



**Math Series**

# C *Programming*

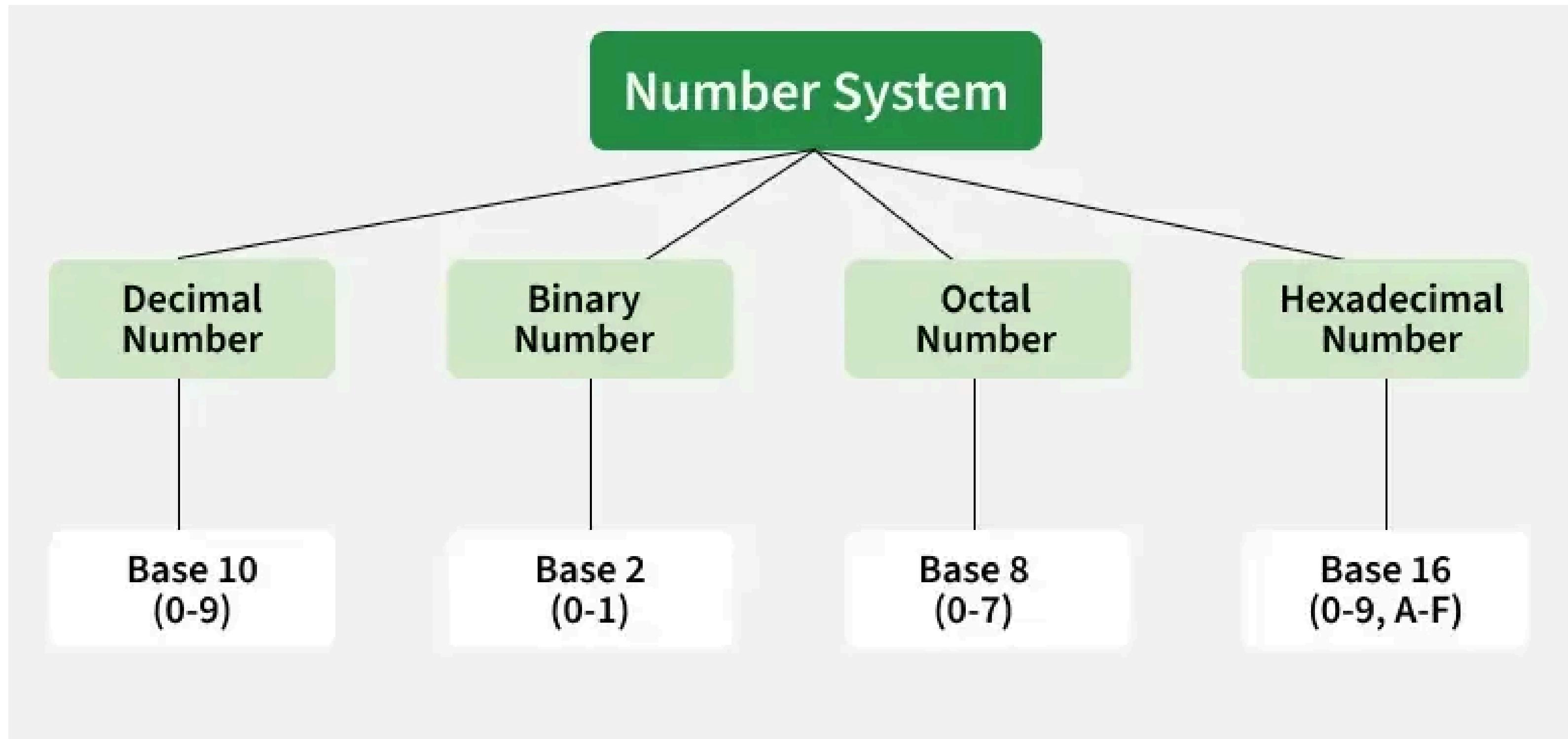
UG Sem-3 Major (Kalyani University)

