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Section 1 : Computer Systems

1.1 System Architecture

Input, process, storage, output	The four main parts of a computer system
Motherboard	The main printed circuit board that holds the different computer components
Process	The part of a computer system that transforms the input into useful output
Input	The part of a computer system that collects and provides the computer system with data or instructions usually via a device such as a keyboard, mouse, sensors etc.
Sensor	A device that can detect a physical property such as heat, sound, light etc.
Von Neumann architecture	The stored-program computer consisting of a CPU, input, output and memory
Register	A data storage area within the CPU
Address	Location in main memory used to store data or instructions
Volatile	The term used to describe memory that requires power to maintain the data stored within it
Bus	A network topology in which all the workstations, servers and printers are joined to one cable
Microprocessor	A CPU on a microchip
Printed Circuit Board (PCB)	A board that supports and connects the components in an electronic circuit
Hardware	The objects that you can actually touch, like disk drives, display screens, keyboards, printers, circuit boards, and chips
Software	Computer instructions or data
Fetch decode execute cycle	The process by which a computer retrieves a program instruction from its memory, determines what actions the instruction dictates, and carries out those actions
Basic Input/Output System (BIOS)	A set of instructions (bootstrap program) that the computer uses to load the operating system (boot up) when it is switched on, placed in non-volatile memory (ROM or flash)
Control unit	The part of a CPU that controls what happens and when in the system. It decodes instructions and tells the PAM, ALU and I/O devices how to respond
Control signals	Electronic signals (high or low) sent by the control unit at every clock cycle to instruct what other parts of the system need to do. For example, there are two connections to RAM. To store data, the Write Enable WE signal would be set high, then the Chip Select (CS#) signal would be set low (#indicates activates low!).
Parallel Processing	A process where computer code is broken into independent parts and processed simultaneously
Control system	A system that typically comprises of a computer or microprocessor, a control program which handles data from sensors and sends signals to output devices
Actuator	Mechanical device that is controlled by computers, e.g. robotic arm
Embedded System	A computer system that forms part of an electronic device
Central Processing Unit	The part of a computer that fetches instructions from main memory (RAM), decodes them for meaning, then executes the commands they represent
Memory Address Register (MAR)	The special register in the CPU that holds the address of the next piece of data to be fetched
Memory Data Register (MDR)	The special register in the CPU that holds the data that has been fetched from memory

Program Counter (PC)	The special register in the CPU that holds the address of the next instruction to be fetched from memory
Arithmetic Logic Unit (ALU)	Part of the CPU that performs all of the arithmetic and logical functions
Accumulator	A register in the CPU for that holds the data being processed by the ALU
Fetch	The part of the fetch decode execute cycle where an instruction is retrieved from main memory (RAM) into the CPU
Decode	The part of the fetch decode execute cycle where the opcode part of the instruction is interpreted for meaning to understand what action is to be carried out
Execute	The part of the fetch decode execute cycle when the CPU carries out the action that is needed
Clock	The part of the CPU that controls the frequency or rate at which the fetch decode execute cycle runs
Clock speed	The factor that determines how many operations a CPU can carry out per second
Cache	The small amount of fast memory located inside or near the CPU which stores copies of the data from frequently used main memory locations
Multicore	A type of CPU that includes two or more processors built into the same chip so that more than one application or process can be executed at the same time (in parallel)?
Dual core	A type of CPU that includes two processors built into the same chip so that two applications or process can be executed at the same time (in parallel)?
Quad core	A type of CPU that includes four processors built into the same chip so that four applications or process can be executed at the same time (in parallel)?
Single core	A traditional CPU chip that includes just one processor so that all open applications only have a share of the total processing time

1.2 Memory

Random Access Memory (RAM)	The place in a computer where the operating system, application programs, and data in current use are kept so that they can be quickly reached by the computer's processor, also known as main memory
Read Only Memory (ROM)	The non-volatile, write only, memory chip in a computer that contains the bootstrap instructions to load the operating system into RAM
Virtual memory	A type of fake main memory that extends the RAM onto the hard disk drive to allow more applications and data to be open
Flash memory	A type of non-volatile memory that can be electronically erased and re-written, used on USB memory sticks, memory cards and SSDs.

