CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

Computer Awareness

Part 5

- Funsta Team

Lets Start

CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

Computer Awareness

Part 1 Intro/Generation/ Classification of Computers

Part 2 Computer Architecture & Memory

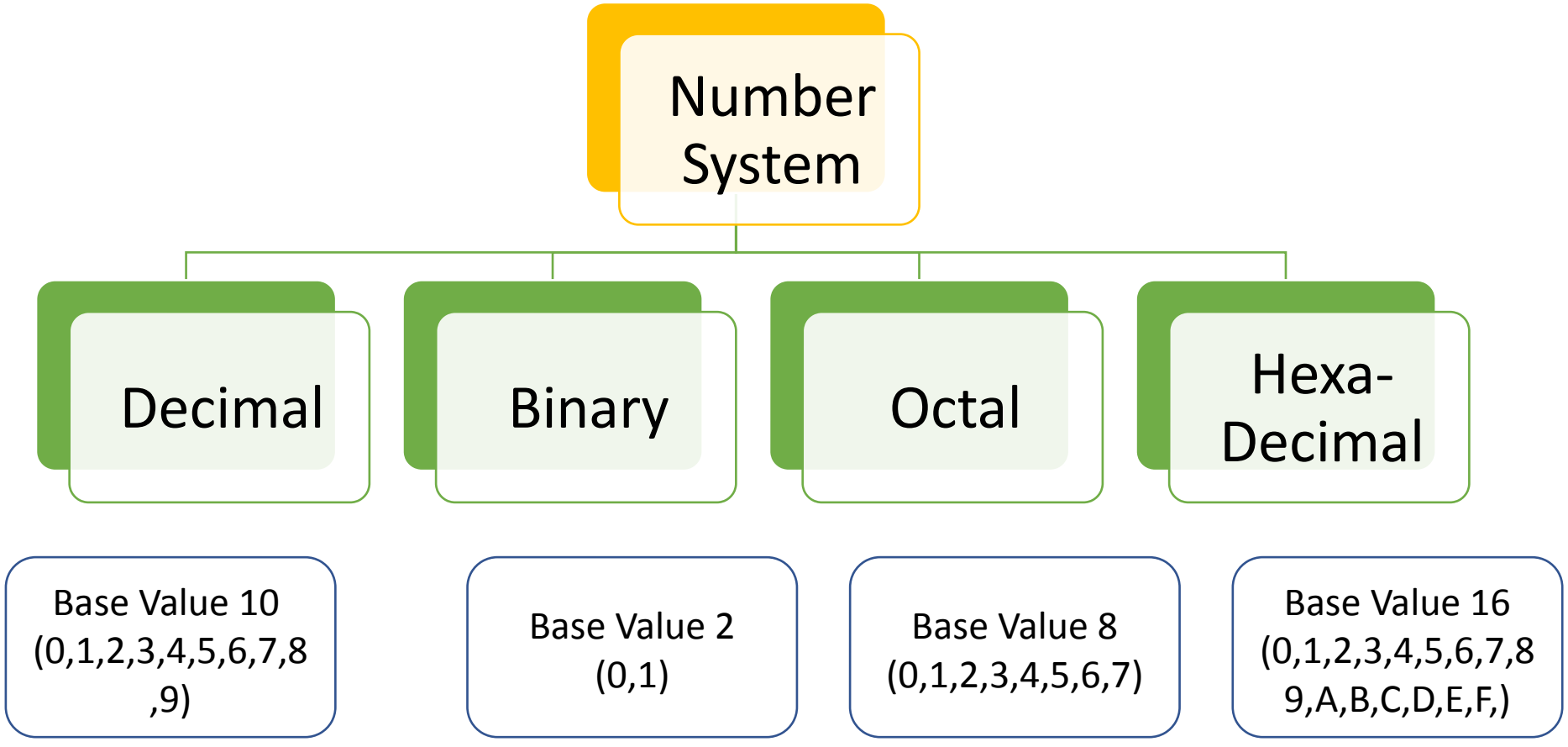
Part 3 Computer Hardware

Part 4 Computer Software and System Utilities

Lets move on to
Next Part

CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

NUMBER SYSTEM



Number System

- The technique to represent and work with numbers is called **Number System**.
- **Decimal Number** system is the most common number system
- Types of Number System:
  - Decimal Number System
  - Binary Number System
  - Octal Number System
  - Hexadecimal Number System

