1. Data Representation

Prefixes

Binary prefix name	symbol	value	Decimal prefix name	symbol	value
Kibi	Ki	2^{10}	Kilo	k	10^3
Mebi	Mi	2^{20}	Mega	M	10^6
Gibi	Gi	2^{30}	Giga	G	10^9
Tebi	Ti	2^{40}	Tera	T	10^{12}

> Overflow: the result of carrying out a calculation which produces a value too large for the computer's allocated word size

Applications

Application of hexadecimal system

- Memory dumps
    - Memory contents are output to printer or monitor
- MAC address
- Error message
- IP address
- Unicode
- Colour in HTML

Application of Binary Coded Decimal (BCD)

- Calculator
- Clock

Character sets

Character set:

- The symbols that computer uses
- A list of characters recognized by computer software and hardware
- Each character has a character code
- The binary code for each character in the string is stored in sequence

Disadvantage of ASCII:

- Only 256 characters can be represented
- Uses values 0 to 127/256
- Many characters in other languages cannot be represented
- The extended ASCII the characters from 128 to 255 may be coded differently in different system.

UNICODE:

- UNICODE has greater range of characters than ASCII
- UNICODE represents most written language in the world, while ASCII does not; used for English only

- ASCII uses 7-8 bits per character, whereas UNICODE uses up to 4 bytes per character
- UNICODE is standardized while ASCII is not