

Decimal Base 10	Binary Base 2	Octal Base 8	Hexadecimal Base 16
0	0	0	0
1	1	1	1
2		2	2
3		3	3
4		4	4
5		5	5
6.....		6	6
		7	7
		10	8
		11	9
		12	A
		13	B
		14	C
		15	D
		16	E
		17	F

## Binary to Decimal

example

1010

$$\begin{aligned} & (2^0 * 0) + (2^1 * 1) + (2^2 * 0) + (2^3 * 1) \\ &= (1 * 0) + (2 * 1) + (4 * 0) + (8 * 1) \\ &= 0 + 2 + 0 + 8 \\ &= 10 \end{aligned}$$

octal to decimal and hexa to decimal would be similar.

1010<sub>2</sub>

P → Place

↓ ↓ ↓ ↓

3p 2p 1p 0p

$$= 2^0 \times 0 + 2^1 \times 1 + 2^2 \times 0 + 2^3 \times 1$$

$$= 0 + 2 + 0 + 8$$

$$= 10 //$$

## Decimal to binary, hexa and octa

decimal number 10 to binary

Quotient ←

2	10	0
2	5	1
2	2	0
2	1	1
	0	

Remainder ↑

1010<sub>2</sub>

---

decimal 10  
to octal

8	10	2
8	1	1
	0	

Remainder ↑

12<sub>8</sub>

### Binary to hexa

10111001

hexa----16---2<sup>4</sup>

10111001



11 9



B9

(16)

### hexa to binary

B9  
16

B 9



11 9



1011 1001

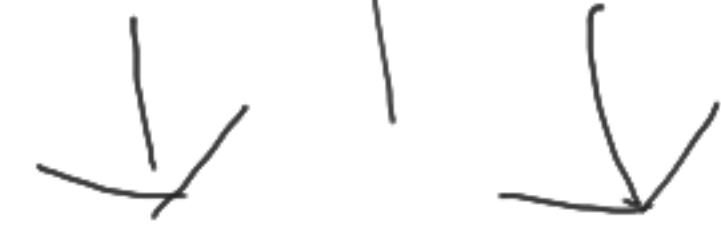
(2)

### octa to binary

101011 (2)

Octa - 2 (3)

101 011



5

3

(53)<sub>8</sub>

hexa to octa

hexa-----decimal-----octa

hexa-----binary-----octa

octa to hexa

octa-----decimal-----hexa

octa-----binary-----hexa

Decimal Number	4-bit Binary Number	Hexadecimal Number	Octal
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	8	10
9	1001	9	11
10	1010	A	12
11	1011	B	13
12	1100	C	14
13	1101	D	15
14	1110	E	16
15	1111	F	17







