

# INTEGERS (WHOLE Numbers)

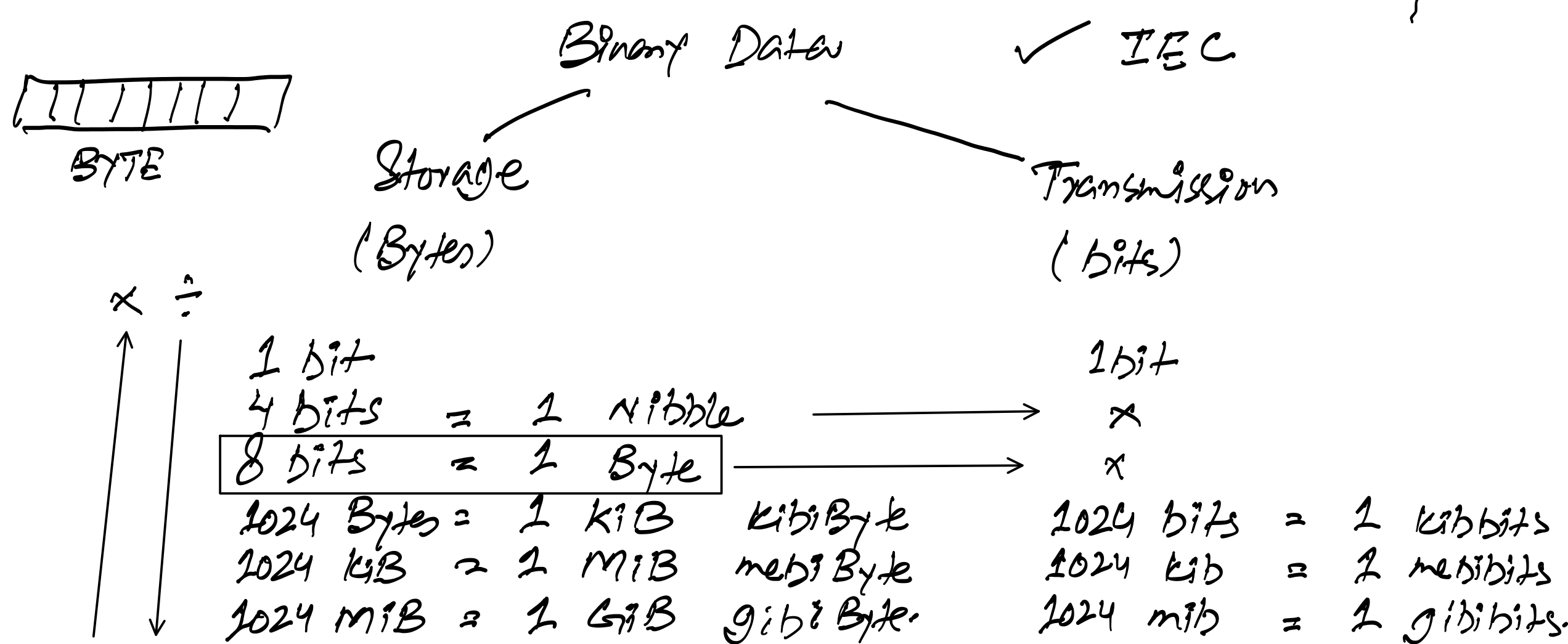
Unsigned  
5, 10, 150

Signed  
+3, -90, +75

- Denary
- Binary
- Hexa-Decimal
- BCD (Binary Coded Decimal)
- 1's Complement
- 2's Complement
- Binary Additions.

Binary Magnitudes  
Memory Measurement  
Memory Sizing.

X SI System:  
mass :  $\frac{kg}{10}$



✓ 1 Byte = 8 bits  
1 KiB = 8 Kib  
1 MiB = 8 Mib  
1 GiB = 8 Gibibits

File Size = 2 MiB  
Speed = 2 Mibps.  
Time = ?

$$Time = \frac{File\ Size}{Speed} = \frac{2\ MiB}{2\ Mibps} = \frac{2 \times 8}{2} = \frac{8}{1} = 8\ sec.$$

File Size : 2 GiB  
Speed : 50 Mibps  
Time : ?

$$\frac{2\ GiB}{50\ Mibps} = \frac{2 \times 1024}{50} = \frac{2048}{50} = \frac{2048 \times 8}{50} = \frac{16384}{50} = 327.68\ sec.$$

File Size : 2 GiB  
Speed : 512 Kibps.  
Time : ? 16384 sec.

$$\frac{2\ GiB}{512\ Kibps} = \frac{2 \times 1024}{512} = \frac{2048}{512} = \frac{2048 \times 1024}{512} = \frac{2097152}{512} = 4096\ sec.$$

GiB → M  
Kib →

$$\frac{16777216\ Kib}{512\ Kib} = 32768\ sec = 546\ min$$

$$\frac{2\ GiB}{512\ Kib} = \frac{2048\ MB}{0.5\ mb} = \frac{2048 \times 8}{0.5} = \frac{16384}{0.5} = 32768\ sec.$$

## Number Conversions:

Denary / Decimal : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9  
Base 10  
Digits.

3  
85  
105

3  
10<sup>3</sup>  
1000

5  
10<sup>2</sup>  
100

2  
10<sup>1</sup>  
10

8  
10<sup>0</sup>  
1

Position  
Base  
Worth

3 5 2 8

1000 100 10 1

3000 + 500 + 20 + 8 = 3528

input  
output  
Denary.

## Binary Conversion:

0, 1  
Binary Digits  
Bit.  
Base 2

0 1 1 0 0 1 0 0

2<sup>7</sup> 2<sup>6</sup> 2<sup>5</sup> 2<sup>4</sup> 2<sup>3</sup> 2<sup>2</sup> 2<sup>1</sup> 2<sup>0</sup>

128 64 32 16 8 4 2 1

0 1 1 0 0 1 0 0

128 64 32 16 8 4 2 1

0 + 64 + 32 + 0 + 0 + 4 + 0 + 0 = 100

input  
o/p  
Den

$$(01100100)_2 = (100)_{10}$$

Hexa Decimal : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9  
A, B, C, D, E, F  
Base 16

1 D 5 E A

16<sup>4</sup> 16<sup>3</sup> 16<sup>2</sup> 16<sup>1</sup> 16<sup>0</sup>

65536 4096 256 16 1

1 D 5 E A

13 14 10

65536 + 53248 + 1280 + 224 + 10 = 120298

input  
o/p  
Denary.