COMP9032 Experiment 3

Oct. 2019

1. Objectives

In this lab, you will learn AVR programming on

- Input from keyboard, and
- Output to LCD

2. Preparation

- Read through the document available at www.cse.unsw.edu.au/~cs9032/references/Documents/LCD_Manual.pdf for general description of Dot Matrix LCD.
- Read through the task description of this experiment, and write your programs at home in order to finish the experiment on time.

3. Task (15 marks, for week 6, due in week 8, 33% bonus for early completion)

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 3 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 AVR Studio, and run it on the AVR Microcontroller Board. Demonstrate your working program to the lab assessor.

Note:

- As before, your program should be well commented. Up to 4 marks will be deducted for not providing proper and sufficient comments.
- Early completion will receive 33% bonus mark. Namely, if you complete the task and have your work marked in your Week 7 lab class, you can earn up to 20 marks for this task.