Day - 10



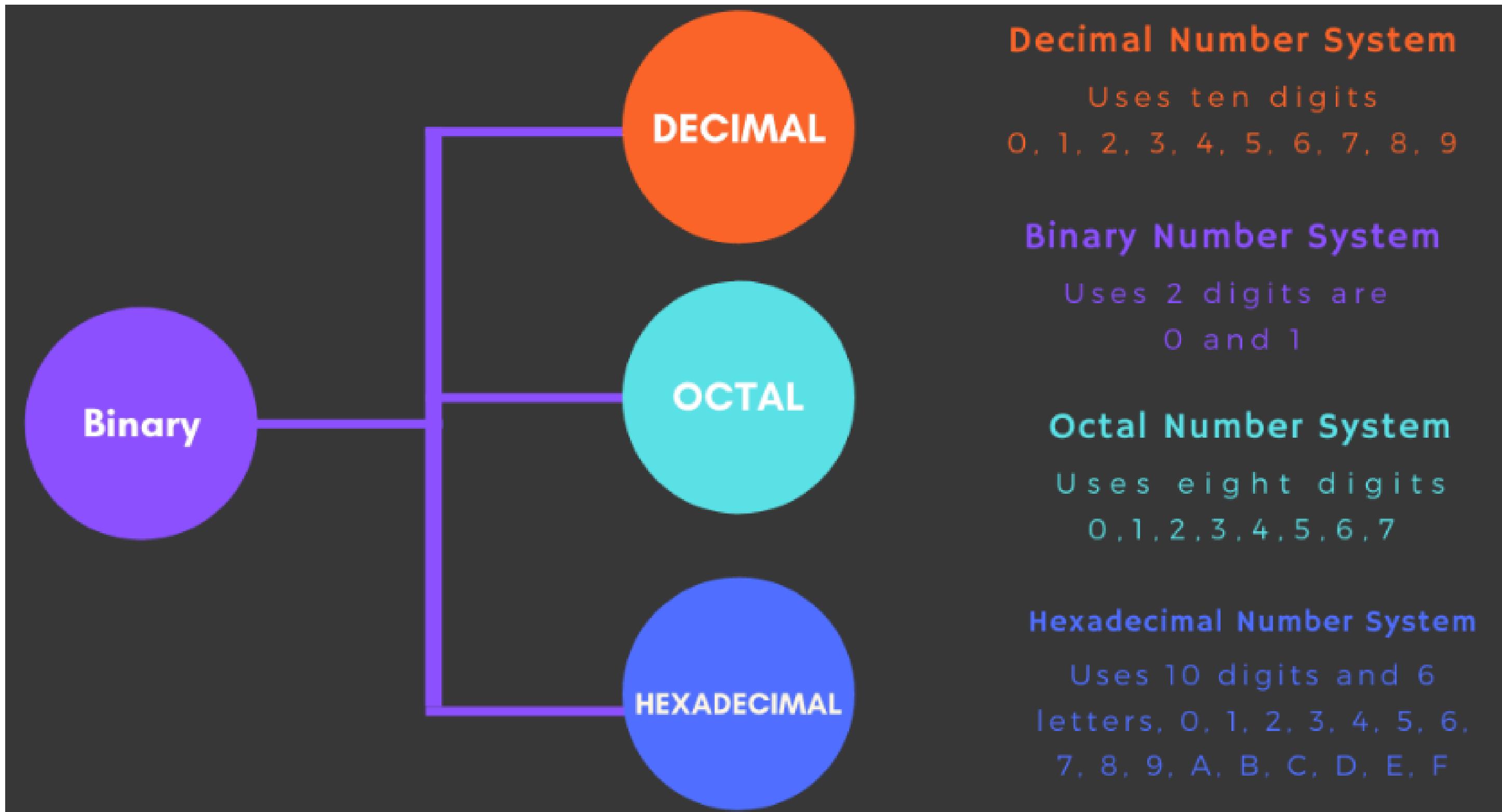
# ***Positional Number System***

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# ***Positional Number System***

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# Decimal to Binary Conversion

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Convert the decimal number 153 into its equivalent binary number.

2	153	(Remainder)
2	76 - 1	(Remainder)
2	38 - 0	(Remainder)
2	19 - 0	(Remainder)
2	9 - 1	(Remainder)
2	4 - 1	(Remainder)
2	2 - 0	(Remainder)
	1 - 0	(Remainder)

Answer: 10011001

# *Decimal to Binary Conversion*

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Convert the decimal number 345 into its equivalent binary number.

division = quotient + remainder;

$$345 \div 2 = 172 + 1;$$

$$172 \div 2 = 86 + 0;$$

$$86 \div 2 = 43 + 0;$$

$$43 \div 2 = 21 + 1;$$

$$21 \div 2 = 10 + 1;$$

$$10 \div 2 = 5 + 0;$$

$$5 \div 2 = 2 + 1;$$

$$2 \div 2 = 1 + 0;$$

$$1 \div 2 = 0 + 1;$$

**Answer: 101011001**

# **Binary to Decimal Conversion**

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**Convert the  $(1011)_2$  into decimal number ?**

A handwritten calculation for binary to decimal conversion. At the top, the binary number 1011 is written with vertical bars above each digit representing powers of 2:  $2^3$ ,  $2^2$ ,  $2^1$ , and  $2^0$ . Below this, a red horizontal line separates the binary digits from the calculation. Underneath the line, the equation  $8 + 0 + 2 + 1 = 11$  is written in red, showing the sum of the products of each binary digit and its corresponding power of 2, resulting in the decimal value 11.