Back to
Main Flowchart

Decimal Number System

- It consists of 0,1,2,3,4,5,6,7,8,9(10 digits).
- It is also called the base 10 system because it makes use of 10 digits.
- The number base is also called the radix
- It is also called the positional value system or the place value notation in which the value of a digit depends on its position.

Back to
Main Flowchart

Binary Number System

- There are only two digits in the Binary system, namely, 0 and 1.
- The numbers in the binary system are represented to the base 2 and the positional multipliers are the powers of 2.
- It is also called as Base 2 system
- The left most bit in the binary number is called as the **M**ost **S**ignificant **B**it (MSB) and it has the largest positional weight.
- The right most bit is the **L**east **S**ignificant **B**it (LSB) and has the smallest positional weight.

Back to
Main Flowchart

Octal Number System

- Octal number system uses digits 0,1,2,3,4,5,6 and 7 (8 digits).
- Each octal digit has its own positional value or weight as a power of 8.
- It is also called as Base 8 system

Back to
Main Flowchart

Hexadecimal Number System

- A hexadecimal number is represented using base 16
- Hexadecimal or Hex numbers are used as a shorthand form of binary sequence.
- Since 16 symbols are used, 0 to F, the notation is called hexadecimal
- The first 10 symbols are the same as in the decimal system, 0 to 9 and the remaining 6 symbols are taken from the first 6 letters of the alphabet sequence, A to F, where A represents 10, B is 11, C is 12, D is 13, E is 14 and F is 15.

Back to Main Flowchart

Conversion Table

Binary, Octal, Hexadecimal equivalent of Decimal Numbers

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0000
1	0001	001	0001
2	0010	002	0002
3	0011	003	0003
4	0100	004	0004
5	0101	005	0005
6	0110	006	0006
7	0111	007	0007

Decimal	Binary	Hexadecimal
8	1000	0008
9	1001	0009
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Octal

4	2	1

Hexa Decimal

8	4	2	1

Back to Index

CONVERSION

Binary

Decimal

Octal

Hexa-Decimal

CONVERSION

CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

Decimal	Binary	Octal	Decimal
Decimal	Octal	Octal	Binary
Decimal	Hexa-Decimal	Octal	Hexa-Decimal
Binary	Decimal	Hexa-Decimal	Decimal
Binary	Octal	Hexa-Decimal	Binary
Binary	Hexa-Decimal	Hexa-Decimal	Octal

Decimal to Binary

Convert $(216)_{10}$ into Binary

2	216	
2	108	0
2	54	0
2	27	0
2	13	1
2	6	1
2	3	0
	1	1

$(216)_{10} = (1\ 1\ 0\ 1\ 1\ 0\ 0\ 0)_2$

Back to Conversion

Decimal to Octal

Convert $(216)_{10}$ into Octal

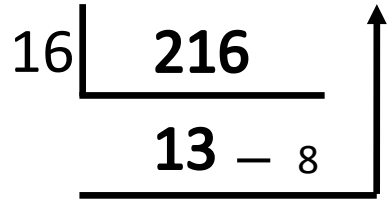
8	216	
8	27	– 0
	3	– 3

$$(216)_{10} = (330)_8$$

Back to Conversion

Decimal to Hexa Decimal

Convert $(216)_{10}$ into Hexa Decimal



$$(216)_{10} = (D8)_{16}$$

Back to Conversion

Binary to Decimal

Convert $(11011000)_2$ into Decimal

$$(11011000)_2 = (2^7 \times 1) + (2^6 \times 1) + (2^5 \times 0) + (2^4 \times 1) + (2^3 \times 1) + (2^2 \times 0) + (2^1 \times 0) + (2^0 \times 0)$$

