bit – the basic computing element that is either 0 or 1, and is formed from the words Binary digit

binary number system – a number system based on 2 and can only use the values 0 and 1

hexadecimal number system – a number system based on the value 16 which uses denary digits 0 to 9 and letters A to F

error code – an error message generated by the computer

MAC address – standing for Media Access Control, this address (given in hexadecimal) uniquely identifies a device on the internet; it takes the form: NN-NN-NN-DD-DD-DD, where NN-NN-NN is the manufacturer code and DD-DD-DD is the device code NN-NN-NN-DD-DD-DD

IP address – Internet Protocol identified either as IPv4 or IPv6; it gives a unique address to each device connected to a network identifying their location

HTML – HyperText Mark-up Language is used in the design of web pages and to write, for example, http(s) protocols; in the context of this chapter, colours used in web pages are assigned a hexadecimal code based on red, green and blue colours

overflow error – the result of carrying out a calculation that produces a value that is too large for the computer’s allocated word size (8-bit, 16-bit, 32-bit, and so on)

logical shift – an operation that shifts bits to the left or right in a register; any bits shifted out of a register (left or right) are replaced with zeroes

two’s complement – a method of representing negative numbers in binary; when applied to an 8-bit system, the left-most bit (most significant bit) is given the value –128

ASCII code – a character set for all the characters on a standard keyboard and control codes

character set – a list of characters that have been defined by computer hardware and software. The character set is necessary so that the computer can understand human characters

Unicode – a character set which represents all the languages of the world (the first 128 characters are the same as ASCII code)

sampling resolution – the number of bits used to represent sound amplitude in digital sound recording (also known as bit depth)

bit depth – the number of bits used to represent the smallest unit in a sound file

colour depth – the number of bits used to represent the colours of a pixel

sampling rate – the number of sound samples taken per second in digital sound recording

bitmap image – an image made up of pixels

pixel – derived from the term 'picture element', this is the smallest element used to make up an image on a display

image resolution – the number of pixels in the X–Y direction of an image, for example, 4096 × 3192 pixels

pixelated (image) – this is the result of zooming into a bitmap image; on zooming out the pixel density can be diminished to such a degree that the actual pixels themselves can be seen

pixel density – number of pixels per square inch

compression – reduction of the size of a file by removing repeated or redundant pieces of data; this can be lossy or lossless

bandwidth – the maximum rate of transfer of data across a network, measured in kilobits per second (kbps) or megabits per second (Mbps)

lossy (file compression) – a file compression method in which parts of the original file cannot be recovered during the decompression process for example, JPEG, mp3

lossless (file compression) – a file compression method that allows the original file to be fully restored during the decompression process, for example, run length encoding (RLE)

audio compression – a method used to reduce the size of a sound file using perceptual music shaping

MP3 – a lossy file compression method used for music files

MP4 – a lossy file compression method used for multimedia files

JPEG – from Joint Photographic Expert Group; a form of lossy file compression used with image files which relies on the inability of the human eye to distinguish certain colour changes and hues

run length encoding (RLE) – a lossless file compression technique used to reduce the size of text and photo files in particular