











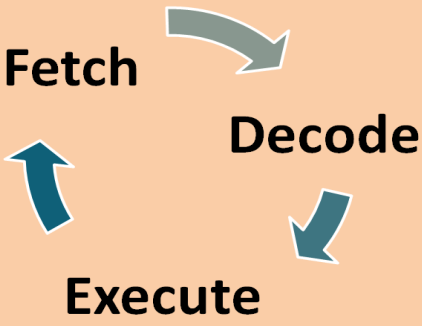


| Devices | | | |
|---|------------------------|----------------------------|--|
| Device | What is it? | Input, Output or Storage ? | What it is used for ? |
|  | Monitor | Output | Displaying images and text |
|  | Mouse | Input | Selecting items on a screen |
|  | CD or DVD | Storage | Storing files e.g. movies |
|  | USB Flash Memory Stick | Storage | Backing up or transferring data from one computer to another |
|  | Keyboard | Input | Creating or editing a document |
|  | Printer | Output | Print work |
|  | Hard Disk Drive | Storage | Storing applications and files |
|  | Speakers | Output | Hearing system sounds / noises / beeps |
|  | Scanner | Input | Scanning important documents to store digitally |
|  | Sim Card | Storage | Storing mobile phone contacts |
|  | Webcam | Input | Using video calling over the Internet |
|  | Headphones | Output | Listening to music |

Fetch – Decode – Execute cycle

- 1. Computer has a list of instructions in memory to carry out
- 2. CPU **Fetches** top instruction from the list
- 3. Instructions is passed to **Decoder** to interpret
- 4. **Decoder** passes on the instruction
- 5. Instruction is **Executed** or carried out
- 6. CPU **Fetches** top instruction from the list...



| What is Binary | | |
|--|---|--|
| Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s. Therefore, all data that we want a computer to process needs to be converted into binary. The binary system is known as a ‘base 2’ system. This is because: There are only two digits to select from (1 and 0) When using the binary system, data is converted using the power of two. | | |
| NAME | EQUAL TO | SIZE IN BYTES |
| Bit | 1 bit | 1/8 |
| Byte | 8 bit | 1 |
| Kilobyte | 1,000 byte | 1,000 |
| Megabyte | 1,000 kilobyte | 1,000,000 |
| Gigabyte | 1,000 megabyte | 1,000,000, 000 |
| Terabyte | 1,000 gigabyte | 1,000,000, 000, 0000 |
| Storage capacities | | |
| Device and capacity | Strengths | Weaknesses |
| USB 6-32GB or more | Easily portable, fast, high capacity storage, durable | Easy to lose. Slower than an internal hard disk |
| INTERNAL HARD DRIVE 1 TB or more | Large storage capacity | Internal hard disks are not portable. External hard disks are not very convenient to carry around and have moving parts so are breakable |
| OPTICAL DRIVE 4GB to 9GB or up to 50GB for rewritable Blu-ray | Large storage capacity, sound and picture quality excellent, cheap | Easily scratched, too large to fit in a pocket |
| SD CARD 8-64 GB, typically | Used in portable devices such as cameras | Easily lost. Not good for long term storage – may deteriorate after several years |
| CLOUD STORAGE Infinite, depending on how much you are prepared to pay | Useful for backup as it is secure, not likely to be lost. Data can be accessed from anywhere, or shared with others | Can be slower to access than data held on a local hard disk |

| Key Terms | |
|-----------------------|---|
| Hardware | Objects that you can touch, like a keyboard. |
| Software | You cannot ‘touch’ software. Software refers to the programs that run on a computer. Examples of software: Windows, MS Word, MS Excel, Kodu and Logo. |
| Input Devices | In computing, an input device is computer hardware which is used to enter data for processing. Examples of input devices include keyboard, mouse, image scanner, digital cameras and joysticks. |
| Output Devices | An output device is any hardware device used to send data from a computer to another device or user. Typical examples of output devices are monitors and projectors (video), headphones and speakers (audio), or printers and plotters. |
| Storage Devices | A piece of computer equipment on which information can be stored. |
| Peripheral | A peripheral device is defined as a computer device , such as a keyboard or printer, that is not part of the essential computer (i.e. the memory and microprocessor). |
| Binary | Binary is a number system that only uses two digits: 1 and 0. |
| Operating System | Manages the hardware and software in a computer (E.g. Windows 10). |
| Systems Software | Software that helps maintain the computer – such as anti-virus or compression (‘Zip’) software |
| Applications Software | Everyday programs such as Microsoft Office, web browsers and graphics packages. |
| Optical media | Refers to discs that are read by a laser. This includes CD-ROMs, DVD-ROMs. |

