CE2210 Homework 1

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1.

Digital	**Analog**
Computer	Wrist Watch
Smart Phone	Joystick
Keyboard	Thermostat

2. a) $2^2 = 4$
   b) $2^4 = 16$
   c) $2^6 = 64$

3. a) 67,108,864 bits
   b) 8,388,608 bits
   c) 524,288 bits
   d) 1,048,576 bits

4. This representation sets 000 to North moving clockwise around the compass incrementing by 1 for each direction. In order to include NNW, NNE, SSW and SSE a 4-bit word would need to be used because it doubles the amount of possible directions.

Direction	Binary
N	000
NE	001
E	010
SE	011
S	100
SW	101
W	110
NW	111

5. a) $101111_2 = 47_{10}$
   b) $011000_2 = 24_{10}$
   c) $111011_2 = 59_{10}$
   d) $011101_2 = 29_{10}$

6. a) $01110100_2 = 116_{10}$
   b) $11001001_2 = 201_{10}$
   c) $10000010_2 = 130_{10}$

7. a) $125_{10} = 1111101_2$
   b) $153_{10} = 10011001_2$
   c) $212_{10} = 11010100_2$

8. a) $1FB1_{16}$ =0001 1111 1011 $0001_2 = 8,113_{10}$
   b) $0ACC_{16}$ =0000 1010 1100 $1100_2 = 2,764_{10}$
   c) $71F2_{16}$ =0111 0001 1111 $0010_2 = 29,170_{10}$
   d) $70BA_{16}$ =0111 0000 1011 $1010_2 = 28,858_{10}$

9. A 14 bit word is necessary to represent 9999_{10} in binary.