# **Binary to Decimal Conversion**

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Convert the  $(11010011)_2$  into decimal number ?

$$\begin{array}{ccccccccc} & | & | & 0 & | & 0 & 0 & | & 1 \\ \text{128} & 64 & 32 & 16 & 8 & 4 & 2 & & 1 \\ \hline 128+64+0+16+0+0+2+1 = (91)_{10} \end{array}$$

# Decimal to Octal Conversion

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Convert the decimal number  $(2873)_{10}$  into its equivalent octal number

8	2873	Rom
8	359	1↑
8	44	7
8	5	4
8	0	5

# Octal to Decimal Conversion

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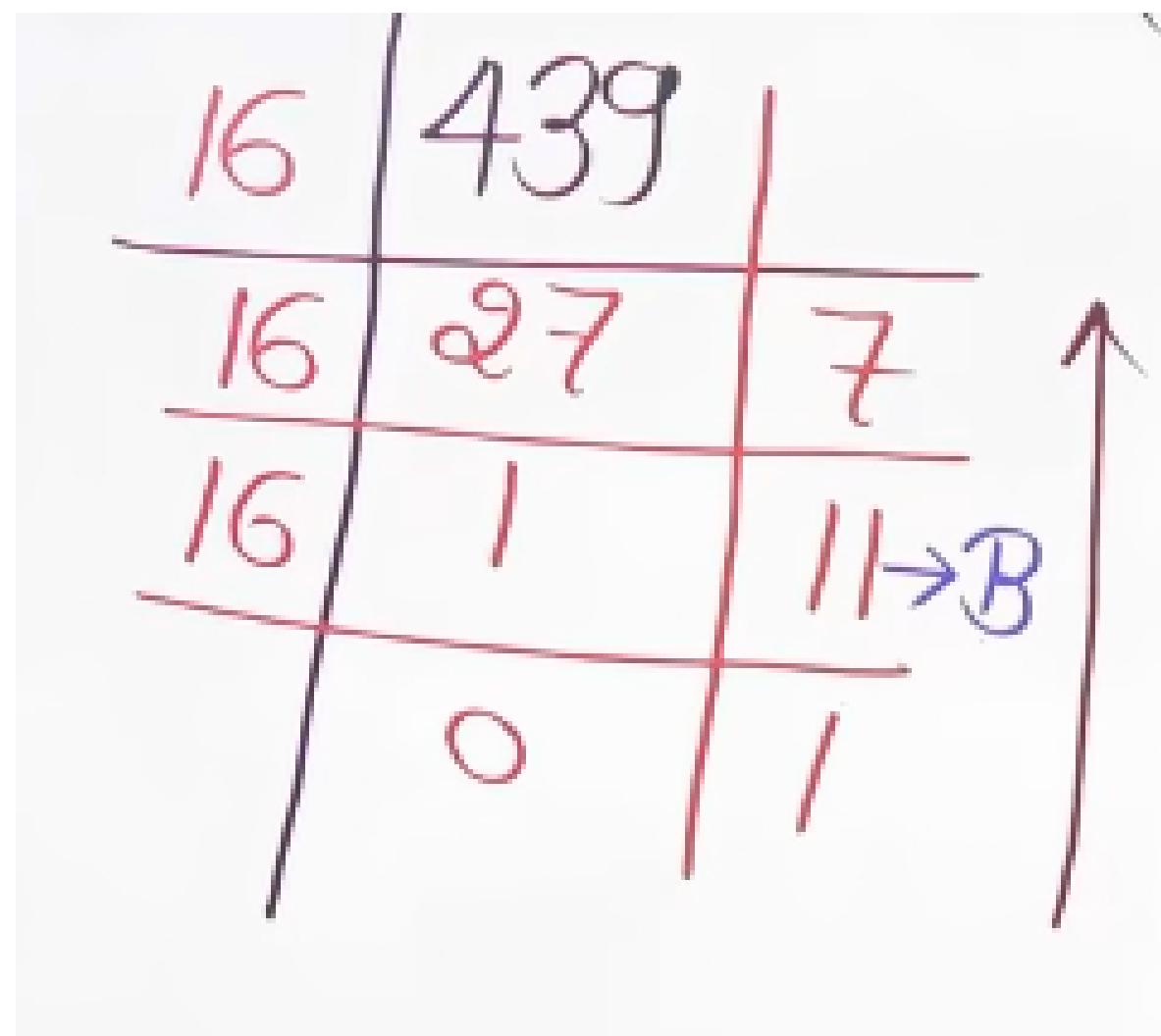
Convert the octal number  $(3451)_8$  into its equivalent decimal number ?

$$\begin{array}{r} 3 \quad 4 \quad 5 \quad 1 \\ 8^3 \quad 8^2 \quad 8^1 \quad 8^0 \\ \hline 1536 + 256 + 40 + 1 \\ = (1833)_{10} \end{array}$$

# Decimal to Hexadecimal Conversion

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Convert the decimal number 439 into hexadecimal



Answer: 1B7

# *Hexadecimal to Decimal Conversion*

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Convert  $(3C7)_{16}$  into Decimal number

