Quiz 2

19 February 2013

You have up to 25 minutes. You may use a calculator, but no text book, notes, or network.

1. **Use the hexadecimal codes in the right column to fill in the 8×8 icon grid, assuming 1 bit per pixel.**
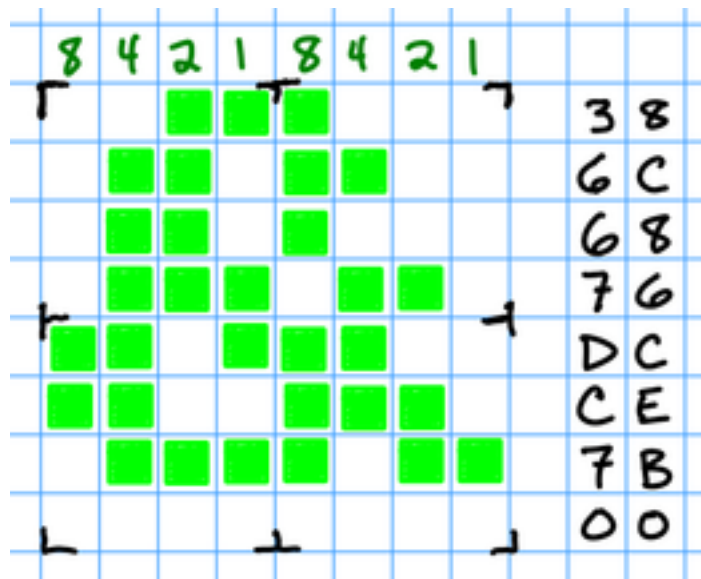

Figure 1:

It's an ampersand ('and' symbol) from an 8×8 pixel font.

2. **If an image uses 5 bits per pixel, what is the maximum number of colors it can contain?**
   With 5 bits per pixel, we can have 2^5 colors, and $2^5 = 32$.

3. **Suppose you work for a CPU manufacturer that has exhausted its supply of XOR gates. Show whether or not the expression $A \cdot B' + A' \cdot B$ is equivalent to $A \oplus B$ by completing a truth table of all possible values of inputs A and B.**
   They are the same. Below is the truth table that proves it. You do not need to write the circuit diagram shown above the table – that's just a convenient way to show how each column is calculated.
   Recall that XOR is a way to say "not equal to." Its result is true when A and B are *different*.
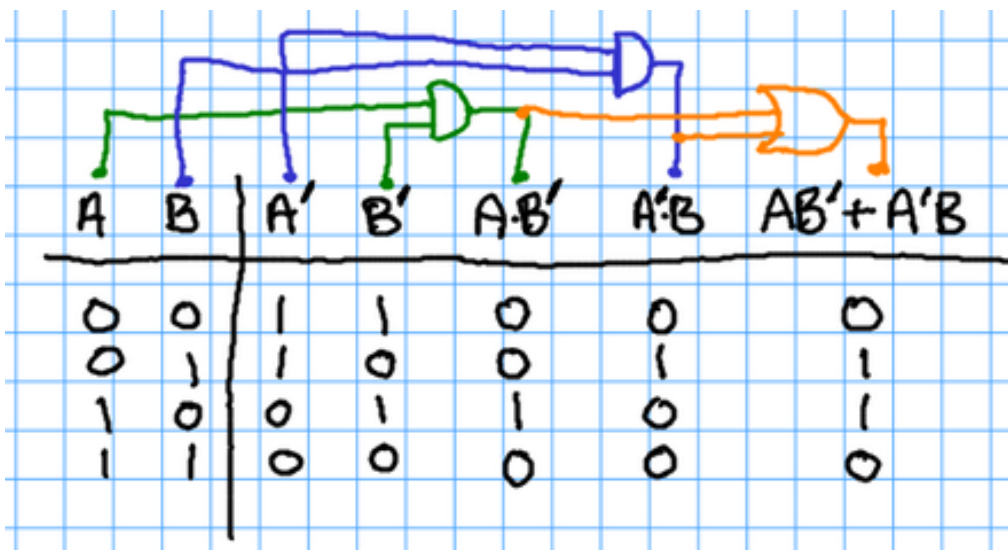
A	B	A′	B′	A·B′	A′·B	AB′ + A′B
0	0	1	1	0	0	0
0	1	1	0	0	1	1
1	0	0	1	1	0	1
1	1	0	0	0	0	0

Figure 2: Truth table