

Magic 32-bit floating point number: -38.875

- Sign bit = 1 because number is negative
- Whole number part = 38
 - $38/2 = 19$ remainder 0
 - $19/2 = 9$ remainder 1
 - $9/2 = 4$ remainder 1
 - $4/2 = 2$ remainder 0
 - $2/2 = 1$ remainder 0
 - $1/2 = 0$ remainder 1
 - Result = 100110
- Decimal part = .875
 - $.875 \times 2 = 1.75$ 1
 - $.75 \times 2 = 1.5$ 1
 - $.5 \times 2 = 1$ 1
 - = 0.111

Number = 100110.111
= 1.00110111×2^5

1-bit sign bit = 1

8-bit exponent = $5 + \text{bias of } 127 = 132 = 1000\ 0100$

23-bit Mantissa = 00110111000000000000000

1 1000 0100 00110111000000000000000

1100 0010 0001 1011 1000 0000 0000 0000

0xc21b8000 (big endian)

0x00801BC2 (little endian)

Other number is 0x00401f41 little-endian

Convert to big endian: 411f4000

Expand to decimal: 0100 0001 0001 1111 0100 0000 0000 0000

Sign-bit = 0

8-bit exponent = 1000 0010 – bias of 127 = 0000 0011₂ = 3₁₀

23-bit mantissa = 0011 1110 1000 0000 0000 000

$1.001111101 \times 2^3 = 1001.111101$

$1 \cdot 2^3 + 0 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0 + 1 \cdot 2^{-1} + 1 \cdot 2^{-2} + 1 \cdot 2^{-3} + 1 \cdot 2^{-4} + 0 \cdot 2^{-5} + 1 \cdot 2^{-6}$

$8 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{64}$

9.953125