NUMBER SYSTEM

COMPUTER FUNDAMENTALS

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TOPIC OUTLINE

Number System

Number System Conversion

Adding Number System

NUMBER SYSTEM

NUMBER SYSTEM

Number System	Base/Radix	Digits
Decimal	10	0 to 9
Binary	2	0 and 1
Octal	8	0 to 7
Hexadecimal	16	0 to 9 A to F

Decimal	Binary	Octal	Hexadecimal
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	10	8
9	1001	11	9

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Decimal	Binary	Octal	Hexadecimal
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F

NUMBER SYSTEM CONVERSION

DECIMAL-TO- ANY NUMBER SYSTEM

Successive **division** by the radix until the dividend reaches **zero**.

EXERCISE

Convert $\mathbf{45_{10}}$ to **BIN**.

Q	R

EXERCISE

Convert $\mathbf{328_{10}}$ to **BIN**.

Q	R

EXERCISE

Convert $\mathbf{45_{10}}$ to **OCT**.

Q	R

EXERCISE

Convert $\mathbf{328_{10}}$ to **OCT**.

Q	R

EXERCISE

Convert $\mathbf{45_{10}}$ to **HEX**.

Q	R

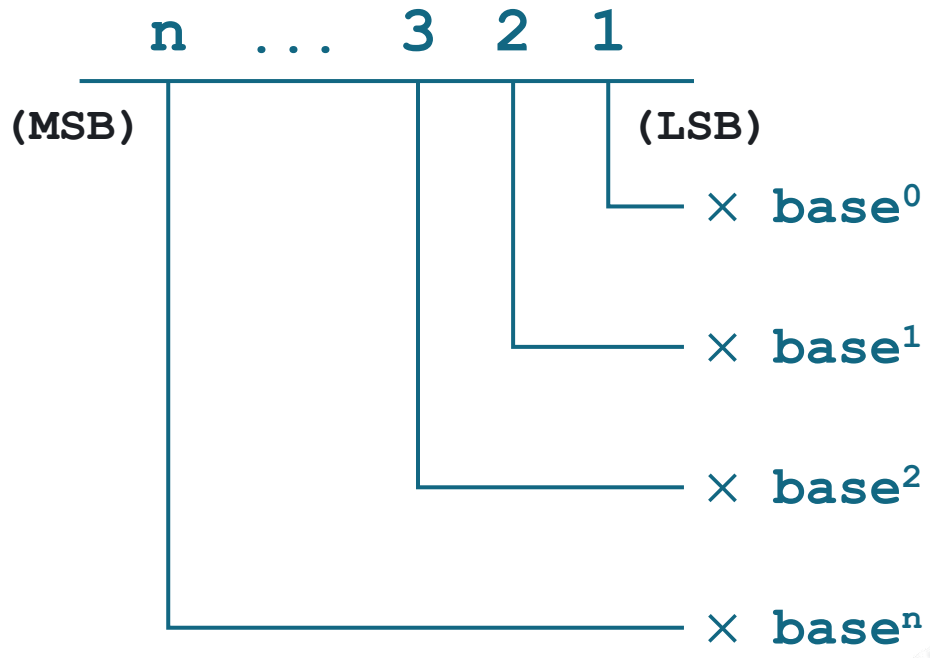
EXERCISE

Convert $\mathbf{328_{10}}$ to **HEX**.

Q	R

ANY NUMBER SYSTEM-TO-DECIMAL

Each digit is multiplied by its **positional notation**.



EXERCISE

Convert $\mathbf{101101_2}$ to **DEC**.

EXERCISE

Convert $\mathbf{101001000_2}$ to **DEC**.

EXERCISE

Convert $\mathbf{55_8}$ to **DEC**.

EXERCISE

Convert $\mathbf{510_8}$ to **DEC**.

EXERCISE

Convert $\mathbf{2D_{16}}$ to **DEC**.

EXERCISE

Convert $\mathbf{148_{16}}$ to **DEC**.

BINARY-OCTAL-HEX

Convert $\mathbf{1011011101_2}$ to **OCT**.

1 Octal digit is equivalent to **3 Bits**

BINARY-OCTAL-HEX

Convert $\mathbf{1011011101_2}$ to **HEX**.

1 Hex digit is equivalent to **4 Bits**

EXERCISE

Convert $\mathbf{742_8}$ to **HEX**.

EXERCISE

Convert $\mathbf{1B6_{16}}$ to **OCT**.

ADDING NUMBER SYSTEM

COUNTING NUMBERS

Decimal Number System:

0,1,2,3,4,5,6,7,8,9...carry 1

Octal Number System:

0,1,2,3,4,5,6,7...carry 1

Binary Number System:

0,1...carry 1

Hexadecimal Number System

0,1,2,3,4,5,6,7,8,9,

A,B,C,D,E,F...carry 1

EXERCISE

$$\begin{array}{r} 17_{10} \\ +\ 15_{10} \\ \hline \end{array}$$

$$\begin{array}{r} 17_{16} \\ +\ 15_{16} \\ \hline \end{array}$$

$$\begin{array}{r} 17_{8} \\ +\ 15_{8} \\ \hline \end{array}$$

$$\begin{array}{r} 1101_{2} \\ +\ 1001_{2} \\ \hline \end{array}$$

EXERCISE

$$\begin{array}{r} 354_8 \\ + \quad 724_8 \\ \hline \end{array}$$

$$\begin{array}{r} 110110_2 \\ + \quad 101111_2 \\ \hline \end{array}$$

$$\begin{array}{r} A5ED_{16} \\ + \quad F73_{16} \\ \hline \end{array}$$

LABORATORY