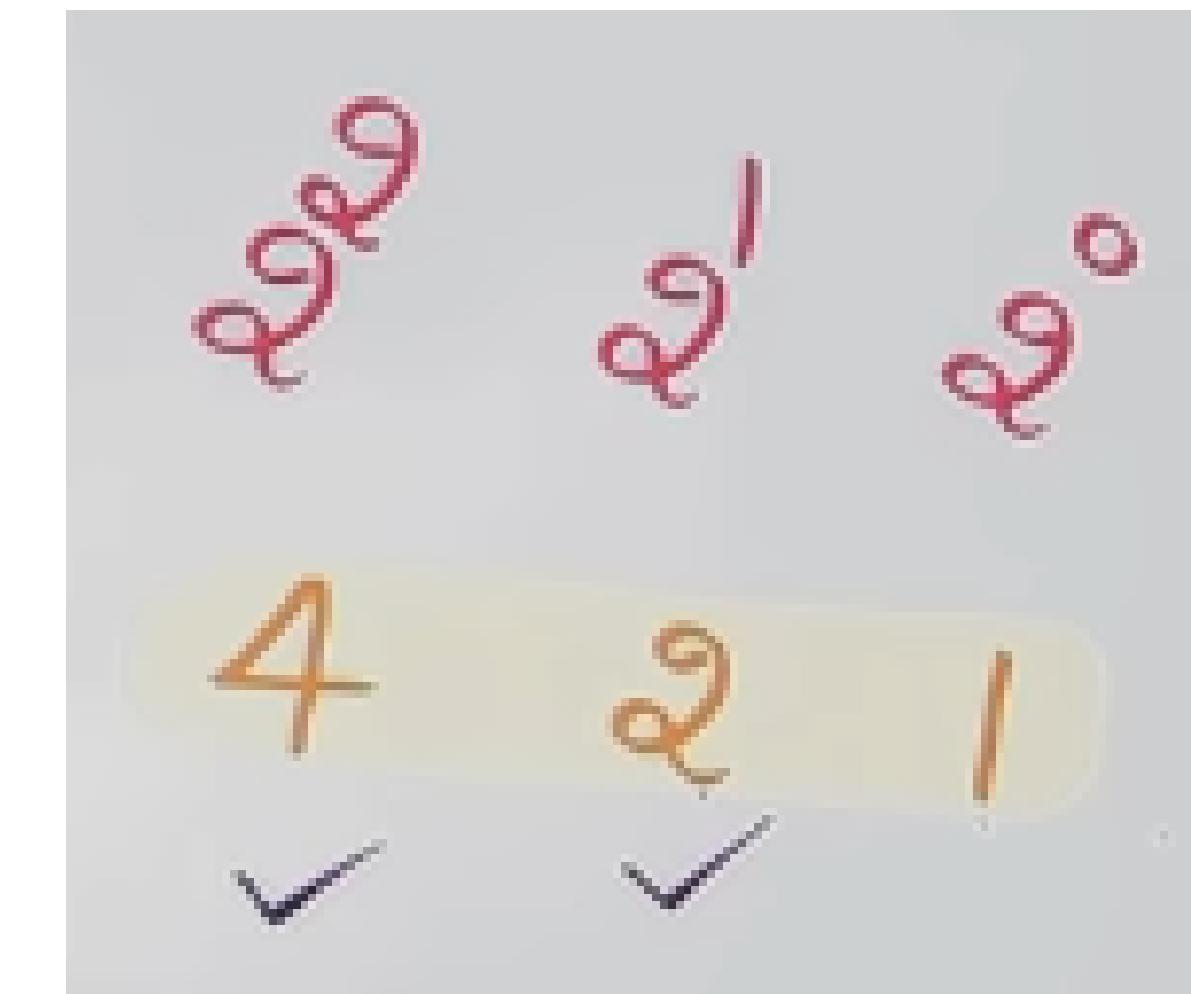
$$\begin{array}{r} 3 \quad C \quad 7 \\ \times \quad \times \quad \times \\ 16^2 \quad 16^1 \quad 16^0 \\ \hline 768 + 192 + 7 \\ = (967)_{10} \end{array}$$

# Octal to Binary Conversion

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Convert the octal number  $(613)_8$  into its equivalent Binary number

$$\begin{aligned} & (6 \quad | \quad 1 \quad 3)_8 \\ = & ((110 \quad 001 \quad 011)_2) \end{aligned}$$

