Chapter 1 : Summary

Wednesday, January 17, 2024 11:15 AM

three methods for converting one base to another

(1) convert from other base to decimal

expansion method

$13.2_4 = 1\times4^1 + 3\times4^0 + 2\times4^{-1} = 7.5$

(2) convert from decimal to other base

repeated division / multiplication

30.125 → base 4

	Q	R
30 ÷ 4	7	2
7 ÷ 4	1	3
1 ÷ 4	0	1
	stop	

		int	non-int
0.125 × 4	=	0	+ 0.5
0.5 × 4	=	2	+ 0

if doesn't go to zero, look for repeating pattern

answer: 132.02_4

(3) convert between powers of 2 (binary ↔ octal ↔ hexadecimal)

37.26_8 → hexadecimal

$37.26_8 = 011\ 111.\ 010\ 110_2^{00}$

$= 1F.58_{16}$

note: it is important to know when to use each method!