1 Information Representation 信息的表示

1.1 Data Representation 数据的表示

denary numbers 十进制数

also known as decimal numbers, are written using one of the symbols 0~9 for each denary digit.

bit 位

a digit in the binary number system written using either of the symbols 0 and 1.

byte 字节

a group of eight bits treated as a single unit.

nibble 半字节

a group of four bits.

decimal prefix 十进制前缀

a prefix to define the magnitude of a value. Examples are *kilo-*, *mega-*, *giga-* and *tera-* representing factors of 10^3, 10^6, 10^9 and 10^{12} respectively.

binary prefix 二进制前缀

a prefix to define the magnitude of a value. Examples are *kibi*, *mebi*, *gibi* and *tebi* representing factors of 2^{10}, 2^{20}, 2^{30} and 2^{40} respectively.

one's complement 反码表示法

a form of signed integer, in which the binary representation of $-n$ is the bitwise `NOT` of that of n.

two's complement 补码表示法

a form of signed integer, in which the binary representation of $-n$ is the bitwise `NOT` of that of n **plus 1**.

overflow 溢出

a condition when the result of a calculation is too large to fit into the number of bits defined for storage.

binary coded decimal (BCD)

the storage of a binary value representing one denary digit in a nibble.

packed BCD

store two BCD nibbles in one byte.

1.2 Multimedia 多媒体

vector graphic 矢量图

a graphic consisting of drawing objects defined in a drawing list.

drawing object

a component defined by geometric formulae and associated properties (fill colour, line width, etc.).

drawing list

a list contains one set of values for each drawing object.

property 性质

defines one aspect of the appearance of the drawing object.

bitmap image 位图

an image made up of pixels stored in sequence.

picture element (pixel) 像素

the smallest identifiable component of a bitmap image, defined by just two properties: its position in the bitmap matrix and its colour.

colour depth 色深

the number of bits used to represent one pixel.

bit depth 位深

the number of bits used to represent each of the red, green and blue colours.

image resolution 图像分辨率

the number of pixels in the bitmap file defined as the product of the width and the height values.

screen resolution 屏幕分辨率

the product of width and height values for the number of pixels that the screen can display.

file header 文件的标头

a set of bytes at the beginning of a bitmap file which identifies the file and contains information about the coding used.

analogue data 模拟信号数据

data obtained by measurement of a physical property which can have any value from a continuous range of values.

digital data 数字信号数据

data that has been stored as a binary value which can have one of a discrete range of values.

sampling 采样

taking measurements at regular intervals and storing the value.

sampling resolution 采样分辨率

the number of bits used to store each sample.

sampling rate 采样频率

the number of samples taken per second.

1.3 Compression 压缩

compression 压缩

represent the original content of a file with another file of smaller size. Compressed file takes less storage space and can be transmitted in less time using less bandwidth.

lossless compression 无损压缩

compression methods that allow subsequent decoding to recreate exactly the original file.

lossy compression 有损压缩

compression methods that cause some information to be lost so that the exact original file cannot be recovered in subsequent decoding.

Running-Length Encoding (RLE) 游程编码

a lossless compression algorithm that identifies consecutive repeating data and stores the data and the number of times it repeats.