

## **Homework 2 Due: Monday 9/22 Class (turn one piece of paper)**

**1) Read the textbook sections 3.3.1- 3.3.5, and 3.3.7**

**2) Review Lec3.ppt**

The purpose of this homework is to review Lab 1 and Lec3.

You are allowed to work in groups of 2 on homework. *Each student must turn in their own solution.* If you will miss class you are allowed to turn in homework to your professor before class. To get credit for homework you must complete all questions, but the official score will be completion. I.e., we will not check the answers. However, the professors have answers to the homework, so if you are uncertain about your answers go to their office hours to check your answers against the solution key. We will NOT post the answers.

***Exercises are activities you should do, but will not turn in. Assignments will be turned in.***

**Exercise 2.1:** Complete checkpoints 3.1, 3.4, and 3.6 in the book chapter 3. Write your answer first then look in the back of the book to see the answer.

**Exercise 2.2:** How is the stack pointer (SP) initialized on the ARM?

**Exercise 2.3:** What does the SP point to?

**Exercise 2.4:** What are the two steps (in order) that occur during a stack push?

**Exercise 2.5:** What are the two steps (in order) that occur during a stack pop?

**Exercise 2.6.** To use an I/O pin as a UART function, to what value to we set its corresponding AFSEL bit?

**Assignment 2.1:** Give the correct assembly instruction to perform the following operations. Each operation will be one load or store instruction.

a) Read a 16-bit signed number into Register R8, assuming R0 already points to the memory location from which we wish to read.

b) Read an 8-bit unsigned number into Register R9, assuming R1 already points to the memory from which we wish to read.

c) Write an 8-bit signed number from Register R10 to memory, assuming R2 already points to the memory location to which we wish to write.

d) Write a 16-bit unsigned number from Register R11 to memory, assuming R3 already points to the memory location to which we wish to write.

**Assignment 2.2:** Assume N is a 32-bit global variable defined in RAM. Write assembly code to set bit 3 and clear bit 29 of N (Note: bits are numbered from 0:LSB to 31:MSB).

**Assignment 2.3:** Draw the circuits that interface a positive logic switch to Port A pin 7 and, a negative logic switch to Port A pin 0.

**Assignment 2.4:** Draw the circuit that interfaces a positive-logic LED to Port A pin 6. The LED parameters are 1.2V 1mA. Assume the microcontroller output voltage  $V_{OH}$  is 3.2V.