



Dr.SNS RAJALAKSHMI COLLEGE OF ARTS AND SCIENCE

(AUTONOMOUS)

COIMBATORE-641049

**Accredited by NAAC(Cycle III) with “A+” Grade
Recognised by UGC, Approved by AICTE, New Delhi and
Affiliated to Bharathiar University, Coimbatore.**



DEPARTMENT OF COMPUTER SCIENCE

Computer System Architecture

I YEAR - I SEM

UNIT 1 – Data Representation

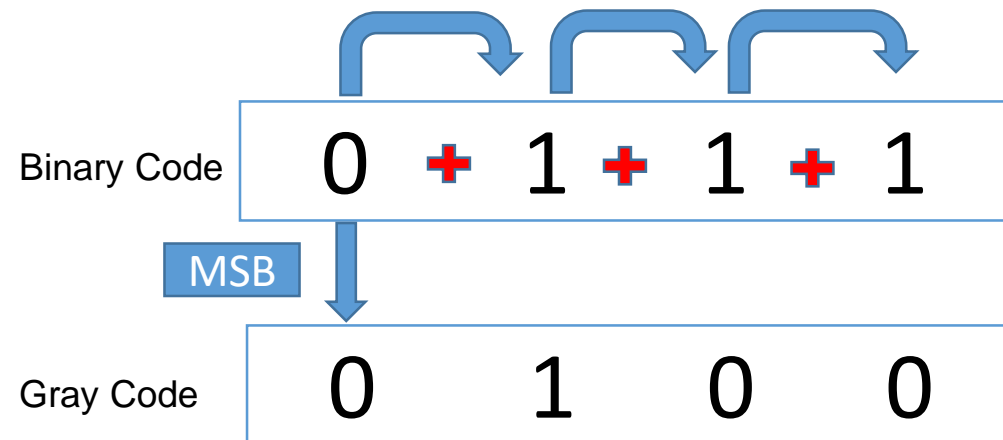
Gray Code

The **Gray Code** is a sequence of binary number systems, which is also known as **Reflected Binary Code**.

XOR Table

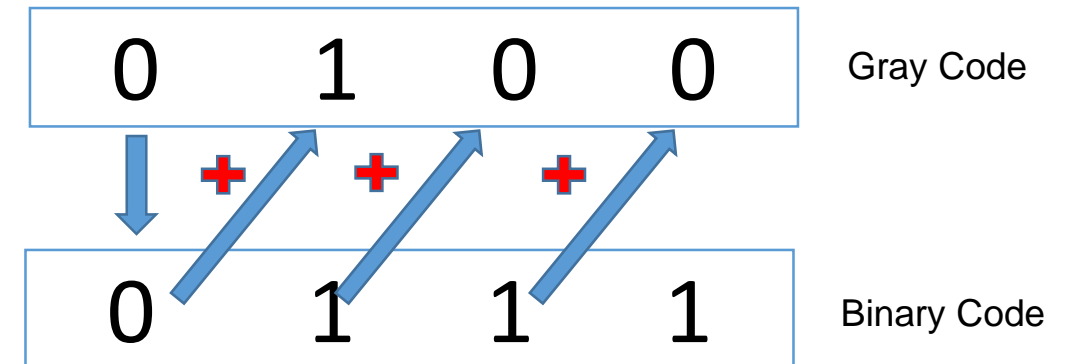
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

Binary Code – Gray Code



The gray code of the binary number **0111** is **0100**

Gray Code – Binary Code



The binary code of the gray number **0100** is **0111**



BCD Code



Binary Coded Decimal, or BCD, is another process for converting decimal numbers into their binary equivalents. .

Decimal	0	1	2	3	4	5	6	7	8	9
BCD	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001

Example 1:

Convert $(123)_{10}$ in BCD

1 -> 0001

2 -> 0010

3 -> 0011

BCD of 123 -> 0001 0010 0011

Example 2:

Convert $(324)_{10}$ in BCD

3 2 4

0011 0010 0100

BCD of 324 -> 0011 0010 0100



Excess-3 code



The **Excess-3 code** (or XS3) is a non-weighted code used to express decimal numbers.

Steps:

- Find the decimal equivalent of the given binary number (if binary number given).
- Add +3 to each digit of decimal number.
- Convert the newly obtained decimal number back to binary number to get required excess-3 equivalent.

