

## LAB 2: I/O INTERFACE, INTERRUPT FUNCTION OF ARM

### A. OBJECTIVE:

1. To familiarize yourself with the MINI-V3 Development Board.
2. To understand the basic input/output of the microcontroller.
3. To understand the difference of polling and interrupt.

### B. PRE-LAB ASSIGNMENT:

1. Watch the Video 1 – Part I : Development Environment from the course Canvas.
2. Watch the Video 2 : Intro to CubeIDE from the course Canvas.
3. Study the information about MINI-V3 Development Board from the course Canvas.
4. Study the Tutorial for LAB2.

### C. LAB SETUP DETAILS

1. Follow the Video 1 – Part II : Blink, generate a BLINK Project for Task 1 using CubeIDE.
2. According to the information from Tutorial for LAB2, generate a LAB2 project for Task 2 and 3 using CubeIDE.

### D. EXPERIMENT

In this LAB, there are 3 tasks.

**Task 1 – Generate a BINKING LED Project using CubeIDE.**

**Task 2 – Implementation of the polling I/O**

In the while(1) loop of main.c, implement a polling method that using External Key to toggle the RGB LED in order.

**Task 3 – Implementation of the interrupted I/O**

Modify the stm32f1xx\_it.c, implement an interrupt driven method that will toggle the external LED when K1 is pressed.

### E. PROCEDURE

**Task 1 – Generate a BINKING LED Project using CubeIDE**

Follow the Video 1 – Part II : Blink, generate a blinking LED on PB.5.

Show your Task 1 result to TA

*For Task 2 and Task 3, we will be using one RGB LED, K1 button from the MINI-V3 Development Board, one external LED and one external Key. Please refer to Tutorial for LAB2 for information.*

**Task 2 – Implementation of the polling I/O**

In the while(1) loop of main.c, implement a polling method that using External Key to toggle the RGB LED in order.

Show your Task 2 result to TA

### **Task 3 – Implementation of the interrupt I/O**

In main.c, and modify the stm32f10x\_it.c, implement an interrupt driven method that will toggle the external LED when K1 is pressed.

Modify the function so that whenever K1 is pressed, the External LED will toggle.

Show your Task 3 result to TA

Rebuild, download the run your program. Verify that when you pressing K1, the External LED will toggle. At the same time, your Task 2 Code should still work. (i.e. pressing the External Key will toggle the RGB LED in order)