

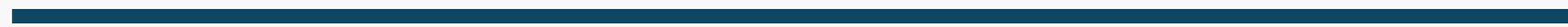


Math Series

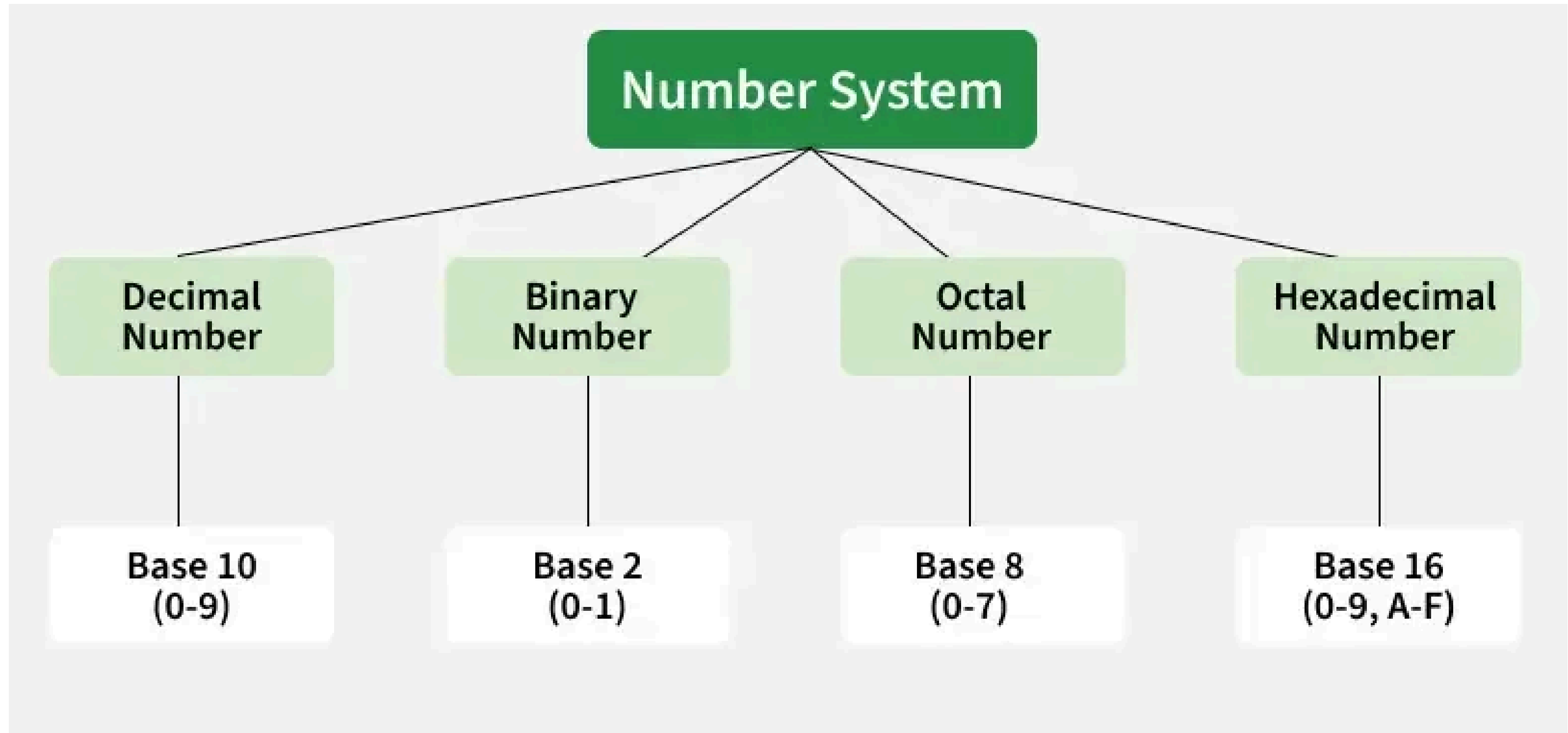
C Programming

UG Sem-3 Major (Kalyani University)

