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Introduction to Programming

⇒ Before starting programming, we have to understand why we need programming.

⇒ In ~~around~~ the starting, we don't know how to counts the things.

⇒ So, ~~it inv~~ to encounter the problem of counting, we invented number system.

⇒ The first number system is Base 60 number system developed by Egypt.

⇒ After that Decimal number system ~~comes~~ came that developed by India.

⇒ Due to chances of error while dealing with large amount of values, we need a machine that can do it fastly and efficiently with very high accuracy.

⇒ So, to solve this problem, scientist developed Computer (To calculate).

⇒ Firstly developed computers are Mechanical Computers.

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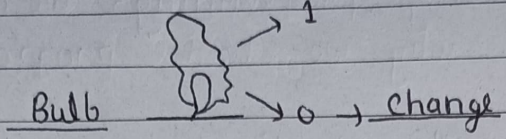
⇒ After 100 years, a new thing developed that is transistor.



⇒ So, here ~~devet~~ a new number system comes in place that was Binary Number System.

Binary No.

$\{0, 1\}$ = Base$_2$

0	0	1	1	10	11
+0	+1	+0	+1	+1	+1
0	1	1	10	11	100

⇒ **Decimal to Binary**

⇒ $(27)_{10} \rightarrow (?)_2$

2	27	Rem
2	13	1
2	6	1
2	3	0
2	1	1
	0	1

↑

$(27)_{10} = (11011)_2$

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⇒ **Binary to Decimal:**

$(1101101)_2 \rightarrow (?)_{10}$

⇒ $2^5 \times 1 + 2^4 \times 1 + 2^3 \times 0 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 1$

⇒ $32 + 16 + 4 + 1$

⇒ 53

Home work

⇒ $(37)_{10} = (100101)_2$

2	37	Rem
2	18	1
2	9	0
2	4	1
2	2	0
	1	0

$(92)_{10}$

2	92	Rem
2	46	0
2	23	0
2	11	1
2	5	1
2	2	1
	1	0

$(128)_{10}$

2	128	Rem
2	64	0
2	32	0
2	16	0
2	8	0
2	4	0
2	2	0
2	1	0
	0	1

⇒ $(1011)_2$

⇒ $1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$

= $8 + 0 + 2 + 1$

= $(11)_{10}$

$(92)_{10} = (1011100)_2$

$(128)_{10} = (10000000)_2$

⇒ $(111001)_2$

⇒ $1 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$

⇒ $32 + 16 + 8 + 0 + 0 + 1$

= $(57)_{10}$

∃ 100 11011

∃ $1\times2^7+0\times2^6+0\times2^5+1\times2^4+1\times2^3+0\times2^2+1\times2^1+1\times2^0$

∃ $128+0+0+16+8+0+2+1$

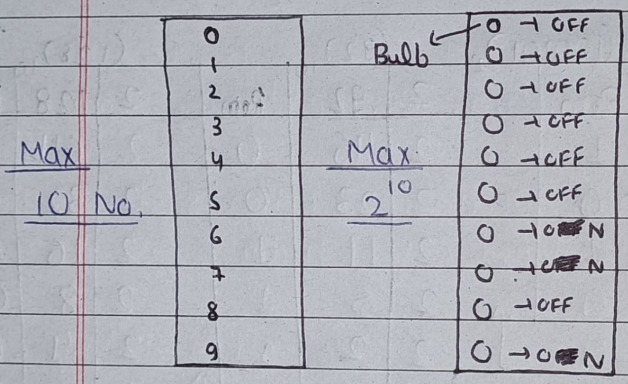
∃ $(255)_{10}$

* **Octa Number System:**

{ 0, 1, 2, 3, 4, 5, 6, 7 }

* **Hexa Decimal Number System:**

{ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F }



Max 10 No.

Max 2^{10}

So,

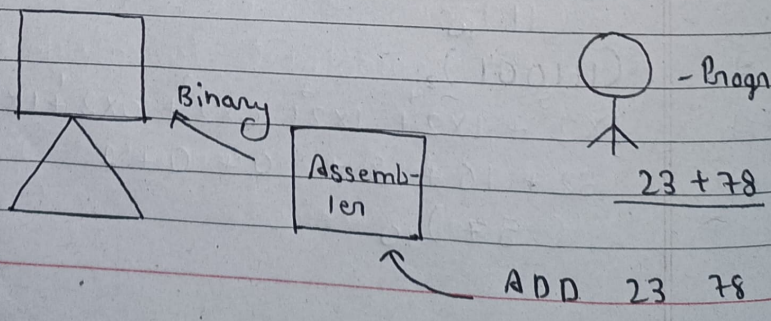
0000001101

↓

13

* **Moore Law:**

∃ In Every 2 year, the capacity of transistor will double.



⇒ Now, High Level Language came.

	M/C	Assembly	HLL
Speed	>>	>>	

Data

Store / Fetch

- Space ↓
- Time ↓

⇒ So, we store anything in proper structure then we can access it in less time and also it takes less space.

⇒ So, here comes the use of DSA.