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CE-1900 - Dr. Durant - Quiz 1
Fall 2015, Week 1

1. (1 point) What is a key difference between interpreting analog and digital voltage signals?

*analog is continuous (infinite # of levels) + more susceptible to noise
digital is discrete (finite # of levels, for only 2) + thus
less susceptible to noise*

2. (1 point) What is 2^0 as a decimal number?

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3. (2 points) Write all the 4-bit unsigned numbers in both binary and decimal.

0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	10
1011	11
1100	12
1101	13
1110	14
1111	15

4. (2 points) List/calculate the powers of 2 from 2^3 to 2^9 as decimal numbers.

2^3 2^4 2^5 2^6 2^7 2^8 2^9

5. (1 point) Convert 101011 from binary to decimal. Show your work.

$$\begin{array}{r}
 16 \quad 4 \\
 32 \quad 8 \quad 2 \quad \leftarrow \text{add} \\
 \hline
 43_{10}
 \end{array}$$

6. (2 points) Convert 73 from decimal to binary. Show your work.

$$\begin{array}{r}
 2 \overline{)73} \\
 2 \overline{)36} \text{ R } 1 \text{ LSB} \\
 2 \overline{)18} \text{ R } 0 \\
 2 \overline{)9} \text{ R } 0 \\
 2 \overline{)4} \text{ R } 1 \\
 2 \overline{)2} \text{ R } 0 \\
 2 \overline{)1} \text{ R } 0 \\
 \hline
 0 \text{ R } 1 \text{ MSB}
 \end{array}$$

optional separator
 \downarrow
 100_1001

can also use "left to right" method from book

7. (1 point) What is the largest unsigned number that can be represented with 6 bits?

- a. Answer in **decimal** (base 10):

$$\begin{array}{l}
 \cancel{2^6 - 1 = 63} \\
 \cancel{2^7 - 1 = 127}
 \end{array}
 \quad
 2^6 - 1 = 63$$

- b. Answer in **binary** (base 2):

$$111111_2 \quad (= 32 + 16 + 8 + 4 + 2 + 1 = 63)$$

checking