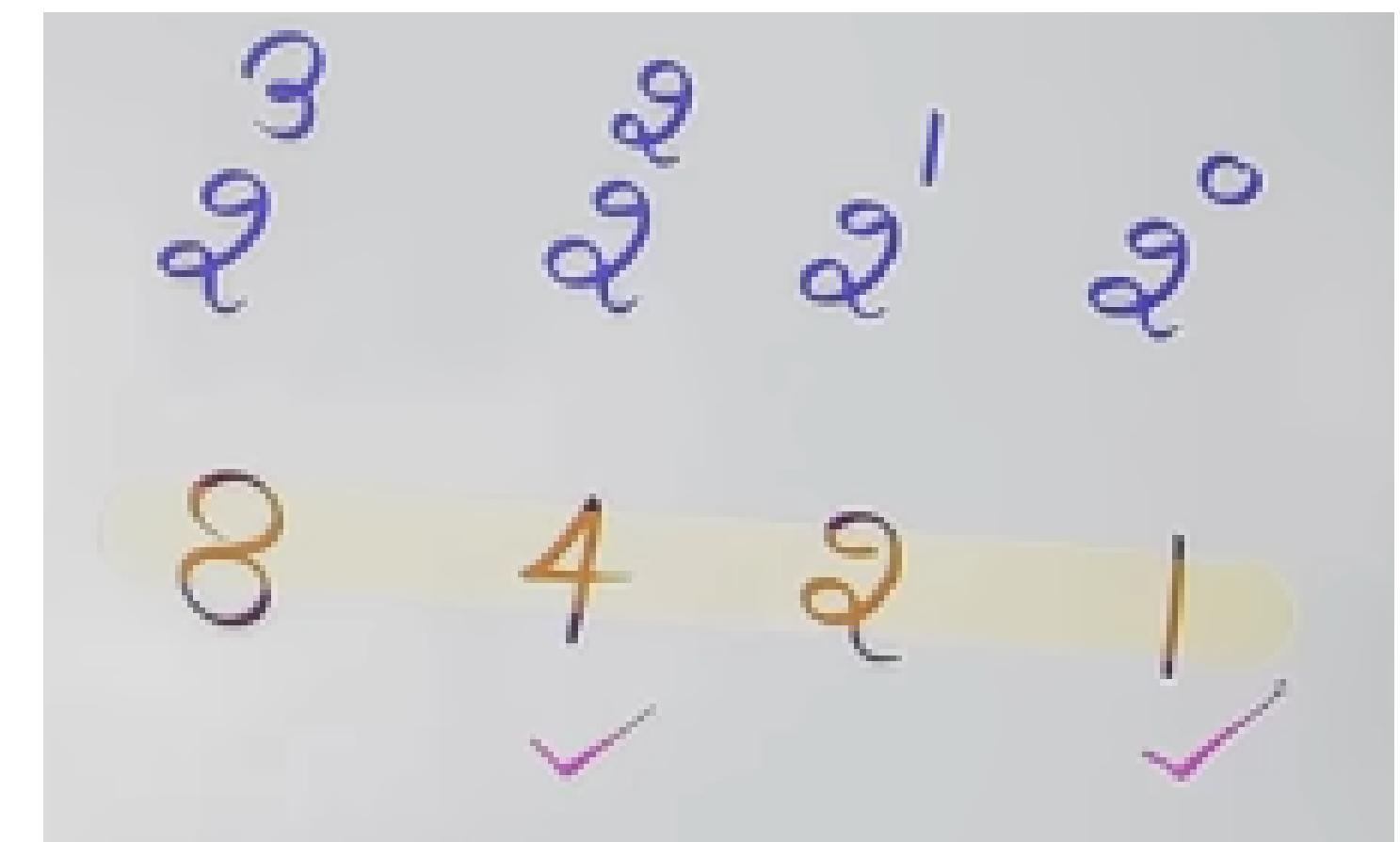


# Hexadecimal to Binary Conversion

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Convert  $(52D)_{16}$  into Binary number