1.3 Storage

Peripheral	A computer device, such as a keyboard or printer, that is not part of the main computer
Storage	The part of the computer system that allows either data or instructions to be retained for later use
Floppy disc	A flexible removable magnetic disk (typically encased in a hard plastic shell) for storing small amounts of data
Hard Disk Drive (HDD)	A magnetic media storage device that can store large amounts of data using a rapidly spinning disk coated with a magnetic material, which is accessed via a read/write head on the end of an arm that swings back and forth across the disk, often used for data storage and backup
Portable Hard Disk Drive	A type of HDD that connects to a PC using a USB cable, typically used for backup of standalone PCs

Magnetic tape	A cheap magnetic media that can store large amounts of data using a flexible plastic strip with one side coated with a ferromagnetic material, usually wound between two spools contained in a plastic cartridge, and accessed via the read/write head in a tape drive, often used for data archive
Compact Disc (CD)	An optical media that can store up to 640MB of data on a plastic disc coated with a metal foil layer than can be written to and read from using a laser, often used for backup and archiving small amounts of data (using writable versions), as well as distributing software (using read only versions)
DVD	An optical media that can store up to 4 to 17GB of data on a plastic disc coated with a metal foil layer than can be written to and read from using a laser, often used for backup and archiving data
Solid State Drive (SSD)	A solid state media device containing non-volatile flash memory, used in place of a hard disk because of its much greater speed and durability, due to its lack of moving parts, typically used in smart phones and tablets
Memory stick	A solid state storage device typically of keyfob shape and size, used for storing small amounts of data, typically for moving files between computers for personal use
Memory card	A solid state storage device in a flat card shape, typically for use in portable devices like phones and cameras
Secondary storage	Any non-volatile storage device that is internal or external to the computer
Data Capacity	The amount of data a storage device such as a disk or tape can hold
Optical storage	A storage technology where data is recorded by making marks in a pattern that can be read back with the aid of light, usually laser
Magnetic storage	A storage technology where data is recorded on a magnetic surface by using a pattern of magnetised dots that are created and read back using magnetic fields
Solid state storage	A storage technology that stores and retrieves data using only electronic circuits, without any involvement of moving mechanical parts
Data Access Speed	The speed that data can be read from a storage device
Portability	The measure of how easy it is to move software or hardware between different computer systems
Durability	The ability to able to last a long time without deterioration or damage
Reliability	The ability of a system to operate correctly

1.4 Wired and Wireless Networks

Bandwidth	The amount of data that can be transferred on an internet connection in a given time period, typically measured in megabits per second (Mbps)
Bit Rate	The number of bits per second that can be transmitted between two points on a digital network
Modem	A device that allows a network to send and receive data on telephone or cable lines
Personal area network (PAN)	A computer network used for data transmission amongst devices such as computers, telephones, tablets, personal digital assistants and wearable devices
Microwave	An electromagnetic wave with a wavelength in the range 0.001–0.3 m
Node	The general term for any device connected to a computer network
World wide web (WWW)	An information system on the Internet which allows documents to be connected to other documents by hypertext links
Domain	A group of computers sharing a common part of the IP address
Network	A group of two or more computer systems connected together
Local Area Network (LAN)	A computer network that spans a relatively small area

Hub	A simple connection point for devices on a network that will transmit received packets on any one port to all other ports so all devices on the network can see all packets
Network switch	A connection point for device on a network that uses MAC addresses to forward packets to the correct destination device
Network Interface Card	Circuit board installed into a computer to allow it to connect to networks
Wireless Access Point (WAP)	A hardware device on a network that allows other devices to connect to the network using Wi-Fi
Client-server	Computer network in which one centralized, powerful computer (called the server) has many less powerful personal computers or workstations (called clients) connected to it
Client	Software or hardware that requests services from a server
Server	The central, powerful computer that provides services to clients
Peer-to-peer	A computer network in which all computers are of equal status and there is no server
Wide Area Network (WAN)	A computer network that extends over a large geographical distance
Packet	A 'chunk' or unit of data sent over a network including source address, destination address, and the data to be sent which is known as the payload
Internet Protocol address (IP address)	The unique string of numbers separated by full stops that identifies each computer for addressing communications on a WAN (e.g. the internet)
Ethernet cable	The common network transmission media containing twisted pairs of wires, also known as Cat 5?
Fibre optic	The ultra-fast network transmission media containing thin flexible fibres of glass to transmit light signals
Coaxial cable (Coax)	The older network transmission media containing an inner wire, insulation, and tubular conducting shield
Internet	The world-wide network of interconnected networks
The Cloud	A metaphor to describe the delivery of hosted services over the Internet
Virtual network	A network comprising of separate networks that are connected in such a manner as they function like a single network
Virtual Private Network (VPN)	A technology that creates a secure network connection over a public network such as the Internet
Router	A device that allows separate LANs to be connected
Domain Name Server (DNS)	an internet service that translates domain names into IP addresses
Hosting	To store (a website or other data) on a server or other computer so that it can be accessed over the internet

