EECE416 Microcomputer Fundamentals Dr. Charles Kim

Assignment 4 (100 points) – ARM Coding Assignment

A. Problems

1. Write a function which, for a word size (8-dgit hexadecimal) number passed in r2, separates and stores each digit of the number in a memory the starting address of which is passed in r3, highest digit in the lowest address.

2. Write a function which, for a given decimal number (0 – 9) passed in r2, generates and returns in r0 a number whose bit pattern with '1's forms a bar (made by '1') chart-like shape with the count of bars the same as the decimal number. Example is provided below. Use the lookup table approach.

Input r2	Output r0	[in binary representation]
1	0x00000001	0b00000000000000000000000000000001
3	0x00000007	0b00000000000000000000000000000111
7	0x0000007F	0b00000000000000000000000001111111

3. Write a complete code which displays a bar chart (as explained in 2 above) for each digit of your Howard ID, calling above 2 functions and, in order to see the changes in the LED pattern, the 1sec-delay function. This is the only code to submit.

B. Coding instruction

(i) Write a code for #3 which includes #1 and #2 as functions in it.
(ii) Add comments which sufficiently explain your coding design, allocation of registers to variables, etc.
(iii) Do not get help from others. Write your own code yourself. Remember "Howard student code of conduct" and 0 point for borrowed and lending works.

C. Score Distribution and Scoring Rubric: Total points = 100

	Rubric
100 pts	Code is written with comments which sufficiently indicate the coding design, register allocation, and variable declaration. The code works.
70 pts	Code is written with minimal amount comments which thus insufficiently indicate the coding design. However, the code works.
40 pts	Code is written with comments which sufficiently indicate the coding design, but it does not work.
0 pts	(a) No submission. (b)If two codes are almost identical with same register allocation and/or the same order of code sequence, etc.

D. Submission Requirement: Write your code in the CPUlator and test it, and save the code file as **416Assign4_*yourLastName*4.s**. Submit the code file via email.

E. Submission due: Check the Webpage

F. Point Deduction on Late Submission (or **Maximum score by submission time**)

Submission Time/Date	Maximum score
By 5:00pm submission date (Fri)	100
By 5:00pm submission date + 3 (Mon)	70
By 5:00pm submission date + 4 (Tue)	50
By 5:00pm submission date + 5 (Wed)	30
After the above	0