

$$\begin{pmatrix} 2 & 2 & 2 \\ 0 & 1 & 1 \end{pmatrix}_2 = 2 \times 1 + 2 \times 1 = 3$$

BINARY TO OCTAL CONVERSION

FRACTIONAL PART CONVERSION:

GROUPING OF THREE BITS IS MADE
STARTING FROM BINARY POINT AND MOVING
TOWARDS RIGHT

$$(0.101011011)_2 = (0.533)_8$$

Binary point

Binary 2 2 2
Octal 8 3 2

BINARY TO HEXADECIMAL CONVERSION

INTERGER PART CONVERSION:

DIVIDE BINARY NUMBER INTO GROUP OF FOUR
STARTING FROM LSB AND MOVING TOWARDS
MSB

$$000(1010110101101) = (15AD)_{16}$$

MSB ← (1010110101101) → LSB
 1 5 A D

Binary
2

Hexa
16

2

2⁴

$$2^3 \times 1 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 1 = 1101$$

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

$$8 + 4 + 1 = 13 = D$$

$$2^3 \times 1 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 0 = 1010$$

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

$$8 + 2 = 10 = A$$

BINARY TO HEXADECIMAL CONVERSION

FRACTIONAL PART CONVERSION:

GROUPING OF FOUR BITS IS MADE STARTING FROM BINARY POINT AND MOVING TOWARDS RIGHT

$$(0.101011011)_{28} =$$

↑
Binary

A D 28 ✓

$$(0.AD8)_{16}$$

$$2^3 \ 2^2 \ 2^1 \ 2^0 \\ 1 \ 0 \ 0 \ 0$$

$$2^3 \times 1 = 8$$

(1) OCTAL TO BINARY CONVERSION

REPLACE EACH OCTAL DIGIT BY 3 BIT
EQUIVALENT BINARY

$$2 = 2^{\textcircled{3}}$$

$$(7\ 3\ 5)_8 = (111\ 011\ 101)_2$$

$$(5\ 4\ 7\ 6)_8 = (101\ 100\ 111\ 110)_2$$

(2) OCTAL TO BINARY CONVERSION

REPLACE EACH OCTAL DIGIT BY 3 BIT EQUIVALENT BINARY

$$(753.24)_8 = ()_2$$

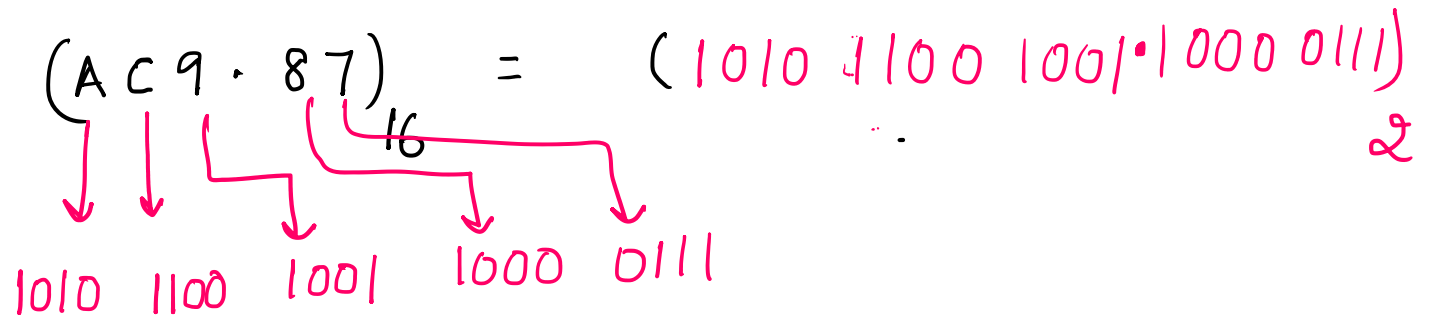
↓ ↓ ↓ ↓ ↓
111 101 011 010 100

(111 101 011 010 100)₂

(1) HEXADECIMAL TO BINARY CONVERSION

REPLACE EACH HEXADECIMAL DIGIT BY 4 BIT
EQUIVALENT BINARY

$$2^2 = 2^4 = 16$$

$$(AC9.87)_{16} = (1010\ 1100\ 1001.1000\ 0111)_2$$


(1) Determine the value base

Monday, August 17, 2020

12:36 PM

$$(16)_{10} = (100)_b$$

$$(16)_{10} = b^2$$

$$b^2 = 16$$

$$b = \sqrt{16} = 4$$

$$\begin{matrix} 2 & 1 & 0 \\ b & b & b \end{matrix} \quad (100)_b = (\quad)_{10}$$

