

16.216: ECE Application Programming

Summer 2013

Lecture 9: Key Questions August 8, 2013

1. Describe the C bitwise operators.
2. Explain C bit shift operators and their uses.

3. **Example:** Evaluate each of the following expressions if you have the following unsigned int variables: $A = 7$, $B = 10$, and $C = 0xFFFFFFFF$
- a. $A \& B$

b. $A \mid \sim B$

c. $A \wedge C$

d. $A \ll 4$

e. $B \gg 5$

f. $A \mid (B \ll 2)$

a. Clear all bits of n?

c. Flip all bits 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)?

5. 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 $0 \rightarrow 1$ or $1 \rightarrow 0$, all others unchanged)

6. Describe how to extract a group of bits from a larger value.

7. Describe how to print hexadecimal values.