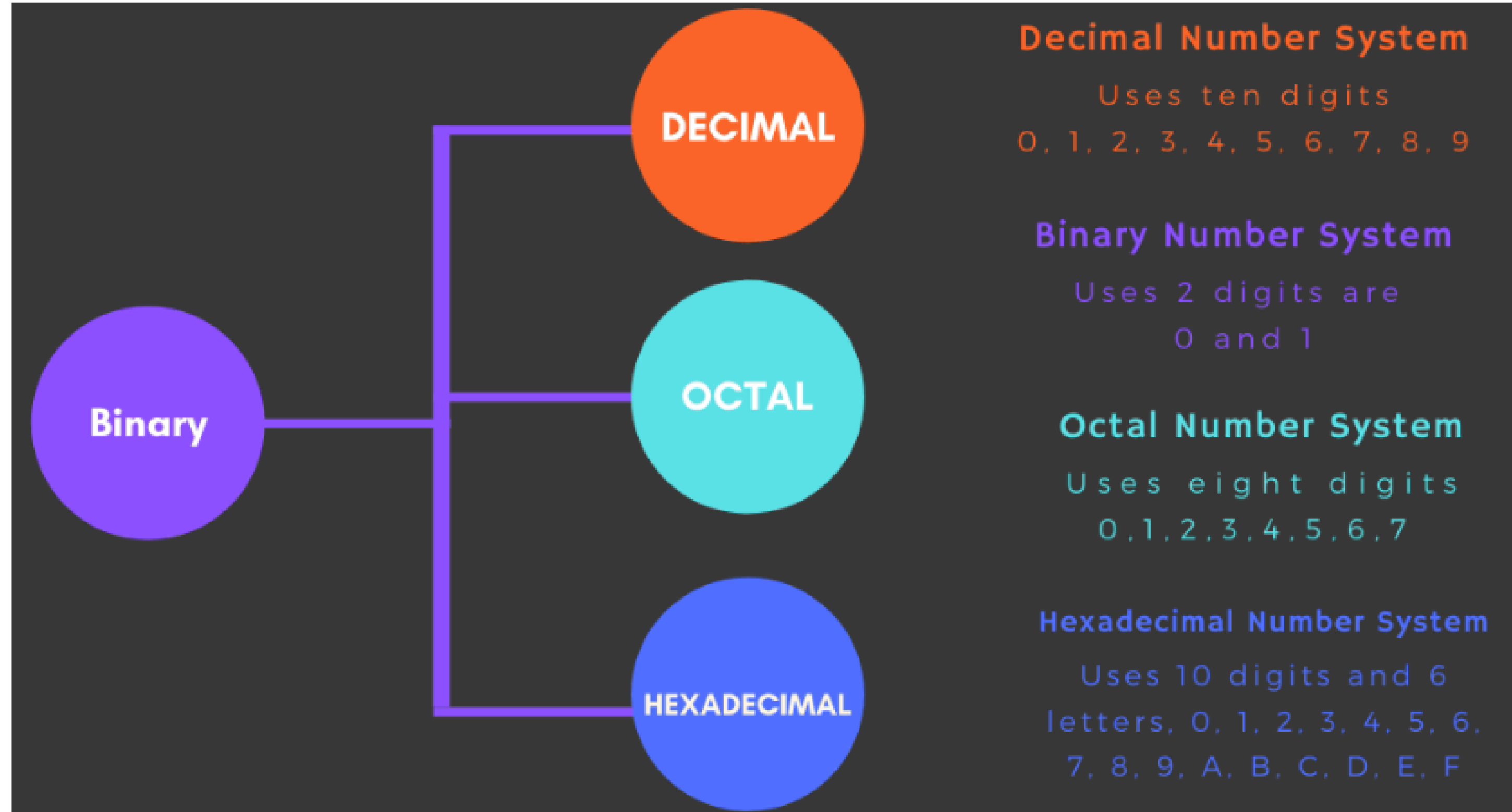
Day - 10



Positional Number System



Positional Number System



Decimal to Binary Conversion

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

Convert the decimal number 345 into its equivalent binary number.

