16.216: ECE Application Programming
Fall 2012

Lecture 7: Key Questions
September 19, 2012

1. (Review) Describe the C bitwise operators.

2. Explain C bit shift operators and their uses.

3. What is the order of operations for C operators?

4. **Example:** Evaluate each of the following expressions if you have the following
   unsigned ints: `A = 7, B = 10, and C = 0xFFFFFFFF`

a. `A & B`

b. `A | ~B`

c. `A ^ C`

d. `A << 4`

e. `B >> 5`

f. `A | (B << 2)`

5. **Example:** Given an unsigned int, n, and a number, b, how would you:
a. Clear all bits of n?

b. Clear the lower 16 bits of n (mask out lower bits)?

c. Flip all bits of n?

d. Flip bit b of n?

e. Set bit b of n (i.e., make sure bit b is 1)?

f. Clear bit b of n (i.e., make sure bit b is 0)?

6. Describe how, in general, you perform the operations below on a bit or range of bits:
a. Setting bit(s) (desired bit(s) = 1, all others unchanged)

b. Clearing bit(s) (desired bit(s) = 0, all others unchanged)

c. Flipping bit(s) (desired bit(s) change from 0→1 or 1→0, all others unchanged)