$$(5 \quad 2 \quad 13)_{16}$$
$$= (0/01 \ 00/0 \ 1101)_2$$

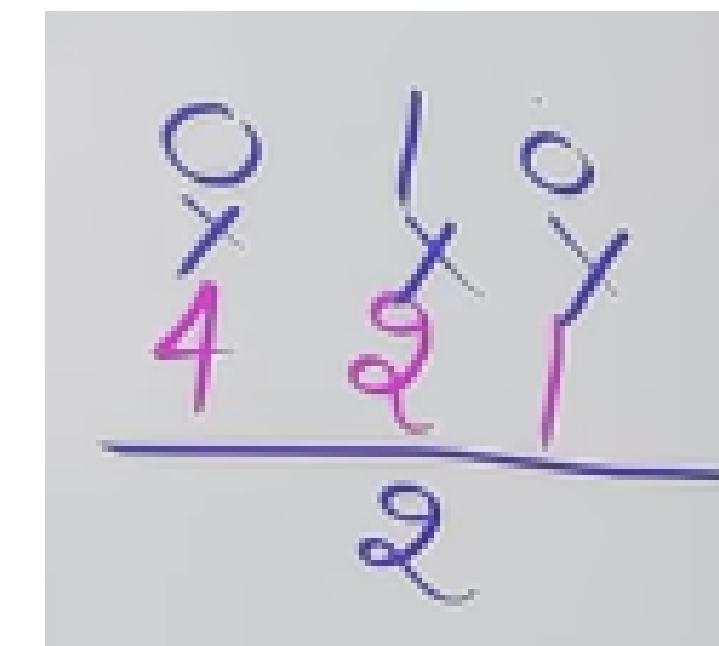
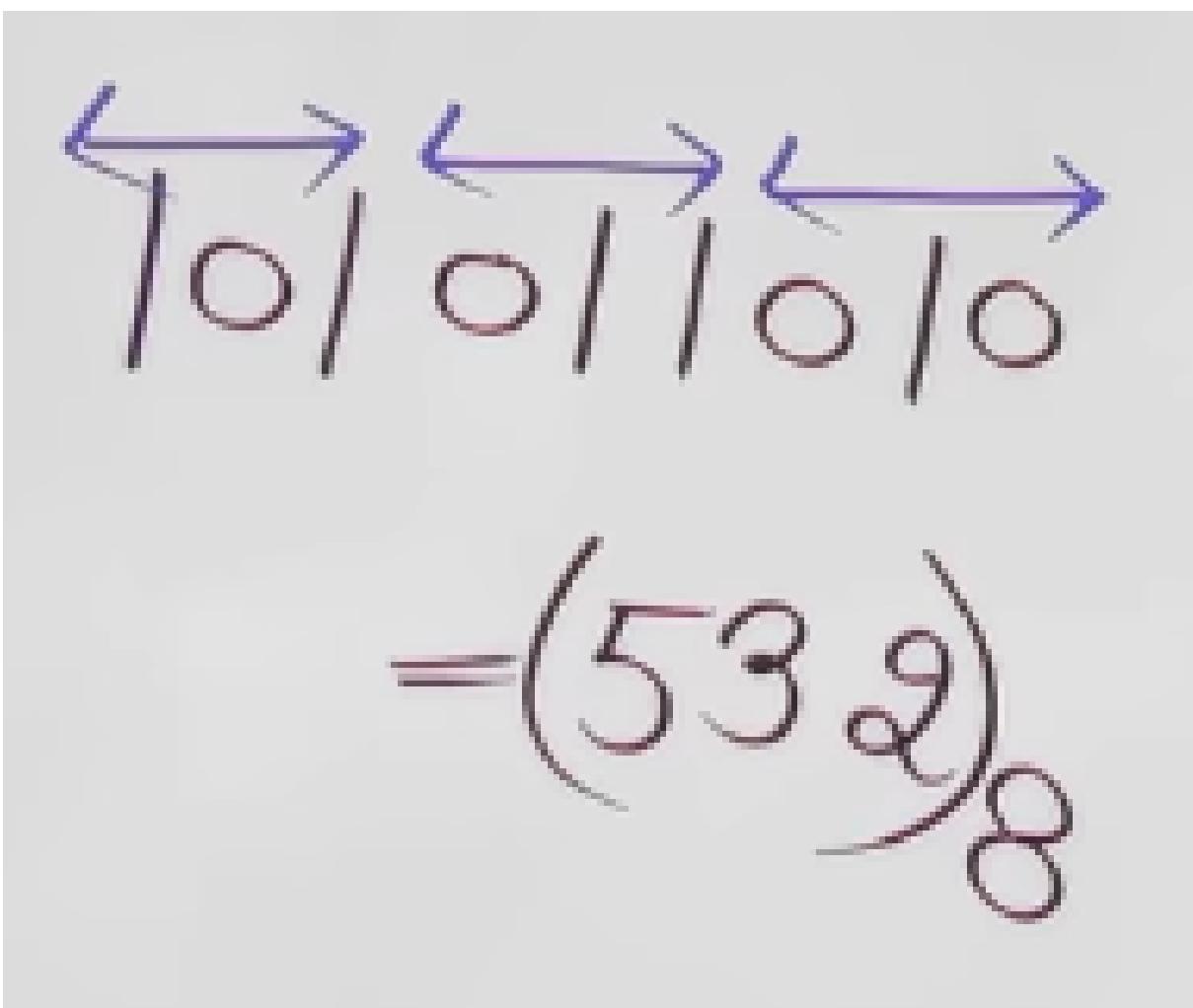


# *Binary to Octal Conversion*

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Convert the  $(101011010)_2$  into octal number

