



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.

DEC	↑	(LSB)
RADIX		(MSB)



EXERCISE

Convert 45_{10} to BIN.

Q	R



EXERCISE

Convert 328_{10} to **BIN**.

Q	R



EXERCISE

Convert 45_{10} to OCT.

Q	R



EXERCISE

Convert 328_{10} to OCT.

Q	R



EXERCISE

Convert 45_{10} to **HEX**.

Q	R



EXERCISE

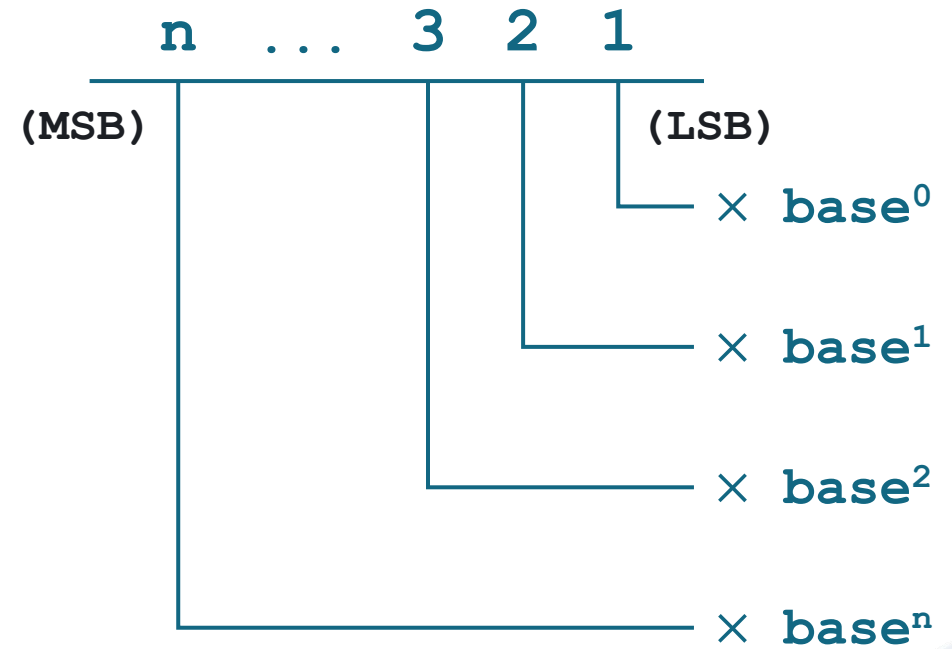
Convert 328_{10} to **HEX**.

Q	R



ANY NUMBER SYSTEM-TO- DECIMAL

Each digit is multiplied by its positional notation.



EXERCISE

Convert 101101_2 to DEC.



EXERCISE

Convert 101001000_2 to DEC.



EXERCISE

Convert 55_8 to DEC.



EXERCISE

Convert 510_8 to DEC.



EXERCISE

Convert $2D_{16}$ to DEC.



EXERCISE

Convert 148_{16} to DEC.



BINARY-OCTAL-HEX

Convert 1011011101_2 to OCT.

1 Octal digit is equivalent to 3 Bits



BINARY-OCTAL-HEX

Convert 1011011101_2 to **HEX**.

1 Hex digit is equivalent to 4 Bits



EXERCISE

Convert 742_8 to HEX.



EXERCISE

Convert $1B6_{16}$ to OCT.



ADDING NUMBER SYSTEM



COUNTING NUMBERS

Decimal Number System:

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

Binary Number System:

0,1...carry 1

Octal Number System:

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

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

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

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



LABORATORY