Example 1: 87

$$\begin{array}{r} 8 \quad 7 \\ + 3 \quad + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \quad 10 \\ \downarrow \quad \downarrow \\ 1011 \quad 1010 \end{array}$$

Excess code of **87** = **1011 1010**

Example 1: 15.9

$$\begin{array}{r} 1 \quad 5 \quad 9 \\ + 3 \quad + 3 \quad + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \quad 8 \quad 12 \\ \downarrow \quad \downarrow \quad \downarrow \\ 0100 \quad 1000 \quad 1100 \end{array}$$

Excess code of **15.9** is **1001000.1100**



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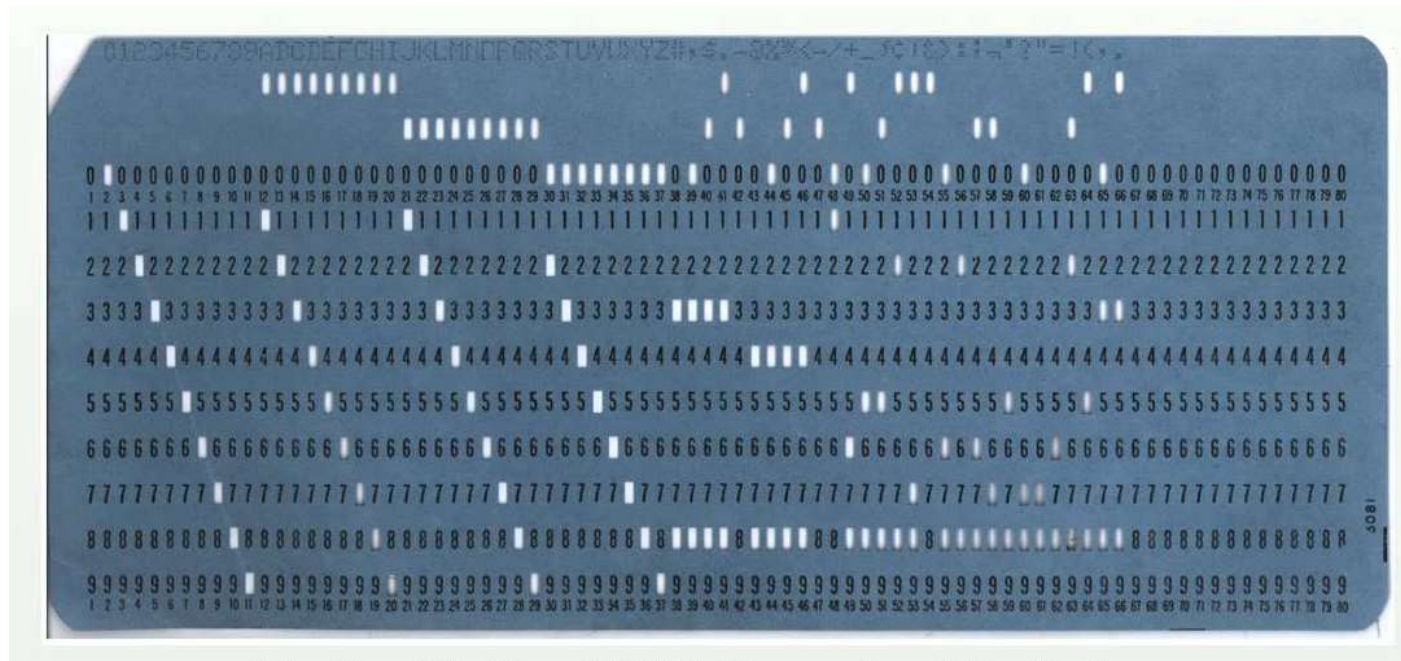
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EBCDIC



Extended binary coded decimal interchange code (**EBCDIC**) is an 8-bit binary code for numeric and alphanumeric characters.





ASCII



ASCII, abbreviation of **American Standard Code For Information Interchange**, a standard data-transmission code that is used by smaller and less-powerful computers to represent both textual data and non input-device commands.

Alphabets	A	B	C	D	E	F	a	b	c	d	e	f
ASCII	65	66	67	68	69	70	97	98	99	100	101	101



Thank You