division = quotient + remainder;

Answer: 101011001

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

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

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

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

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

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

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

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

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

Binary to Decimal Conversion

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

The image shows a handwritten calculation for converting the binary number 1011 to decimal. The binary digits 1, 0, 1, 1 are aligned with their respective powers of 2: 2^3 , 2^2 , 2^1 , and 2^0 . A red horizontal line separates the powers from the calculation below. The calculation is $8 + 0 + 2 + 1 = 11$.

$$\begin{array}{cccc} 1 & 0 & 1 & 1 \\ 2^3 & 2^2 & 2^1 & 2^0 \\ \hline 8 + 0 + 2 + 1 = & 11 \end{array}$$

Binary to Decimal Conversion

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

1	1	0	1	0	0	1	1
128	64	32	16	8	4	2	1
<hr/>							
$128 + 64 + 0 + 16 + 0 + 0 + 2 + 1 = (211)_{10}$							

Decimal to Octal Conversion

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

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

Octal to Decimal Conversion

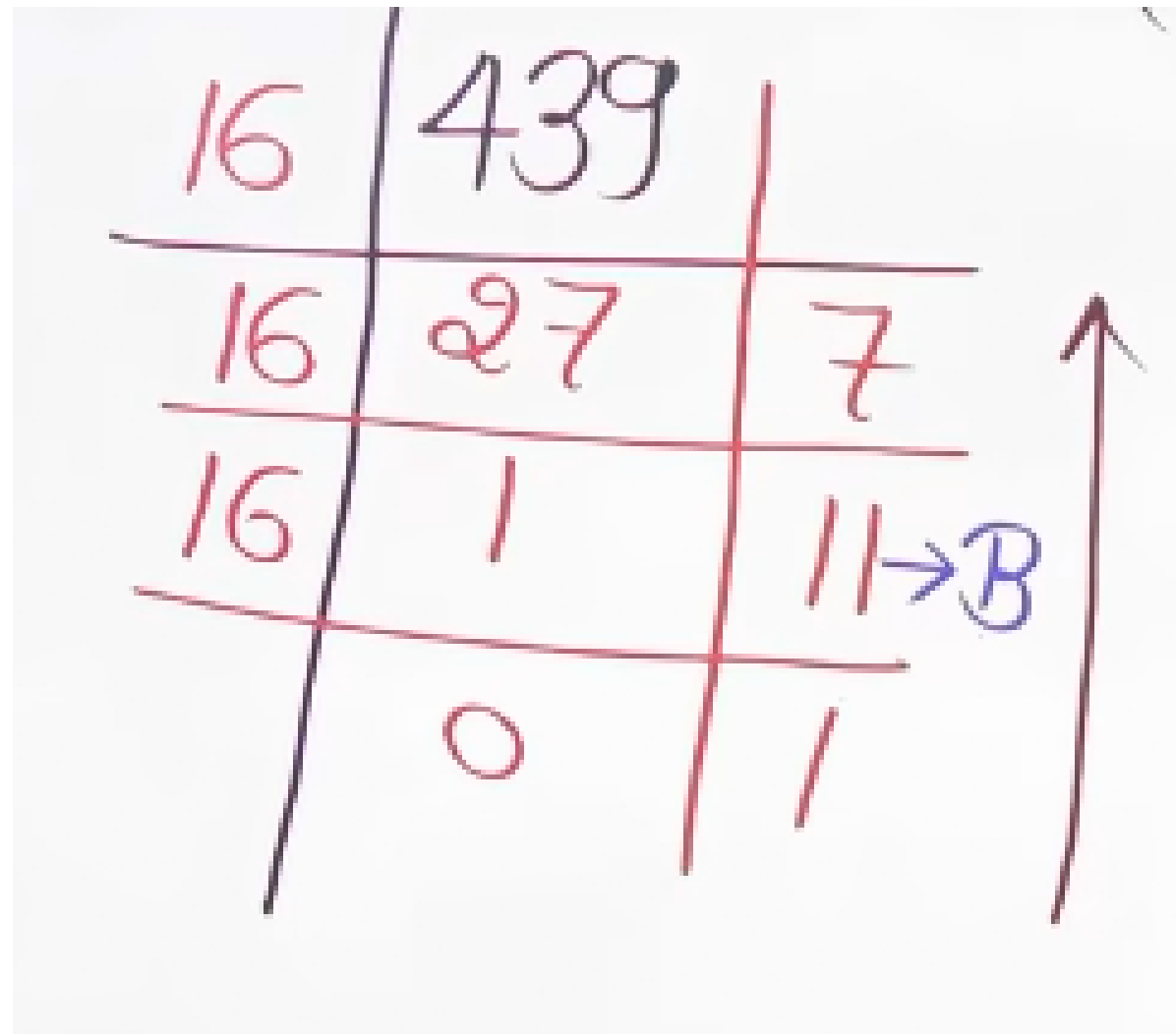
Convert the octal number $(3451)_8$ into its equivalent decimal number ?

