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In-Lab 4

Part 1:

Converting 8.8125 into little endian binary and expressed in hexadecimal.

1. Find the exponent for base 2 that makes the quotient of 8.8125/(2^n) less than 1.
2. Add 127 to 3 to determine the bits for the exponent.
3. Fill in the bits for sign and exponent in IEEE (Big Endian)
   1. **Sign (+) therefore first bit = 0**
   2. **130 = 100 0010**
   3. **First 9 bits = 0100 0001 0**
4. Determine the summation of (1/(2^n)) that equals 0.101562.
   1. **0.101562 =**
   2. **Since 1/2 , 1/4, and 1/8 are all larger than 0.101562, start with 1/16**
5. Fill in the bits for the mantissa
   1. **000 1101 0000 0000 0000 0000**
6. Convert 0100 0001 0000 1101 0000 0000 0000 0000 into Little Endian:
   1. **0000 0000 0000 0000 0000 1101 0100 0001**
7. Convert Little Endian to hex:
   1. **0x00000D81**

Part 2:

Convert 0x00c01ec2 from hex to a floating point number

1. Convert the hexadecimal into binary:
   1. **c = 12, e = 14**
   2. **0000 0000 1100 0000 0001 1110 1100 0010**
2. Convert from Little Endian to Big Endian
   1. **1100 0010 0001 1110 1100 0000 0000 0000**
3. Determine the exponent for the base 2
   1. **100 0010 0 = 132**
   2. **132 – 127 = 5**
   3. **Therefore we know that the mantissa + 1 is multiplied by**
4. Determine the mantissa
   1. **001 1110 1100 0000 0000 0000 0000**
5. Determine the floating point number:
   1. **–(1 + 0.240234375) \* (2^5) = -39.6875**