Welcome!

Sunday, October 11, 2020 10:00 PM

$10^8 \longrightarrow$ 1 sec

1) RAM

2) CPU

$\frac{10^{10}}{10^8} = 10^{10-8} = 10^2 = 100$

↳ 1 second ৭ CPU took complete করতে পারে (roughly) 10^8 টাস্ক

```
for(int i=1 ; i<= 10^10 ; i++)
{
    //some task
}
```

→ T = 100 s

---

1 Byte = 8 bits

bit = binary digit → 0 / 1

1 Byte

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \rightarrow 2^8$

$26 = 2^4 + 2^3 + 2^1$

$16 \quad 8 \quad 2$

$= 11010$

$2^4\ 2^3\ 2^2\ 2^1\ 2^0$

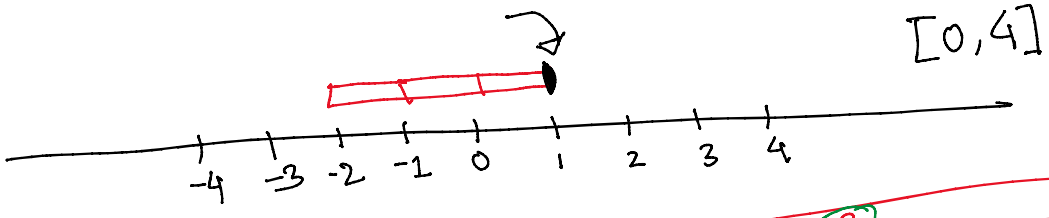
$(11111111)_2 \rightarrow (255)_{10}$

$(100000000)_2 \rightarrow (256)_{10}$

1 Byte = 8 bits $(255 = 2^8 - 1)$

1B → [0,255] Decimal

int num1; → 4 Bytes → 32 bits $2^{32} - 1$



↳ $[0, 2^2 - 1] \rightarrow [0, 3]$

$[-2, 2^1 - 1] \rightarrow [-2^1, 2^1 - 1]$

$[0, 2^{32} - 1]$

$(-2^{31}, 2^{31} - 1]$

$[0, 2^{32}-1]$

$[-2^{31}, 2^{31}-1]$

$[-2, 2-1] \rightarrow [-2^{n}, +2^{n}-1]$

—o—

long long num2; | 8 bytes | → | 64 bits | → $[0, 2^{64}-1]$ → $[-2^{63}, +2^{63}-1]$

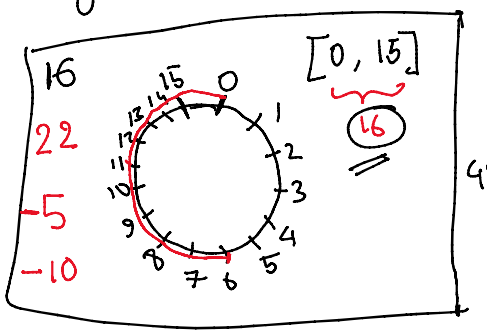
char ch; | 1 Byte | → | 8 bit | → $[0, 2^{8}-1]$ → $[0, 255]$

10 ~ 52 ~ S ~ 8 ~ -8

e c

4294967296

unsigned int → 4 Bytes → 2^{32} → $[0, 2^{32}-1]$ → $[0, 4294967295]$



Range

16 (-10) = 6

Range + neg

16 − 10 = 6

$[0, 2^{32}-1]$

4294967296 (-42) = 4294967254

$2^{32} + neg = 2^{32} - 42 = 4294967254$

—o—

AND

A	B	X = A · B
0	0	0
0	1	0
1	0	0
1	1	1

OR

A	B	X = A + B
0	0	0
0	1	1
1	0	1
1	1	1

XOR

A	B	X = A ⊕ B

XOR

A	B	$X = A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0