$$= 128 + 64 + 16 + 8$$

$$= 216$$

Back to Conversion

Binary to Octal

Convert $(11011000)_2$ into Octal

$(11011000)_2 = 011\ 011\ 000$

$011 = (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 3$

$011 = (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 3$ → $(330)_8$

$000 = (0 \times 2^2) + (0 \times 2^1) + (0 \times 2^0) = 0$

Back to Conversion

Binary to Hexa Decimal

Convert $(11011000)_2$ into Hexa Decimal

$$(11011000)_2 = (\quad ? \quad)_{16}$$

1101 1000

$$1101 = (2^3 \times 1) + (2^2 \times 1) + (2^1 \times 0) + (2^0 \times 1) = 13 = D$$

$$1000 = (2^3 \times 1) + (2^2 \times 0) + (2^1 \times 0) + (2^0 \times 0) = 8 = 8$$

$$= D8$$

Back to Conversion

Octal to Decimal

Convert $(330)_8$ into Decimal

330

$8^0 \times 0 = 0$

$8^1 \times 3 = 24$

$8^2 \times 3 = 192$

$(216)_{10}$

Back to Conversion

Octal to Binary

Convert $(330)_8$ into Binary

330

3 = 011
3 = 011
0 = 000

$(330)_8 = (011011000)_2$

Back to Conversion

Octal to Hexa

Convert $(330)_8$ into Hexa

$$330 = \underset{3}{011}\ \underset{3}{011}\ \underset{0}{000}$$

$$= \underset{0}{0}\ \underset{13}{1101}\ \underset{8}{1000}$$

$$= 0\ 13\ 8$$

$$= D\ 8$$

Back to Conversion

Hexa Decimal to Decimal

Convert $(D8)_{16}$ into

$$(D8)_{16} = (16^1 \times 13) + (16^0 \times)$$

$$= 216$$

Back to Conversion

Hexa Decimal to Binary

Convert $(D8)_{16}$ into Binary

$$(D8)_{16} = (D) \mid (8)$$
$$= 1101 \mid 1000$$
$$= (11011000)_2$$

Back to Conversion

Hexa Decimal to Octal

Convert $(D8)_{16}$ into Octal

$$(D8)_{16} = (11011000)_2$$

$$= 011 \mid 011 \mid 000$$

$$3 \quad 3 \quad 0$$

$$= (330)_8$$

Back to Conversion

Extra point for Funsta Family

Decimal ⇨ Binary, Hexa Decimal, Octal

Binary, Hexa Decimal, Octal ⇨ Decimal

Division Method

* base^power

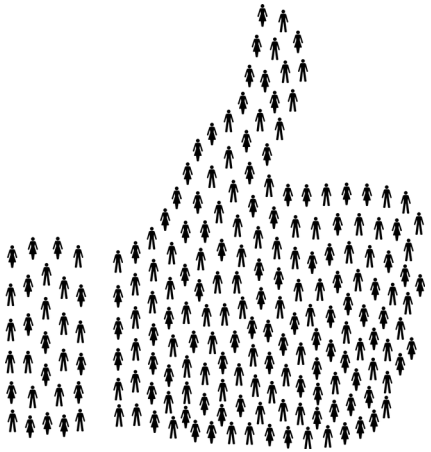
Octal ⇔ Hexa Decimal

Octal → Binary → Hexa Decimal

Hexa Decimal ⇨ Binary → 4 2 1 / 8 4 2 1

Back to Conversion

‘Hurrah!’
We completed this section.



Next Section

Coming Soon...