$$\text{Base } 8 = 2^3$$

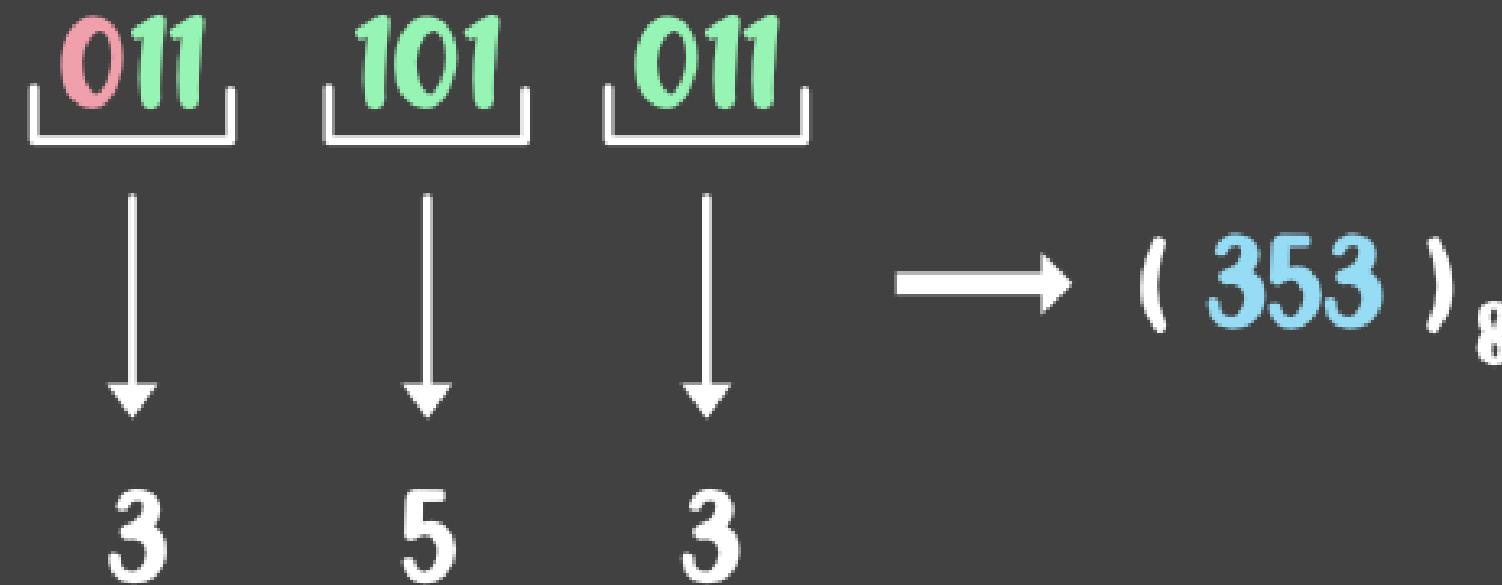


## *Binary to Octal Conversion*

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# Binary to Octal Conversion

$$(11101011)_2 \longrightarrow (?)_8$$



# *Binary to Hexadecimal Conversion*

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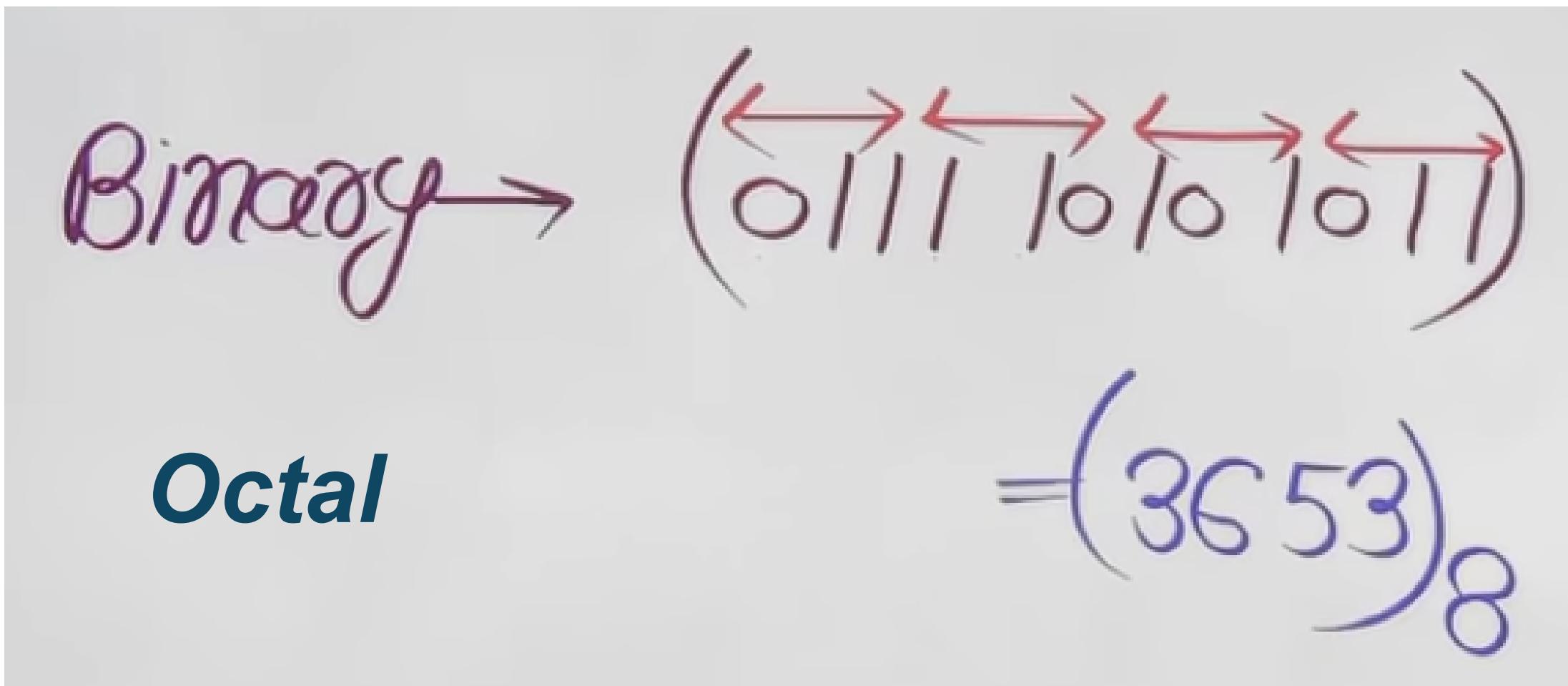
Convert  $(1010110101)_2$  into Hexadecimal.

