Encoding 2 page 4

— hex BF B0 00 00 ⟶ binary 1011 1111 1011 0000 0000 0000 0000 0000

regroup 1 0111 1111 011 0000 0000 0000 0000 0000

$s = 1$

$e = 7F_{hex} = 127_{decimal}$

binary scientific $= 1.011 \times 2^{127-127} = 1.011 \times 2^0$

decimal $= 1 + \frac{1}{4} + \frac{1}{8} = 1.375$

$s = 1$ so -1.375

— hex 98 C0 00 00 ⟶ binary 1001 1000 1100 0000 0000 0000 0000 0000

regroup 1 0011 0001 100 0000 0000 0000 0000 0000

$s = 1$

$e = 31_{hex} = 49_{decimal}$

binary scientific $= 1.1 \times 2^{49-127} = 1.1 \times 2^{-78}$

— decimal −35.25 ⟶ double 70.5, 141 ⟶ 2 times

$s = 1$ $= 141 \times 2^{-2}$

↳ convert to binary: 1 → 70, 0 → 4; 0 → 35, 0 → 2; 1 → 17, 0 → 1; 1 → 8 ⟶ 1000 1101 (7 times)

binary scientific $= 1.0001101 \times 2^{-2} \times 2^7 = -1.0001101 \times 2^5$

decimal $= -1.00011\,01 = -100011.01 = -35.25$

(5; 35; 0.25)

IEEE 754 double precision

— decimal −32.0 ⟶ binary $10000 = 1.0 \times 2^5$, as binary scientific $= -1.0 \times 2^5$

↳ f (+ 51 zeroes)

$s = 1$

$5 = e - 1023$; $e = 1028_{decimal} = 404_{hex}$

hex = 1 (e) 100 0000 0100 (f) 52 0's

$= C0\ 4\ 0\ 00\ 00\ 00\ 00\ 00$

$= C0\ 40\ 00\ 00\ 00\ 00\ 00\ 00$