in Figure 1 (You can use the circuit you constructed in Experiment 2).

2. Design a finite state machine (FSM) according to given instructions.
    -   When the button is **NOT** pressed, the traffic light operates in the sequence:
        10 seconds red -> 2 seconds yellow -> 10 seconds green -> 2 seconds yellow …

    -   If a pedestrian presses the button while the light is **green**, the light jumps to yellow and continues to operate in the given sequence.

    -   Pressing the button when the light is yellow or red has no effect.

3. Control your circuit by coding your FSM design.

Please pay attention to the following:

-   Use external interrupt for the button pressed event.
-   You can use switch case structure for coding the state machine.
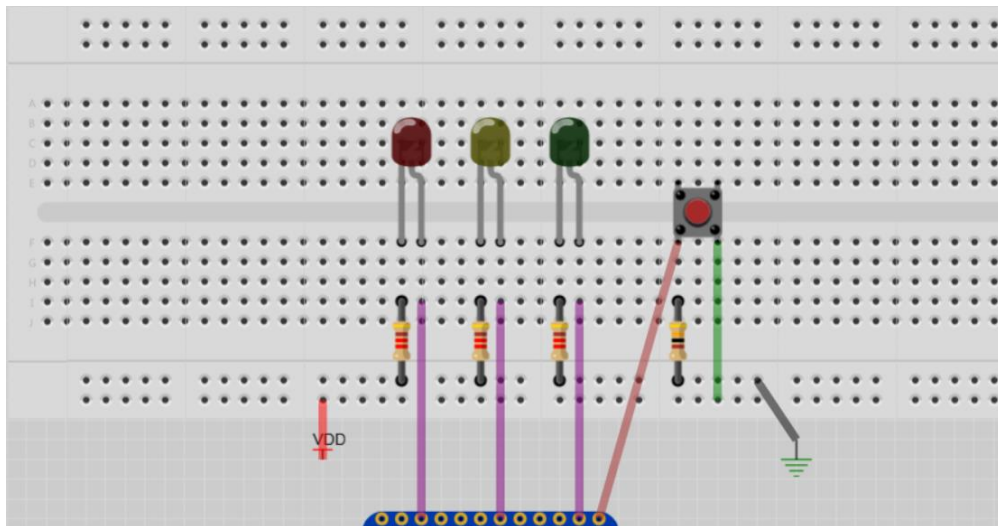
Figure 1: Wiring diagram for LEDs and button.

The deadline for the report is **01.12.2020**.

Please consider the following steps when preparing your reports.

1. Describe the experiment **in your own words**.
2. Add your main codes as screen shots.
   - Don't forget to comment your codes **in your own words** explaining how each line of code works.
3. Add a photo of your whole circuit.
4. Take a video of your system while running, upload it on YouTube, Drive, etc. and include the link on your report.