Binary Conversions

Friday, 4 December 2020 3:01 PM

1. Numbers — Denary (Decimal), Binary, Hexa-Decimal } Max. 2Bytes.
2. Text
3. Images
4. Video
5. Sound.

Number Systems:

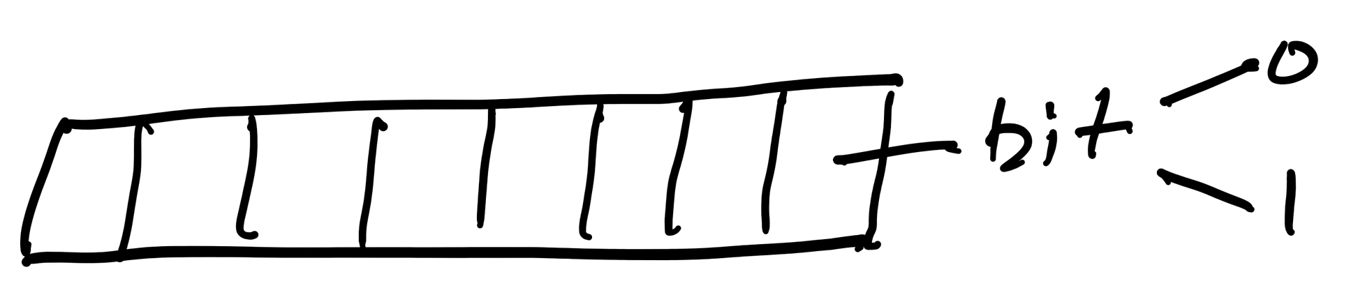
* Denary, Binary, Hex

Denary (Decimal): (10) — 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 Digits.
Unique digits count = 10
Base = 10

Binary: (2) — 0, 1 — Binary Digits — bit 0, 1
Unique Digits Count = 2
Base = 2

Hexa-Decimal: (6 + 10 = 16) — 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, (Decimal) A, B, C, D, E, F (Hex)
Unique Digits Count = 16
Base = 16

Denary ⇄ Binary ⇄ Hex



BYTE = 8bits

- Least data that a computer saves is a byte.
- Computer always saves in multiples of bytes.

Denary

(MSD) Most Significant Digit — Least Significant Digit (LSD)

1	3	8	5	
10^3	10^2	10^1	10^0	— Base (Position)
1000	100	10	1	— Worth

Read, judge, evaluate, write →

Form ← 1000 100 10 1

Binary

B = Byte
b = bit

MSb … LSb

0	0	0	0	1	1	1	0	
2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	— Base (Position)
128	64	32	16	8	4	2	1	— Worth

Most Important Part → 128

Hex.

MSD … LSD

3	A	9	D	C	
16^4	16^3	16^2	16^1	16^0	— Base (Position)
65536	4096	256	16	1	— Worth

Denary:

$4 \times 1000 + 0 \times 100 + 9 \times 10 + 6 \times 1 = 4000 + 0 + 90 + 6 = \boxed{4096}$

Binary:

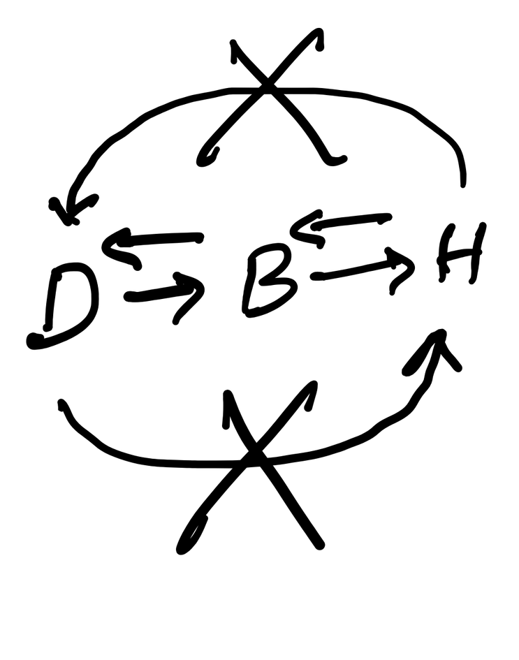
$0 \times 128 + 0 \times 64 + 0 \times 32 + 0 \times 16 + 1 \times 8 + 1 \times 4 + 1 \times 2 + 0 \times 1 = 0 + 0 + 0 + 0 + 8 + 4 + 2 + 0 = \boxed{14}$

Hex:

$A \times 4096 + C \times 256 + 3 \times 16 + F \times 1 = 40960 + 3072 + 48 + 15 = \boxed{44095}$

A = 10
B = 11
C = 12
D = 13
E = 14
F = 15

- This Hex to Den conversion method is avoided and an alternative method will be used.
- This method is used when we like to convert directly from Hex to Den. So, if we go from Hex to Bin and then Bin to Hex, that will be much more easier to handle without Calculator.
- This will save us both time and effort. Results will be more accurate as chances of errors are reduced.



Conversions

Denary	128	64	32	16	8	4	2	1	Hex
40	0	0	1	0	1	0	0	0	
100	0	1	1	0	0	1	0	0	
15	0	0	0	0	1	1	1	1	
200	1	1	0	0	1	0	0	0	
127	0	1	1	1	1	1	1	1	
255	1	1	1	1	1	1	1	1	