Binary

0 and 1

ตัวคูณประจำหลักจะเป็น 2^n

ex. 1 1 0 1 Binary → Decimal

2^3 2^2 2^1 2^0

ไม่มี

$8+4+1$

$= 13$ #

37 → $32+4+1$

$2^5+2^2+2^0$

1 0 0 1 0 1

- Substraction method

ex. 142 - 14 = 6

~~128~~ 64 32 16 ~~8~~ 4 2 1

1 0 0 0 1 1 1 0

339 — 256 = 83 — 64 = 19

256 128 64 32 16 8 4 2 1

1 0 1 0 1 0 0 1 1

- Successive division method

(least significant bit)

142 ÷ 2 = 71 R0 LSB

71 / 2 = 35 R1

35 / 2 = 17 R1

17 / 2 = 8 R1

8 / 2 = 4 R0

4 / 2 = 2 R0

2 / 2 = 1 R0

1 / 2 = 0 R1 MSB (most significant bit)

stop here

Ans. 10001110

169 R1

84 R1

42 R0

21 R0

10 R1

5 R0

2 R1

1 R0

0 R1

10101001 1

Hexadecimal number

0-9, A, B, C, D, E, F

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

Hexa → Decimal

ex. 05A1

Digit	3	2	1	0
Multiplier	16^3	16^2	16^1	16^0
Hex	0	5	A	1

$0 \times 16^3 \quad 5 \times 16^2 \quad 10 \times 16^1 \quad 1 \times 16^0$

$1,280 + 160 + 1$

$= 1441$ #

23E

$2 \times 16^2 + 3 \times 16 + 14$

$512 + 48 + 14$

$560 + 14 = 574$

$F7D_{16}$

$15 \times 16^2 + 7 \times 16 + 13$

$3840 + 112 + 13 = 3,965$

$ABO9_{16}$

$10 \times 16^3 + 11 \times 16^2 + 9$

$40,960 + 2816 + 9$

$= 43,785$ #

Binary → Hexadecimal

Binary	Hex
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
1010	A
1011	B

~~0~~0101110100

— " —

ให้ group Binary ทีละ 4 bits

Hex to Binary

A35F = 1010 0011 0101 1111

A 3 5 F (16 bits)

1010 0011 0101 1111