

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
 $0 \underline{010000101}$

Note! No need to complement sign bit.

The 2's complement form of $0 \underline{10111010}$ is
 $0 \underline{010000110_2}$

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 .