Devices

| Decimal | Binary | Character | Decimal | Binary | Character | Decimal | Binary | Character |
|---------|----------|-----------|---------|----------|-----------|---------|----------|-----------|
| 32 | 00100000 | space | 64 | 01000000 | @ | 96 | 01100000 | ` |
| 33 | 00100001 | ! | 65 | 01000001 | A | 97 | 01100001 | a |
| 34 | 00100010 | " | 66 | 01000010 | B | 98 | 01100010 | b |
| 35 | 00100011 | £ | 67 | 01000011 | C | 99 | 01100011 | c |
| 36 | 00100100 | \$ | 68 | 01000100 | D | 100 | 01100100 | d |
| 37 | 00100101 | % | 69 | 01000101 | E | 101 | 01100101 | e |
| 38 | 00100110 | & | 70 | 01000110 | F | 102 | 01100110 | f |
| 39 | 00100111 | ' | 71 | 01000111 | G | 103 | 01100111 | g |
| 40 | 00101000 | (| 72 | 01001000 | H | 104 | 01101000 | h |
| 41 | 00101001 |) | 73 | 01001001 | I | 105 | 01101001 | i |
| 42 | 00101010 | * | 74 | 01001010 | J | 106 | 01101010 | j |
| 43 | 00101011 | + | 75 | 01001011 | K | 107 | 01101011 | k |
| 44 | 00101100 | , | 76 | 01001100 | L | 108 | 01101100 | l |
| 45 | 00101101 | - | 77 | 01001101 | M | 109 | 01101101 | m |
| 46 | 00101110 | . | 78 | 01001110 | N | 110 | 01101110 | n |
| 47 | 00101111 | / | 79 | 01001111 | O | 111 | 01101111 | o |
| 48 | 00110000 | 0 | 80 | 01010000 | P | 112 | 01110000 | p |
| 49 | 00110001 | 1 | 81 | 01010001 | Q | 113 | 01110001 | q |
| 50 | 00110010 | 2 | 82 | 01010010 | R | 114 | 01110010 | r |
| 51 | 00110011 | 3 | 83 | 01010011 | S | 115 | 01110011 | s |
| 52 | 00110100 | 4 | 84 | 01010100 | T | 116 | 01110100 | t |
| 53 | 00110101 | 5 | 85 | 01010101 | U | 117 | 01110101 | u |
| 54 | 00110110 | 6 | 86 | 01010110 | V | 118 | 01110110 | v |
| 55 | 00110111 | 7 | 87 | 01010111 | W | 119 | 01110111 | w |
| 56 | 00111000 | 8 | 88 | 01011000 | X | 120 | 01111000 | x |
| 57 | 00111001 | 9 | 89 | 01011001 | Y | 121 | 01111001 | y |
| 58 | 00111010 | : | 90 | 01011010 | Z | 122 | 01111010 | z |
| 59 | 00111011 | ; | 91 | 01011011 | [| 123 | 01111011 | { |
| 60 | 00111100 | < | 92 | 01011100 | \ | 124 | 01111100 | |
| 61 | 00111101 | = | 93 | 01011101 |] | 125 | 01111101 | } |
| 62 | 00111110 | > | 94 | 01011110 | ^ | 126 | 01111110 | ~ |
| 63 | 00111111 | ? | 95 | 01011111 | _ | 127 | 01111111 | del |

Binary can be used to represent characters

- 1) **Alphanumeric characters** are used to make **words** and strings. They include uppercase and lowercase **letters**, the **digits 0 – 9**, and symbols like ? + and £.
- 2) Computers are **unable** to process these characters directly as they only process binary code. So they need a way of **converting** these characters to binary code and vice versa. They can do this using **character sets**.
- 3) Character sets are also contain **special characters** which do certain commands (e.g. enter and delete).
- 4) Pressing a button on your **keyboard** sends a binary signal to the computer telling it which key you pressed. The computer then uses the character set to **translate** the binary code into a particular character.

You can work out the **size** of a text file using this formula

FILE SIZE (IN BITS) = NUMBER OF BITS X NUMBER OF
PER CHARCATER CHARACTERS

Example - a text file that uses 8 bits per character and contains 200 characters will have a file size of **8 x 200 = 1600 bits**

What is Binary

ASCII is the most commonly used character set in the English speaking world.



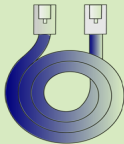

Each ASCII character is given a **7-bit** binary code - this means it can represent a total of 128 different characters including all the letters in the English alphabet, numbers, symbols and commands.

