

## REPRESENTATION OF BINARY NUMBER.

### 1's Complement Representation.

Binary number	1's complement
11011	00100
1110011	0001100

### 2's Complement Representation

$$2's \text{ Complement} = 1's \text{ Complement} + 1$$

Binary number	2's Complement
11011	00101
1110011	0001101

- 1) Represent the following decimal numbers as  
a) Sign and magnitude binary numbers b) 1's complement form c) 2's complement form.  
i) 378 ii) 12.25 iii) -13.75

Solu:

i) 378

The binary form of  $378_{10}$  is  $101111010_2$ .

The Sign and magnitude representation of  $378_{10}$  is

$$\begin{array}{c} 0 \quad 101111010 \\ \downarrow \quad \quad \quad \downarrow \\ \text{Indicating the sign} \quad \quad \quad \text{Indicating the magnitude} \end{array}$$

The 1's complement form of  $0 \underline{10111010}$  is  
 $0 \underline{01000101}$

Note! No need to complement sign bit.

The 2's complement form of  $0 \underline{10111010}$  is  
 $0 \underline{01000110}_2$

ii.) 12.25

The binary form of  $12.25_{10}$  is  $1100.01_2$

The sign and magnitude representation of  $12.25_{10}$  is

$0 \underline{1100.01}$   
↓ Sign      ↳ Indicating the magnitude

The 1's complement form of  $0 \underline{1100.01}$  is  $0 \underline{0011.10}$

The 2's complement form of  $0 \underline{1100.01}$  is  $00011.11_2$

iii.) -13.75

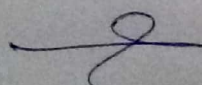
The binary form of  $-13.75_{10}$  is  $-1101.11_2$

The sign and magnitude representation of  $-13.75$  is

$1 \underline{1101.11}$   
↓ Sign      ↳ Indicating the magnitude

The 1's complement form of  $1 \underline{1101.11}$  is  $1 \underline{0010.00}$ .

The 2's complement form of  $1 \underline{1101.11}$  is  $10010.01_2$ .



## WEIGHTED CODES

In weighted codes, each digit position of the number represents a specific weight.

Ex. BCD 8421 code.

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

Decimal	BCD	Binary.
245	0010 0100 0101	1111 0101
125	0001 0010 0101	1111 01

### Example

1) Give the BCD code of  $125.53_{10}$

$$125.53_{10} = (0001 0010 0101 . 0101 0011)_{BCD}$$