Bitmasking

1) AND :

⇒

a	b	a & b
0	0	0
0	1	0
1	0	0
1	1	1

2) OR :

a	b	a || b
0	0	0
0	1	1
1	0	1
1	1	1

3) XOR :

a	b	a ^ b
0	0	0
0	1	1
1	0	1
1	1	0

4) NOT :

→ $a = 11010$

$\bar{a} = 00101$

5) Conversions :

(i) Decimal to base b: keep dividing by base & write remainders in reverse manner

Ex: $(17)_{10}$

2	17	
2	8	1
2	4	0
2	2	0
	1	0

→ $(10001)_2$

(ii) Base b to decimal: multiply & add power of base with digits.

Ex: $(10001)_2$

- $(1 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$
- $16 + 1 = (17)_{10}$

6) Left shift (<<) :

→ Shifts one bit to left side.

Ex: $(10)_{10} \rightarrow (1010)_2$

$1010 << 1 = (10100)_2 \rightarrow (20)_{10}$

→ Any no. a :-

$$a << 1 = 2a$$

→ Any no. a & b :-

$$a << b = a * 2^b$$

7) Right shift (>>) :

→ Shifts one bit to right

Ex:

$00110 >> 1 = (0011)_2 \rightarrow (3)_{10}$

→ Any no. a :-

$$a >> 1 = \frac{a}{2}$$

→ Any no. a & b :-

$$a >> b = \frac{a}{2^b}$$