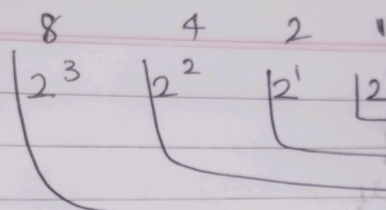


## Bitwise operator



1-bit → 0, 1

2-bit → 0, 1, 2, 3

3-bit → 0, 1, 3, ..., 7

4-bit → 0, 1, ..., 15

2<sup>0</sup> → (0, 1)

Where a 1 there condition the power value

① 2  
0

① 2  
0  
1

$$2^0, 2^1 = 2, 1$$

$$0, 0 = 0$$

$$0, 1 = 1$$

$$1, 0 = 2$$

$$1, 1 = 3$$

$$2^0, 2^1, 2^2 = 1, 2, 4$$

$$000 = 0$$

$$001 = 1$$

$$010 = 2$$

$$011 = 3$$

$$100 = 4$$

$$101 = 5$$

$$110 = 6$$

$$111 = 7$$

$$2^3 \quad 2^2 \quad 2^1 \quad 2^0$$

$$8 \quad 4 \quad 2 \quad 1$$

$$13 \quad 1 \quad 1 \quad 0 \quad 1$$

$$9 \quad 1 \quad 0 \quad 0 \quad 1$$

$$1 \quad 1 \quad 0 \quad 1$$

$$1 \quad 1 \quad 0 \quad 1 \quad 0 =$$



Nested

\* outer if

\* inner if

$(p, s, i) = (s, i, 0)$

$A = 000$

$F = 100$

$G = 010$

$S = 119$

$R = 009$

$P = 101$

$Q = 011$

$W = 111$