

Homework 0 Due: Wednesday 9/3 in Class
(turn in this paper to the TA during class)

Read all of the EdX module Chapter 2, (you can skim section 2.8)

http://users.ece.utexas.edu/~valvano/Volume1/E-Book/C2_FundamentalConcepts.htm

Assignment 0.1: Fill in the letter that specifies the definition for each word. (Definitions on next page)

Computer	ROM	microcontroller
Arithmetic logic unit (ALU)	Instruction set architecture (ISA)	ADC
basis	embedded computer system	Hardware port
bus	Real time	Halfword
R13	R14	R15
byte	Big endian	Little endian
Serial port	Parallel Port	Device driver

Assignment 0.2: Compare memory on LC3 and on the ARM. Fill in this table

	How many memory locations are there?	How many bits are stored at each address?
LC3		
ARM Cortex M		

Assignment 0.3: Each row of the following table is to contain an equal value expressed in binary, hexadecimal, and decimal. Complete the missing values. Assume the decimal values are unsigned. The first row illustrates the process.

binary	hexadecimal	decimal
2_01101001	0x69	105
	0x48	
		49
2_11001110		
	0xF5	

Assignment 0.4: Each row of the following table is to contain an equal value expressed in binary, hexadecimal, and decimal. Complete the missing values. Assume each value is 8 bits and the decimal numbers are signed. The first row illustrates the process.

binary	hexadecimal	decimal
2_01011110	0x5E	94
	0xB2	
		-76
2_11000011		

Definitions for assignment 0.1 (please do not turn this page in)

- A** Memory that is nonvolatile and contains machine instructions (code)
- B** Component of the processor that performs arithmetic and logic operations.
- C** Mechanism for storing multiple byte numbers such that the least significant byte exists first (in the smallest memory address).
- D** Mechanism for storing multiple byte numbers such that the most significant byte exists first (in the smallest memory address).
- E** Link register containing the return address when calling a function (subroutine).
- F** A set of digital signals that connect the CPU, memory and I/O devices, consisting of address signals, data signals and control signals. See also address bus, control bus and data bus.
- G** A register in the processor that points to the memory containing the instruction to execute next.
- H** Digital information containing 8 bits.
- I** A single chip microcomputer like the Texas Instruments TM4C123, Freescale 9S12, Intel 8051, Intel 8096, PIC16, or the Texas Instruments MSP430.
- J** A physical/electrical mechanism for data to flow into or out of the microcontroller
- K** Stack pointer.
- L** A description of a processor that details the machine code, the instruction set, addressing modes, and how data are accessed.
- M** A system that performs a specific dedicated operation where the computer is hidden inside the machine.
- N** Input/output with many bits sent at the same time.
- O** Input/output that sends one bit at a time.
- P** Digital information containing 32 bits.
- Q** An electronic device that converts analog signals (e.g., voltage) into digital form (i.e., integers).
- R** Digital information containing 64 bits.
- S** Includes a processor, RAM, ROM, and I/O ports.
- T** Digital information containing 16 bits.
- U** A system can guarantee a worst case upper bound on the response time between when the new input information becomes available and when that information is processed..
- V** A condition where information is lost when power is removed.
- W** A subset from which linear combinations of the elements can be used to construct the entire set.
- Y** a set of software functions that facilitate the use of an I/O port.
- Z** 1024 bytes or 8192 bits, abbreviated KiB.