

ARCHITECTURE COMPUTER ASSIGNMENT



Arranged by :

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Represent Floating number 32bit from these number :

1. 1110.011101
2. 10000.010001

Answer :

Note : Scientific Notation : $1.xxxxx \times 2^e$ where xxxxxx is the mantissa.

For : 1110.011101

1. Let's normalize this binary number, $1110.011101 = 1.110011101 \times 2^{011}$
2. Biased exponent for IEEE 754 Floating point : $127 + \text{Exponent Bits}$

Exponent bits + Exponent Biased : $011 + 01111111 = 10000010 = 130_{10}$

3. $e = 130_2 - 127_2 = 3_{10}$
4. 0 10000010 110011101000000000000000

The order is : sign,exponent bits,mantissa

m (mantissa) = $110011101000000000000000 = 0.806640625_{10}$

5. Result :

$$(-1)^s \times (1 + m) \times 2^e = 1.806640625_{10} \times 2^3$$

For 10000.010001

1. Let's normalize this binary number, $10000.010001 = 1.0000010001 \times 2^{100}$
2. Biased exponent for IEEE 754 Floating point : $127 + \text{Exponent Bits}$
Exponent bits + Exponent Biased : $100 + 01111111 = 10000011 = 131_{10}$
3. $e = 131_2 - 127_2 = 4_{10}$
4. 0 10000011 000001000100000000000000

The order is : sign,exponent bits,mantissa

$$m = 000001000100000000000000 = 0.0166015625_{10}$$

5. Result :

$$(-1)^s \times (1 + m) \times 2^e = 1.0166015625_{10} \times 2^4$$