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

Decimal to Hexadecimal Conversion

Convert the decimal number 439 into hexadecimal

Answer: 1B7



A handwritten table showing the conversion of the decimal number 439 to hexadecimal. The table has three columns: the divisor (16), the quotient, and the remainder. The remainders are read from bottom to top to form the hexadecimal number 1B7. The remainder 11 is converted to the hexadecimal digit B.

16	439	
16	27	7
16	1	11 → B
	0	1

Hexadecimal to Decimal Conversion

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

$$\begin{array}{ccc} 3 & C & 7 \\ \times & \times & \times \\ 16^2 & 16^1 & 16^0 \end{array}$$

$$768 + 192 + 7$$
$$= (967)_{10}$$

Octal to Binary Conversion

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

$$(6 \quad 1 \quad 3)_8 = (110 \quad 001 \quad 011)_2$$

2^2	2^1	2^0
4	2	1
✓	✓	

Hexadecimal to Binary Conversion

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

$$(5 \quad 2 \quad D)_{16}$$
$$= (0101 \ 0010 \ 1101)_2$$

2^3	2^2	2^1	2^0
8	4	2	1
	✓		✓

Binary to Octal Conversion

Convert the $(101011010)_2$ into octal number
Base $8 = 2^3$

$$\begin{array}{ccc} \overleftarrow{101} & \overleftarrow{011} & \overleftarrow{010} \\ \hline = (532)_8 \end{array}$$

$$\begin{array}{ccc} 101 & 011 & 010 \\ \hline 5 & 3 & 2 \\ \hline 532 \end{array}$$

Binary to Octal Conversion

Binary to Octal Conversion

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

011 101 011



3



5



3



$(353)_8$

Binary to Hexadecimal Conversion

Convert $(1010110101)_2$ into Hexadecimal.

1010 | 1101 | 0101 | 0101

$= (2B5)_{16}$

Hexadecimal to Octal Conversion

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

Binary \rightarrow $(0111\ 1010\ 1011)$

Octal

$= (3653)_8$

8 4 2 1

4 2 1

Hexadecimal to Octal Conversion

94AF

F=15

8 4 2 1

Binary : *(1001010010101111)*

Octal : *112257*

4 2 1

Octal to Hexadecimal Conversion

Convert $(1237)_8$ into Hexadecimal number

Binary (00101001111)

Hexadecimal $= (29F)_{16}$

8 4 2 1

4 2 1

