C Language

Fundamentals of Computers

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Agenda

1. What is a computer?
2. Number System
3. Concept of 0s and 1s

Computer

- Computer is an electronic device which takes some input, process it and gives output

Binary Number System

Decimal NS 0 1 2 3 4 5 6 7 8 9

Octal NS 0 1 2 3 4 5 6 7

Hexadecimal NS 0 1 2 3 4 5 6 7 8 9 A B C D E F

Binary NS 0 1

DNS	ONS	HNS	BNS	DNS	ONS	HNS	BNS
0	0	0	0	19	23	13	10011
1	1	1	1	20	24	14	10100
2	2	2	10	21	25	15	10101
3	3	3	11	22	26	16	10110
4	4	4	100	23	27	17	10111
5	5	5	101	24	30	18	11000
6	6	6	110	25	31	19	11001
7	7	7	111	26	32	1A	11010
8	10	8	1000	27	33	1B	11011
9	11	9	1001	28	34	1C	11100
10	12	A	1010	29	35	1D	11101
11	13	B	1011	30	36	1E	11110
12	14	C	1100	31	37	1F	11111
13	15	D	1101	32	40	20	100000
14	16	E	1110	33	41	21	100001
15	17	F	1111	34	42	22	100010
16	20	10	10000	35	43	23	100011
17	21	11	10001				
18	22	12	10010				

Any system ⟶ Decimal System

Dec
10
25
10 1
2 × 10 + 5

Octal
8
31
8^2 8's unit
3 × 8 + 1 = 25

Hex
16
19
16's unit
1 × 16 + 9 = 25

Bin
2
11001
16 8 4 2 1
1×16 + 1×8 + 0×4 + 0×2 + 1×1 = 25

Place Value

DNS ... 10^3 10^2 10^1 10^0

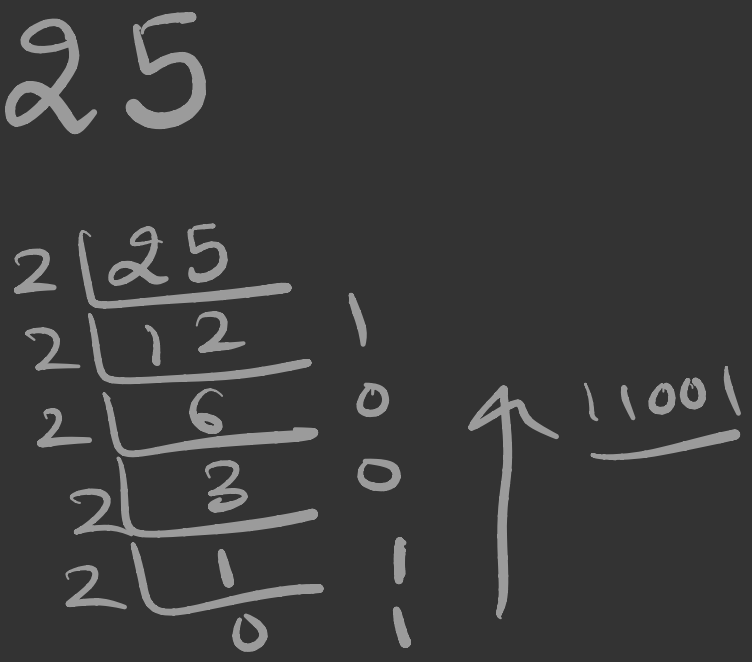
ONS ... 8^3 8^2 8^1 8^0

HNS ... 16^3 16^2 16^1 16^0

BNS ... 2^3 2^2 2^1 2^0

Convert Decimal to Binary

25



			1	1	0	0	1
64	32	16	8	4	2	1
2^6	2^5	2^4	2^3	2^2	2^1	2^0

243

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

Convert Binary to Decimal

11001100 = 204

128 64 8 4

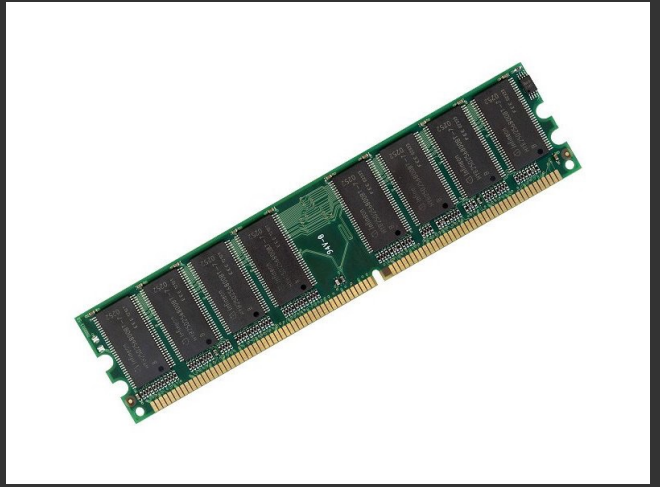
10101011 = 171

128 32 8 2 1

Concept of 0's and 1's

There is no physical significance of 0's and 1's in computer

They are just representation of two states in the hardware



Binary Language

Computer can understand only binary signals, which can be stored, transmitted and processed