Control & Automation Engineering Department

KON309E Microcontroller Systems

Experiment 2

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

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.
2. Design a finite state machine (FSM) according to given instructions.
   - When button is **pressed**, all three LEDs will be **ON**.
   - When button is **released**, LEDs start to blink in the order of red->yellow->green.
   - When button is **pressed** while LEDs are blinking, all three LEDs will be **ON**.
   - When button is **released**, all LEDs will be **OFF**.
3. Control your circuit by coding your FSM design.

Please pay attention to the following:

- The blinking period is 0.5 seconds.
- Use 10kΩ pull down resistor for button and 100Ω resistors for LEDs.
- Long leg of LEDs is the anode.
- Connect V_{DD} and Ground pins of microcontroller to the breadboards (+) and (–) sockets.
- You can use switch case structure for coding the state machine.

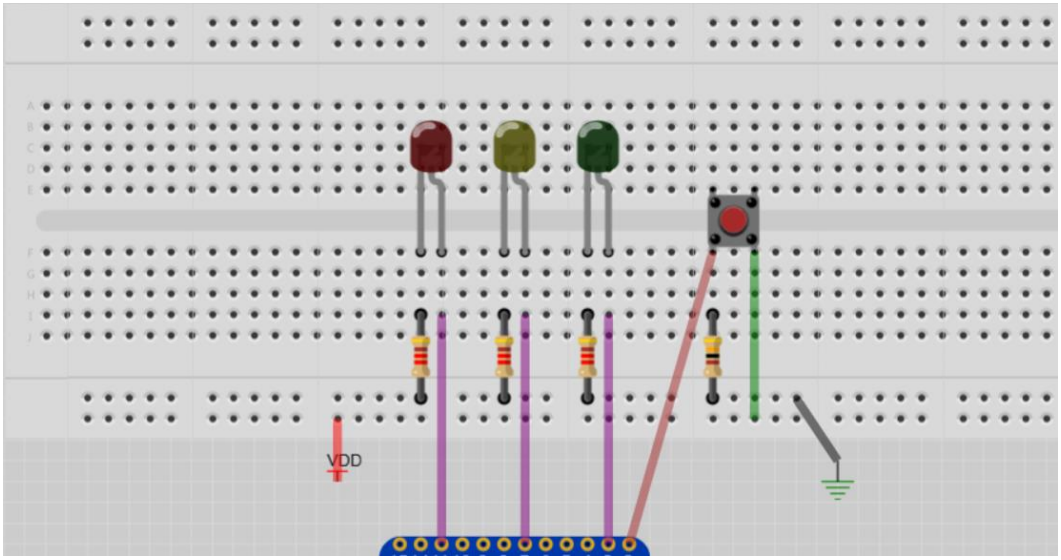

Figure 1 : Wiring diagram for LEDs and button.

The deadline for the report is **24.11.2020**.

Please consider the following steps when preparing your reports.

1. Describe the experiment **in your own words**.
2. Add your main codes.
   - 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 for us.