Multiplication

$$2^n \cdot 2^m = 2^{n+m}$$

$$\text{e.g. } 2^{12} \cdot 2^{20} = 2^{12+20} = 2^{32} = 4G$$

Division

$$\frac{2^n}{2^m} = 2^{n-m}$$

$$\text{e.g. } \frac{2^{32}}{2^{12}} = 2^{32-12} = 2^{20} = 1M$$

Useful Tables

$2^0 = 1$
$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$
$2^7 = 128$
$2^8 = 256$
$2^9 = 512$
$2^{10} = 1024$

$2^{10} = 1K$ (Kilo)
$2^{20} = 1M$ (Mega)
$2^{30} = 1G$ (Giga)
$2^{40} = 1T$ (Tera)
$2^{50} = 1P$ (Peta)
$2^{60} = 1E$ (Exa)
($2^{70} = 1Z$ (Zetta))
($2^{80} = 1Y$ (Yotta))

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

Hex is sometimes prefixed 0x and binary is sometimes prefixed 0b, try to google
`0xB5 in decimal`
or
`0b10110101 in decimal`

We use *b* for bit and *B* for byte (a byte is eight bits). Each address into memory goes to a byte, NOT a bit. A byte is the smallest unit we can reference/address in memory.

ErikH, November 11, 2022