COMP9032 Lab 3

Oct. 2020

1. Objectives

In this lab, you will learn AVR programming on

- Input from keypad, and
- Output to LED and LCD

2. Preparation

- Read through the document LCD_Manual.pdf for general description of Dot Matrix LCD.
- Discuss with group members on how to complete the lab task.

3. Task (10 marks, due **your lab session in week 7**)

Write an assembly program that performs multiplication: *a* = *b* x *c*, where *a*, *b*, *c* are all unsigned 1-byte integers. The program takes *b* and *c* from the keypad and displays the result on the LCD. When there is an overflow in the calculation, the LED bar flashes 4 times.

Note: you can use the "*" key for "*x*" and the "#" key for "=". For example, to get 12*x*9, your input key sequence is 1→2→*→9→#.

Assemble your program using Atmel Studio, and run it on the AVR Microcontroller Board. Demonstrate your work to the lab assessor.

Assessment: The task will be accessed based on both **overall group work** and **individual presentation** during the demonstration which is split into

1) One member demonstrates your group work with the lab board;
2) Other members each explain part of your assembly code.

Your marks of this lab consist of 70% from the overall group work and 30% from your individual presentation. All members have the same group marks.