$$b^2 \times 1 + 0 \times b^1 + 0 \times b^0$$

Base = 4 Number

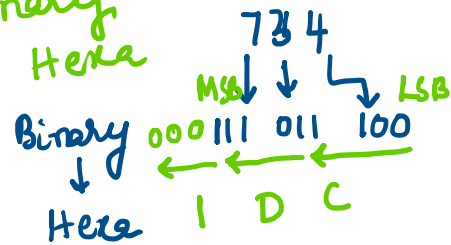
octal to Hexadecimal

Monday, August 17, 2020

4:03 PM

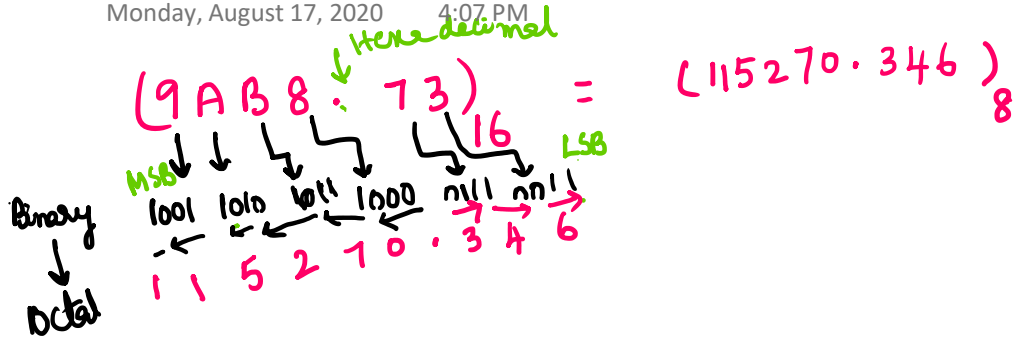
$$(734)_8 = (1DC)_{16} \quad \checkmark$$

- ① octal to binary
- ② Binary to Hexa



Hexa decimal to octal conversion

Monday, August 17, 2020 4:07 PM



Determine base for $(211)_b = (152)_8$

Tuesday, August 18, 2020 10:02 AM

$$(152)_8 = ()_{10} \Rightarrow 1 \times 8^2 + 5 \times 8^1 + 2 \times 8^0 = \underline{\underline{106}}$$

$$(211)_b = 2b^2 + 1b + 1$$

$$(211)_b = (152)_8 \quad ax^2 + bx + c = 0 \Rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
$$2b^2 + b + 1 = 106 \Rightarrow 2b^2 + b - 105 = 0$$

$$b = \underline{\underline{7}} \text{ or } -7.5$$

Base must be positive, so $b = \underline{\underline{7}}$

(3) Determine the value base

$$23 + 44 + 14 + 32 = \overset{b^2}{2}\overset{b^1}{2}\overset{b^0}{3} \rightarrow \text{base ?}$$

$$\begin{array}{lcl} \overset{b^1}{2}\overset{b^0}{3}_b = 2b+3 & \left. \vphantom{\begin{array}{l} (23)_b \\ (44)_b \\ (14)_b \\ (32)_b \end{array}} \right\} & \text{LHS} \\ \overset{b^1}{4}\overset{b^0}{4}_b = 4b+4 & & 2b+3+4b+4+1b+4 \\ \overset{b^1}{1}\overset{b^0}{4}_b = 1b+4 & \left. \vphantom{\begin{array}{l} (23)_b \\ (44)_b \\ (14)_b \\ (32)_b \end{array}} \right\} & \text{RHS} \\ \overset{b^1}{3}\overset{b^0}{2}_b = 3b+2 & & +3b+2 \\ & & 2b^2+2b+3 \end{array}$$

$$2b+3+4b+4+1b+4+3b+2 = 2b^2+2b+3$$

$$b = \underline{\underline{5}}$$

$$\text{Base} = 5$$

(4) Determine the value base

$$\frac{302}{20} = 12.1$$

$$\frac{3b^2 + 2}{2b} = b + 2 + \frac{1}{b}$$

$$\frac{3b^2 + 2}{2b} = \frac{b^2 + 2b + 1}{b}$$

$$3b^2 + 2 = 2b^2 + 4b + 2$$
$$b^2 - 4b = 0$$

$$b^2 - 4b = 0$$

$$b(b - 4) = 0$$

$$b = 0, b = 4$$

base must be
+ve

So Base = 4