$$\begin{array}{r} \overbrace{\phantom{00}}^{\text{10}} \mid \overbrace{\phantom{00}}^{\text{10}} \mid \overbrace{\phantom{11}}^{\text{11}} \mid \overbrace{\phantom{01}}^{\text{01}} \\ 00 | 00 | 11 | 01 \\ = (2B5)_{16} \end{array}$$

# Hexadecimal to Octal Conversion

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Convert  $(7AB)_{16}$  into octal number



8 4 2 1  
4 2 1

## *Hexadecimal to Octal Conversion*

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94AF

F=15

8 4 2 1

Binary : (1001010010101111)

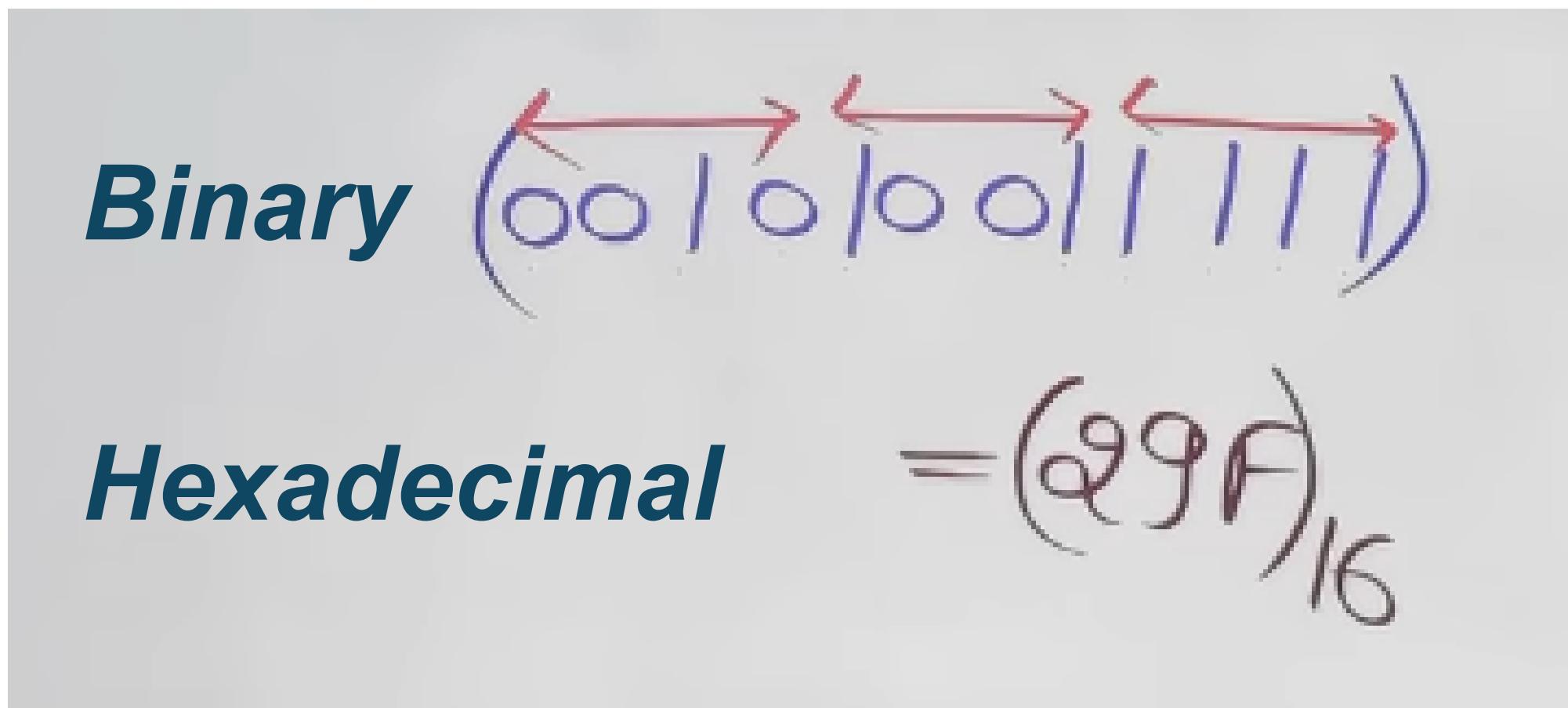
Octal : 112257

4 2 1

# Octal to Hexadecimal Conversion

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Convert  $(1237)_8$  into Hexadecimal number



8 4 2 1  
4 2 1