An **extra bit (0)** is added to the **start** of the binary code for each ASCII character. This means each ASCII character fits nicely into **1 byte**.

The codes for numbers, uppercase letters and lowercase letters are ordered (A comes before B comes before C) with symbols and commands scattered around.

| Key Terms (Networks) | |
|----------------------|--|
| Network | A group of devices connected together, either wirelessly or with a network cable. |
| Protocol | A set of rules. |
| Network cable | Used to connect different devices together. They are often made up of a number of wires. |
| Hub | Connects a number of computers together. Ports allow cables to be plugged in from each connected computer. |
| Server | A powerful computer which provides services to a network. |
| Router | Used to connect two separate networks together across the internet. |
| Wired | Wired networks send data along cables. |
| Wireless | Wireless networks send data through the air using radio waves. |
| 3G /4G /5G | Wireless communications standards designed to provide different speeds for mobile devices, such as smartphones, tablets, and wireless hotspots. |
| Wi-Fi | A facility allowing computers, smartphones, or other devices to connect to the Internet or communicate with one another wirelessly within a particular area. |
| Bandwidth | Bandwidth is the amount of data that can be moved from one point to another in a given time. |
| Broadband | A high-capacity transmission technique using a wide range of frequencies, which enables a large number of messages to be communicated simultaneously. |
| Data capacity | How much data the storage type can hold, measured in bits . |
| Buffering | In streaming audio or video from the Internet , buffering refers to downloading a certain amount of data before starting to play the music or movie. |

What am I?



| Wired Versus Wireless | |
|---|---|
| Advantages of a wired network | Disadvantages of a wired network |
| Faster connection (little to no interference) | Cables can be a trip hazard and look unpleasant |
| Higher bandwidth | More expensive and time-consuming to add devices, as each device needs cables |
| Better security | Devices are in fixed positions (no portability) |
| Advantages of wireless network | Disadvantages of wireless network |
| No trailing/trips/hazards | Lower bandwidth |
| It is quick and cheap to connect to new devices | Wireless connections can be weakened by walls and ceilings |
| Allows portability | Less Secure |








| Network Protocols | | |
|-------------------|---|--|
| Layer | Protocols in this layer cover | Protocol Examples |
| 1 | Passing data (as electrical signals) over the physical network | Ethernet |
| 2 | Making connections between networks and directing data | IP (Internet Protocol) |
| 3 | Controlling data flow e.g. checking data is sent and delivered | TCP (Transmission Control Protocol) |
| 4 | Turing data into websites and other applications and vice versa | HTTP / FTP / SMTP |

Part of a website address

URL

http://www.facebook.com

protocolWorld Wide Webdomain name

| Web Browsers / Search Engines / Websites | | |
|--|-------------------|---|
| Browsers | Google Chrome |  |
| | Internet Explorer |  |
| | Safari |  |
| Search engines | Google |  |
| | Bing |  |
| Websites | bbc.co.uk |  |
| | youtube.com |  |

| Key Terms (Internet) | |
|----------------------|---|
| Internet | The internet in a network of networks. |
| Internet Protocol | A set of rules governing the format of data sent over the Internet or other network. |
| IP Address | A unique string of numbers separated by full stops that identifies each computer using the Internet Protocol to communicate over a network. |
| VoIP | Voice Over Internet Protocol - the set of rules that makes it possible to use the Internet for telephone or videophone communication. |
| IoT | A network of Internet connected objects able to collect and exchange data. |
| Spam | Irrelevant or unsolicited messages sent over the Internet, typically to a large number of users, for the purposes of advertising, phishing, spreading malware, etc. |
| WWW (World Wide Web) | Part of the internet that contains websites, web pages, and the links between them. |
| Web Browser | A browser is a software application used to locate, retrieve and display content on the World Wide Web , including webpages, images, video and other files. E.g. Chrome / FireFox |
| Web Server | A web server is a computer that runs websites. The basic objective of the web server is to store, process and deliver web pages to the users. |
| Web Page | A hypertext document connected to the World Wide Web. |
| Search Engine | A type of website that allows you to look up information on the World Wide Web. |
| URL | Uniform Resource Locator (URL) is another name for a web address. |
| HTTPS | Stands for Hypertext Transfer Protocol Secure. This encrypts messages between a browser and the website so the messages cannot be understood by other devices. |
| HTTP | Stands for Hypertext Transfer Protocol. Messages are sent between a browser and a website in plain text and can be read and understood by other devices. |
| Domain Name | A domain name is a unique name that identifies a website . |