

Bin \rightarrow 2
 \rightarrow Dec

Dec \rightarrow Bin

2^n

$$110_2 = ?_{10}$$

$$\begin{array}{ccc} 1 & 1 & 0 \\ \downarrow & \downarrow & \downarrow \\ 2^2 & 2^1 & 2^0 \\ \downarrow & \downarrow & \downarrow \\ 4 & 2 & 1 \\ \text{"} & \text{"} & \text{"} \\ 4 & + 2 & + 0 = 6_{10} \end{array}$$

$6_{10} \rightarrow ?_2$

$$\begin{array}{r} 2 \overline{) 6} \\ \underline{2} \\ 4 \\ \underline{2} \\ 2 \\ \underline{2} \\ 0 \end{array} \begin{array}{l} \rightarrow 1 \\ \rightarrow 1 \\ \rightarrow 1 \\ \rightarrow 0 \\ \rightarrow 1 \end{array}$$

110_2

Octal Number System

mod 8 $\rightarrow 0, 1, 2, 3, 4, 5, 6, 7$

Oct \rightarrow Dec

8^n Ex $127_8 \rightarrow ?_{10}$

$$\begin{array}{ccc} 1 & 2 & 7 \\ \uparrow & \uparrow & \uparrow \\ 8^2 & 8^1 & 8^0 \\ \downarrow & \downarrow & \downarrow \\ 64 & 8 & 1 \end{array} \begin{array}{l} \times \\ \\ \end{array}$$

$$\begin{array}{ccc} \text{"} & \text{"} & \text{"} \\ 64 & + 16 & + 7 \\ \hline 80 & & 87 \end{array}$$

$\therefore 127_8 = 87_{10}$

Ex $87_{10} \rightarrow ?_8$

127

$$\begin{array}{r} 8 \overline{) 87} \\ \underline{8} \\ 0 \\ \underline{8} \\ 7 \\ \underline{8} \\ 0 \end{array} \begin{array}{l} \rightarrow 7 \\ \rightarrow 2 \\ \rightarrow 1 \end{array}$$

$\therefore 87_{10} = 127_8$

Hexadecimal Number System

Hex 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$

A B C D E F

0-9, A-F

Ex $2A_{16} = ?_{10}$

$$\begin{array}{cc} 2 & A \\ \downarrow & \downarrow \\ 16 & 16 \\ \downarrow & \downarrow \\ 16 & 1 \end{array}$$

$$32 + 10 = 42_{10}$$

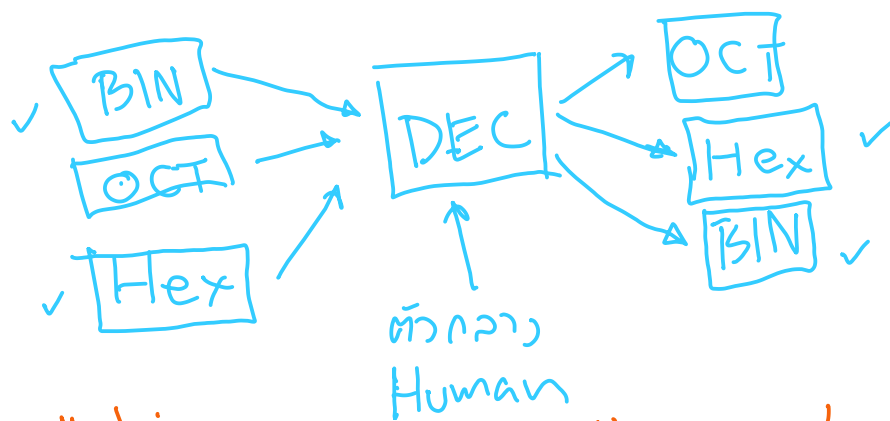
$\therefore 2A_{16} = 42_{10}$

Ex $42_{10} \rightarrow ?_{16}$

$2A$

$$\begin{array}{r} 16 \overline{) 42} \\ \underline{16} \\ 2 \\ \underline{16} \\ 0 \end{array} \begin{array}{l} \rightarrow 2 \\ \rightarrow A \end{array}$$

$\therefore 42_{10} = 2A_{16}$



Machine BIN	OCT	Human DEC	Hex
0000	0	0	0
0001	1	1	1
0010	2	2	2
0011	3	3	3
0100	4	4	4
0101	5	5	5
0110	6	6	6
0111	7	7	7
1000	10	8	8
1001	11	9	9
1010	12	10	A
1011	13	11	B
1100	14	12	C
1101	15	13	D
1110	16	14	E
1111	17	15	F
10000 ₂	20 ₈	16 ₁₀	10 ₁₆

"0" — 0V, GND
 "1" — 5V, +V, V_{CC}

1010101010101010
 1010101010101010
 BIN, DEC, Hex ⇒ Hex, BIN, DEC

Ex1 10110₂ → Hex

BIN → DEC → Hex

2ⁿ → Dec → 16 | Dec
 ⋮
 ⋮

EX2 បំប្លែង 271_8 ទៅជា Hex

Oct \rightarrow DEC \rightarrow Hex

$8^n \rightarrow$ DEC \rightarrow Hex Dec

បំប្លែង 271_8 ទៅជា Hex-បំប្លែង