**Problem 1**. What decimal number does the bit pattern 0x0C000000 represent if it is a floating point number? Use the IEEE 754 standard. Explain in detail how you get your answer.

0x0C000000 = 00001100 | 00000000 00000000 00000000

Sign = 0

Exponent = 00001100 = 12

Actual Exponent = 12-127= -115

Mantissa = 00000000000000000000000

Value = (-1)^0 \* 2^(-115) \* (1+0) = 2^-115

Decimal value = 2.47\*10^-35

**Problem 2**. What is the bit pattern that represents the floating point number with a decimal value of 1.0625? Use the IEEE 754 standard. Explain in detail how you get your answer.

Convert to binary and determine sign bit

1.062510 = 1.00012

Sign bit = 0

Normalize the binary number

1.0001 = 1.0001\*2^0

Calculate the exponent and convert to binary

0+127 = 127

127 = 01111111

Mantissa = 00010000000000000000000 # excluded the leading 1 and then padded with 0s to make it 23 bits long

Bit pattern = 0111 1111 0000 1000 0000 0000 0000 0000

Convert to hexadecimal

Hex = 0x3f100000