EECE.3170: Microprocessor Systems Design I

Summer 2017

Homework 1

Due **1:00 PM**, **Thursday, 5/18/17**

Notes:

- While typed solutions are preferred, handwritten solutions are acceptable.
- Any electronic submission must be in a single file. Archive files will not be accepted.
- Electronic submissions should be e-mailed to Dr. Geiger at Michael_Geiger@uml.edu.
- This assignment is worth 100 points.

1. (50 points) Given each of the binary or hexadecimal number below, determine what the decimal value is if the number is (i) an unsigned integer, and (ii) a signed integer. Note that, in some cases, your answers for both will be the same.

a. 01011000_2
b. 11001011_2
c. 0x93—recall that the leading 0x signifies the following value is in hexadecimal
d. 0x51A3
e. 0xDAB0

See the next page for Question 2.

2. (50 points) Assume the contents of memory are shown below. All values are in hexadecimal. The table shows four bytes per line; the given address is the starting address of each line.

   Each block in the table contains a single byte, with the low and high bytes per line indicated as shown. Each byte has its own address, so the byte at address 0x92220 is 0x89, address 0x92221 is 0xAE, address 0x92222 is 0xE1, and address 0x92223 is 0xF4.

   You should assume all multi-byte values are stored in little-endian format.

Address	Lo			Hi
0x92220	89	AE	E1	F4
0x92224	15	BA	FF	70
0x92228	31	CE	EE	23
0x9222C	19	78	01	06
0x92230	15	12	24	07
0x92234	B3	A2	99	DA
0x92238	44	20	C5	B6

For each address and amount of data listed, answer the following:

- What data are stored at that address?
- Would an access to the given amount of data at that address be aligned?
- If the data represents a signed integer, what is the sign of that value?

For example, given "Address: 0x92220, Data size: word," your response would be that the word at 0x92220 is 0xAE89, the access is aligned, and the data represents a negative integer.

a. Address: 0x9222C, Data size: word

b. Address: 0x92235, Data size: byte

c. Address: 0x9222B, Data size: double word

d. Address: 0x92236, Data size: word

e. Address: 0x92227, Data size: double word