Section 26 : Miscellaneous #1

15 April 2022   16:49

© Rajat Kumar
https://www.linkedin.com/in/imRajat/
https://github.com/im-Rajat

Section 26 : Miscellaneous #1

Number Systems :

Conversion of Number System :

Decimal to Binary :
- Divide by 2 and take reminder from end to start.

Decimal to Octal :

- Divide by 8 and take reminder from end to start.

$30_{(16)} = 36_{(8)}$

$$8 \underline{|30}$$
$$8 \underline{|3} - 6 \uparrow$$
$$0 - 3$$

Decimal to Hexadecimal :
- Divide by 16 and take reminder from end to start.

$30_{(16)} = 1E_{(16)}$

$$16 \underline{|30}$$
$$16 \underline{|1} - 14 \uparrow$$
$$0 - 1$$

Binary to Decimal :

$11110_{(2)} = 30_{(10)}$

1	1	1	1	0
2^4	2^3	2^2	2^1	2^0

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

$16 + 8 + 4 + 2 + 0 = 30$

Octal to Decimal :

$36_{(8)} = 30_{(10)}$

3	6
8^1	8^0

$3 \times 8 + 6 \times 8^0 =$
$24 + 6 = 30$

Hexadecimal to Decimal :

$1E_{(16)} = 30_{(10)}$

1	E
16^1	16^0

$1 \times 16 + E \times 1$
$16 + 14 = 30$

Octal to Binary :

$125_{(8)} = 1010101_{(2)}$

$$\underline{1} \quad \underline{2} \quad \underline{5}$$
$$001 \quad 010 \quad 101$$

Binary to Octal :

$$10110110_{(2)} = 266_{(8)}$$

$$\underline{\emptyset 1 0} \ \underline{1 1 0} \ \underline{1 1 0}$$
$$2 \quad 6 \quad 6$$

Hexadecimal to Binary :

$$7C4_{(16)} = 11111000100_{(2)}$$

$$7 \quad C \quad 4$$
$$\emptyset 111 \ 1100 \ 0100$$

Binary to Hexadecimal :

$$1001100101 0_{(2)} = 4CA_{(16)}$$

$$\underline{0100} \ \underline{1100} \ \underline{1010}$$
$$4 \quad C \quad A$$

Octal to Hexadecimal :
- So there is no direct method. One method, if we can convert into decimals and convert it to Hexadecimal, otherwise we can take help of binary also. So taking the whole of binary will be easy.
- **Octal -> Binary -> Hexadecimal** Method :

$$276_{(8)} = BE_{(16)}$$

$$\underline{2} \ \underline{7} \ \underline{6}$$
$$10 \ 111 \ 110$$

$$\underline{1011} \ \underline{1110}_{(2)}$$
$$B \quad E$$

Hexadecimal to Octal :
- No direct methos.
- **Hexadecimal -> Binary -> Octal** Method :

$276_{(8)} = BE_{(16)}$

$$\frac{2 \quad 7 \quad 6}{10 \; 111 \quad 110}$$

$$\frac{1011 \; 1110}{B \quad E} {}_{(2)}$$