

exercícios do livro [OV]



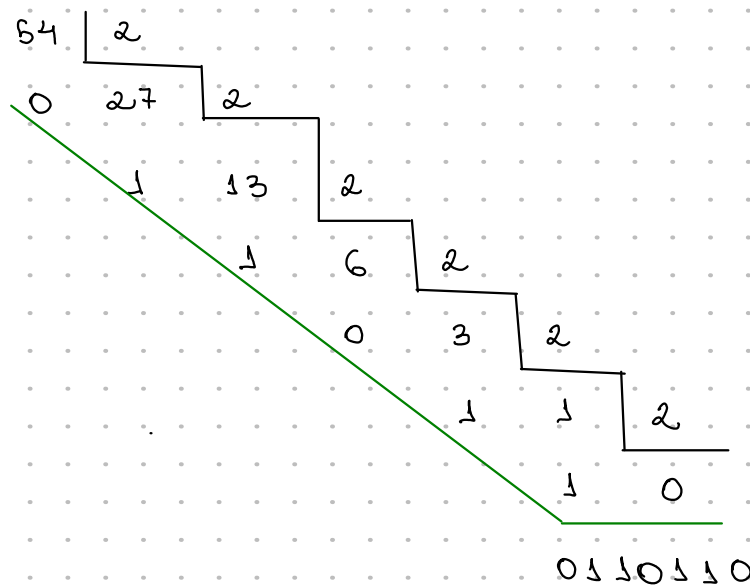
numerical computing with IEEE floating point arithmetic



capítulo 2: the real numbers

Exercise 2.1 Conversion of integers from binary representation to decimal is straightforward, because we are so familiar with the decimal representations of the powers of 2. Devise (or recall) a systematic method to convert the decimal representation of an integer to binary. Which do you find more convenient: determining the bits from left to right, or from right to left? Both methods are acceptable, but once you get the idea, one of them is easier to use systematically than the other. Test your choice on some examples and convert the binary results back to decimal as a check. Does your method extend to convert a finite decimal representation of a nonintegral rational number, such as 0.1, to its binary representation?

determinar da esquerda para a direita é mais conveniente.



<https://pt.planetcalc.com/862/>

calculadora de binário

$$1 \cdot 2^5 + 1 \cdot 2^4 + 0 \cdot 2^3 + 1 \cdot 2^2 + 1 \cdot 2^1 + 0 \cdot 2^0$$

$$= 32 + 16 + 0 + 4 + 2 + 0 = 54$$

esse método não se estende para números com parte fracionária, porém se utiliza outro método que determina da esquerda para a direita.

0,1 em binário

$$0,1 \times 2 = 0,2 \rightarrow 0,0$$

$$0,2 \times 2 = 0,4 \rightarrow 0,00$$

$$0,4 \times 2 = 0,8 \rightarrow 0,000$$

$$0,8 \times 2 = 1,6 \rightarrow 0,0001$$

$$0,6 \times 2 = 1,2 \rightarrow 0,00011$$

$$0,2 \times 2 = 0,4 \rightarrow 0,000110$$

...

sucessivamente

$$0,1 = 0,000110 \dots (2)$$

capítulo 3: computer representation of numbers

Exercise 3.1 Using a 32-bit word, how many different integers can be represented by (a) sign and modulus; (b) 2's complement? Express the answer using powers of 2. For which of these two systems is the representation for zero unique?

a) 0 até $2^{31} - 1$

b) -2^{31} até $2^{31} - 1$

- para o sistema sign and modulus.