Due at the start of class Wednesday, October 8, 2003.

**Problem 1.** Assume you have a (32 bit) register that stores the four letter word "word" (where each letter is eight bits). Assume you execute an instruction to store the word starting at byte $1483_{10}$.

(a) Assume the machine uses big endian to store values. Show the characters in locations 1483 to 1486.

(b) Assume the machine uses little endian to store values. Show the characters in byte locations 1483 to 1486.

**Problem 2.**

(a) Assume your machine stores a word by putting the high order bit of the word in the high order bit of the first byte of the memory location, the second to high order bit of the word in the second to high order bit of the first byte of the memory location, etc., and thereby finishes by putting the low order bit of the word in the low order bit of the last byte of the memory location. Assume you execute an instruction to store the hexadecimal word "C30AD34E" starting at byte $3729_{10}$. Show the values in byte locations 3729 to 3732 using hexadecimal.

(b) Assume your machine stores a word by putting the low order bit of the word in the high order bit of the first byte of the memory location, the second to low order bit of the word in the second to high order bit of the first byte of the memory location, etc., and thereby finishes by putting the high order bit in the low order bit of the last byte the location. Assume you execute an instruction to store the hexadecimal word "C30AD34E" starting at byte $3729_{10}$. Show the values in byte locations 3729 to 3732 using hexadecimal.

**Problem 3.** Assume you have an unsigned number stored in variable W that represents eight 4-bit (or hexadecimal) characters. Give C (or C++) code using the bit operations (and, or, xor, not, shift) to reverse the order of the eight characters.

**Problem 4.** Assume you have a variable X that represents an ASCII character. Give C (or C++) code using the bit operations to change the case of X, so a lower case character becomes upper case and an upper case character becomes lower case.