1.5 Network Topologies, Protocols and Layers

Topology	The way in which constituent parts are interrelated or arranged
Wi-Fi Protected Access (WPA)	The current protocol for secure (encrypted) secure connection to a Wi-Fi network
Media Access Control address (MAC address)	The unique physical address assigned to network interfaces for addressing communications on a LAN
Frequency	The number of times something occurs in one second, measured in hertz (Hz)
Channel	The specific frequency slot a wireless access point is using

Star	A network topology in which each device on the network has its own cable that connects to a switch or hub
Mesh	A network topology in which each device on the network connects to many or all other devices
Wi-Fi	A popular wireless technology that uses radio waves to provide high-speed network connections
Packet switching	Routing of packets through a network based on the destination address contained within each packet
Protocol	The standard set of rules defining how data is should be represented, sent and received on a network
Protocol layers	Individual protocols, each performing a separate task, working together in a protocol stack
Transmission Control Protocol/Internet Protocol (TCP/IP)	The communication protocol of the Internet
File Transfer Protocol (FTP)	The commonly used protocol for exchanging files over the Internet
Post Office Protocol (POP)	A older protocol used to retrieve e-mail from a mail server
Internet Message Access Protocol (IMAP)	The protocol that allows synchronisation of emails and email folders between the email server and multiple client devices
Simple Mail Transfer Protocol (SMTP)	The common protocol for sending e-mail messages
HyperText Transfer Protocol (HTTP)	The protocol that defines how messages are formatted and transmitted on the World Wide Web
Encryption	The purpose of scrambling data so it can be sent securely over networks
HTTP Secure (HTTPS)	A protocol for secure (encrypted) communication over a computer network which is widely used on the Internet

1.6 System Security

Antivirus	A security utility designed to detect and destroy computer viruses
Spyware	Malicious software that enables a user to obtain covert information about another's computer activities by transmitting data covertly from their hard drive
Antispyware	A security utility designed to detect and destroy spyware
Hacking	The use of computers to access data without authorisation
Adware	Software that contains advertisements embedded in the application
Backup policy	A pre-defined, set schedule of backups
Blagging	to fool an individual or business into disclosing private information
Pharming	The fraudulent practice of directing Internet users to a bogus website that mimics the appearance of a legitimate one, in order to obtain personal information such as passwords, account numbers, etc.
Shouldering	Using direct observation techniques, such as looking over someone's shoulder, to obtain information
Trojan	A malicious computer program which is used to hack into a computer by misleading users of its true intent
Worm	A malware computer program that replicates itself in order to spread to other computers

Zero-day attack	An attack on a security hole which is exploited by hackers before the vendor becomes aware and hurries to fix it
Virus	A program or piece of code which is capable of copying itself and typically has a detrimental effect, such as corrupting the system or destroying data
Utility	A small program within the operating system designed to carry out a specialised task such as security, disk organisation or maintenance
Encryption software	Utility software that allows the encryption of files
Compression software	Utility software used for compressing data files
Backup software	Utility software that allows the full or incremental backup of data files
Full backup	The method of backup where all the files and folders selected for the backup will be backed up
Incremental backup	The method of backup that includes only those files which have been altered since the last full backup
Firewall	A security utility designed to prevent unauthorized access to or from a personal computer or private network
Malware	Software which is specifically designed to disrupt or damage a computer system
Phishing	The fraudulent attempt, usually made through email, to steal your personal information
Social engineering	A human interaction, tricking people into breaking normal security procedures, including phishing and blagging
Denial of service attack	An attempt to make a machine or network resource unavailable to its intended users
Data interception	The unauthorised reading of packet contents on a network, in order to gather sensitive information
SQL Injection	The malicious addition of SQL code to a Web form input box, to gain access to private information or make changes to data
Penetration testing	The authorised attack on a computer system that looks for security weaknesses
Network forensics	The monitoring and analysis of network events and data in order to discover the source of security attacks or other problem incidents
anti-malware software	Programs designed to identify and prevent malware
user access level	the privileges given to a user to perform certain actions on a computer system
Brute Force Attack	An automated trial-and-error attack used to repeatedly guess passwords, most effective on passwords which may be short or use words taken or modified from a dictionary
Password policy	A set of rules for user passwords on a network, typically including password history, age, length, and complexity, including the requirement for characters and numbers
Backup	A copy of a data so that it may be retrieved either individually or as part of a disaster recovery
Acceptable Use Policy (AUP)	A document stipulating constraints and practices that a user must agree and sign-up to before access to a network or the internet is granted

