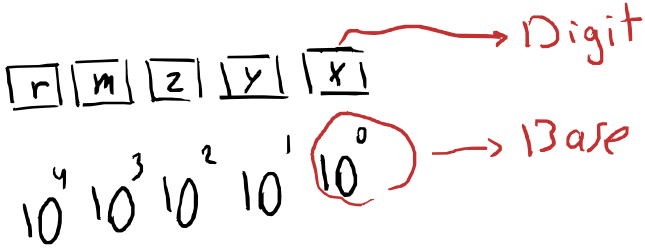
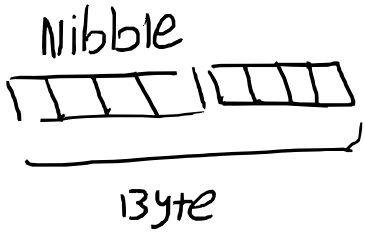


$$r \times 10^4 + m \times 10^3 + z \times 10^2 + y \times 10^1 + x \times 10^0$$

★ they could be base 2, 8, 10, 16, ---.

? I wonder why we don't have base 3, or basically all Prim numbers! ?



~

&

|

^ they should be different

★ All Applied **Bitwise**

★ x & 1 → check for even/odd :

? what is the differences betwee

&/| &&/|| ?

Shift Operation

- Shif
  - left
    - logical <<<
    - Arithmitic <<
  - right
    - logical >>>
    - Arithmitic >> ★ copy MSB and apply that :

Bitmask : any pattern of bit used with bitwise operation to change a given argment.

binary to unsigned

$$B2U_w(\vec{x}) = \sum_{i=0}^{w-1} x_i 2^i$$

binary to signed → Two's complement

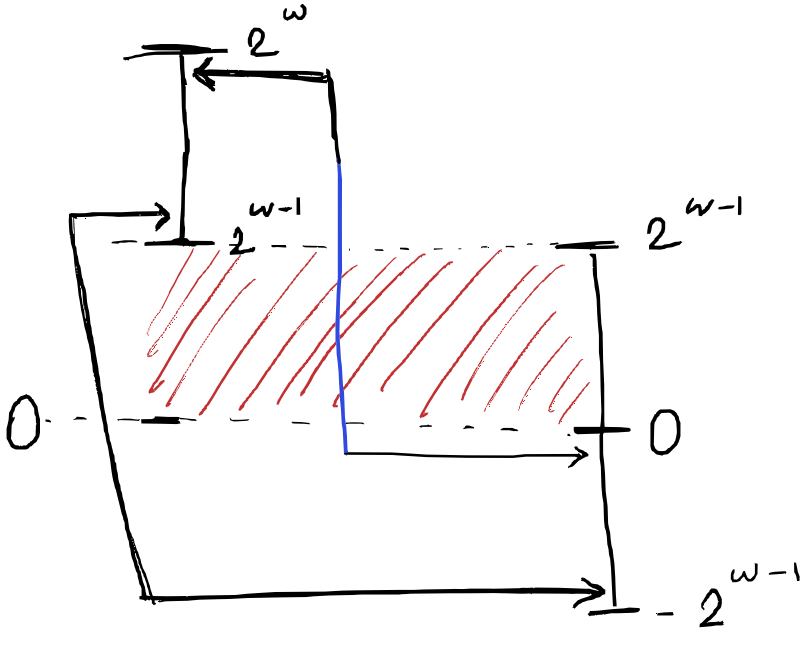
$$B2T_w(\vec{x}) = -x_{w-1} 2^{w-1} + \sum_{i=0}^{w-2} x_i 2^i$$

$$UMAX_w = 2TMAX_w + 1$$

since T is asymmetric "

e.g. $-128 \Leftrightarrow 127$

$$U \rightleftharpoons T$$



Truncating

★ we truncated w bit number to k bit

now how to know its decimal value?

$$B2U_k([x_k, x_{k-1}, \cdots, x_0]) =$$

$$B2U_w([x_{w-1}, x_{w-2}, \cdots, x_0]) \bmod 2^k$$

$$B2T_k([x_k, x_{k-1}, \cdots, x_0]) =$$

$$U2T_k(B2T_w([x_{w-1}, x_{w-2}, \cdots, x_0]) \bmod 2^k)$$

Q. B (question box)

why $[x_k, x_{k-1}, \cdots, x_0]$ but

$[x_{w-1}, x_{w-2}, \cdots, x_0]$?

:" I'D understand.....

the formulas are vague to me.