1.7 Systems Software

Processor management	How the CPU ensures that each process and application receives enough of the processor's time to function properly
Operating System	The first program that is loaded into the computer using a bootstrap program, that is that used to run other programs
Peripheral Management	Operating system software which controls peripheral devices by sending them commands in their own computer language

Memory Management	Operating system software which automatically handles the changing memory requirements of programs
Multitasking	To execute more than one program simultaneously
Defragmenter	A disk organisation utility that locates data fragments on a storage media and reorganises them so data from the same file are contiguous (next to each other) for improved speed of data retrieval
User management	Operating system software for adding users and setting their user access levels
File management	Operating system software for viewing, renaming, moving and copying files
Virtual machine	An operating system that is installed on software, which imitates dedicated hardware
Utility programs	A program for carrying out a routine function
Device drivers	A program that controls a particular type of device that is attached to your computer
Time slice	A short interval of time during which a computer or its central processor deals uninterruptedly with one user or program, before switching to another
User interface	The means by which a user can interact with a computer system
Graphical User Interface (GUI)	Allows users to communicate with a computer system using icons and menus
Command line interface	User interface which requires instructions to be written in text, one at a time

1.8 Ethical, Legal, Cultural and Environmental Issues

Piracy	Unauthorised copying of computer software or media
Copyright	The exclusive right to make copies, license, and otherwise exploit a literary, musical, or creative work, whether printed, audio or video
Plagiarism	The practice of taking someone else's work or ideas and passing them off as one's own.
Intellectual property	Something unique that you physically create and may wish to protect using copyright law
Carbon Footprint	The amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community
Data centre	A facility used to house computer systems
Digital divide	The gap between those who have ready access to computers and the Internet, and those who do not
e-waste	Discarded electronic appliances such as mobile phones, computers, and televisions
Patent	The exclusive right granted by a government to an inventor to manufacture, use, or sell an invention for a certain number of years
Copyright, Designs and Patents Act 1988	The current UK copyright law that protects copyright holders against the theft of their intellectual property
Creative Commons Licensing	A copyright licence that gives the right to share, use, and build upon a piece of software
Freedom of Information Act 2000	The UK law that provides public access to information held by public authorities
The Data Protection Act 1998	The UK law defining the ways in which information about living people may be legally used and handled
Computer Misuse Act 1990	The UK legal Act preventing the use of computers for crime or malicious purposes
Ethics	The moral code of practice to be fair and considerate of other people
Legal	Relating to the law
Cultural	Relating to the customs and beliefs of specific groups of people

Environmental	Relating to the natural world and the impact of human activity on its condition
Privacy	ability of an individual to protect information about themselves
Stakeholder	An individual that has an interest in an enterprise or project
Proprietary	A type of software that gives no access to the source code, and has a licence that restricts the copying, modification and distribution of the software
Open source	a type of software that makes the source code openly available to others to use and modify

Section 2 : Computational thinking, algorithms and programming

2.1 Algorithms

Output	The part of a computer system where information or data obtained via processing is presented to the user on the monitor or turned into useful action e.g. triggering an alarm, turning a motor etc.
Trace table	A table that records the values of variables and conditions as the steps of the code are followed, used to check for logic errors and also known as a 'dry run'
Computational Thinking	Solving a computational problem using techniques including decomposition, pattern recognition, abstraction and algorithmic thinking
Pattern recognition	The part of computational thinking where we look for the similarities or patterns among small, decomposed problems that can help us solve more complex problems more efficiently
Ordered list	A list of items in either ascending or descending order
Unordered list	A list of items in no particular (random) order
Subroutine	A procedure or function
Call	A command to execute a function or procedure. In the case of a function, the value will be returned
Arguments	The list of inputs when calling a subroutine with parameters
Parameter	A special kind of variable, used in a subroutine to refer to one of the pieces of data provided as input to the subroutine
Ascending order	An order arranged from the smallest to the largest
Descending order	An order arranged from the largest to the smallest
Top-down problem solving	An approach to integrated testing where the top integrated modules are tested and the branch of the module is tested step by step until the end of the related module
Bottom-up problem solving	An approach to integrated testing where the lowest level components (modules, procedures, and functions) are tested first, then integrated and used to facilitate the testing of higher level components
Structured programming	Programming techniques that use functions, procedures and modules to organize the programming code
Module	A group of functions and procedures for a specific purpose
Pseudocode	A notation resembling a simplified programming language with no formal rules of syntax, used in program design
Flowchart	A type of diagram that represents an algorithm, showing the steps as boxes of various kinds, and their order by connecting them with arrows
Algorithm	A set of steps to be followed in order to solve a problem
Abstraction	The branch of computational thinking where we simplify by identifying the general characteristics and to ignore unnecessary details
Decomposition	The branch of computational thinking where we break down a complex problem into smaller easy to solve parts

Algorithmic thinking	The branch of computational thinking where we consider what rules or steps are required to solve a problem
Binary search	A method of searching an ordered list whereby an ordered list is recursively bisected until the desired element is found
Linear search	A search that checks every element in the list sequentially until the desired element is found
bubble sort	A simple sorting algorithm that repeatedly steps through the list to be sorted, compares each pair of adjacent items and swaps them if they are in the wrong order
merge sort	A sorting algorithm that repeatedly halves the list to be sorted, then merges the pieces together in the correct order
insertion sort	A simple sorting algorithm that builds the final sorted array one item at a time by inserting each item in the correct position

2.2 Programming Techniques

Database Management System	Software for creating and managing database
Definite iteration	A method of iteration where the number of iterations can be known before the loop begins
Indefinite iteration	A method of iteration where the number of iterations cannot be known before the loop begins
For... loop	A method of count controlled iteration which repeats a set of statements for a known number of times
While... loop	A method of condition controlled iteration which will repeatedly execute a set of statements only while a Boolean condition continues to be met
Do...until...loop	A method of condition controlled iteration which repeatedly executes a set of statements until a Boolean condition is met
Nested loop	A loop within a loop, featuring an inner loop within the body of an outer loop
Nested if	An if statement inside another if statement
Infinite loop	A loop that will continue until forcibly interrupted, e.g. "while True"...
Algorithm efficiency	The properties of an algorithm which relate to the amount of computational resources used by the algorithm
Flow of control	The order function calls, instructions, and statements are executed or evaluated when a program is running
Identifier	A unique name given to a variable, constant, object, function or procedure
Global variable	A variable that be accessed from any part of the code
Local variable	A variable that can only be accessed within a single procedure
Cipher	A method of encrypting text
Concatenation	The joining two strings into one
Data structure	The method of organizing and storing data including arrays, files, records, tables and trees
Floating point number	A number with a decimal point whose location is not fixed
String traversal	The iteration through each character of a string
Boolean operations	The set of operations used in Boolean algebra and logic gates including AND, OR and NOT
Boolean logic	The branch of algebra in which the values of the variables are true or false, usually denoted 1 and 0 respectively
Logic circuit	A combination of logic gates used to fulfil more complex logic problems
Record	All of the information about one person or thing in a database, often displayed as a single row in a table

Structured Query Language (SQL)	The standard language used to communicate with a database
Query	A SQL request made to a DBMS to select, update or delete data matching a specific criteria
Sequential program	A series of instructions that never branch and will always be completed in the given order
Selection	A branching statement controlled by a condition or conditions (e.g. IF and CASE statements) that determine which of two or more sequences of statements are executed
Iteration	A statement that causes a sequence of statements to be repeated a number of times, (e.g. FOR, WHILE and REPEAT statements) usually dependent on a given condition
Variable	A named space in main memory (RAM) that contains a value that can be changed during the execution of the program
Assignment	The process of setting the value of a variable
Constant	A named space in main memory (RAM) that contains a value that cannot be changed during the execution of the program
Integer	A datatype that can contain only whole numbers
Real	A datatype that can contain only decimal numbers, known as a float datatype in Python
Boolean	A datatype that can contain only the values True or False
Character	A datatype with a size of exactly one byte that is used to represent a single extended ASCII character
String	A datatype used to contain a finite sequence of characters (i.e. letters, numerals, symbols and punctuation marks)
String manipulation	The fundamental operations on strings
Arithmetic operations	The set of operations used in basic mathematics including addition, subtraction, multiplication, division, exponentiation, quotient and modulus
Array	A series of values of the same datatype stored in a sequence, known as a list in Python
Two dimensional array	A set of values of the same datatype stored in a list with two columns
Operator	The character that represents an operation e.g. arithmetic (+), Boolean (AND) or comparison (>=)
File handling	The fundamental operations on a file including open, read, write and close
Function	A section of a program (subroutine) that performs a specific task and returns a value as a result
Procedure	A section of a program (subroutine) that performs a specific task but does not return a result
Datatype	A classification identifying one of various types of data, such as real, integer, string or Boolean
Casting	Changing an entity of one datatype into another
Nested operations	Operations that use brackets to perform many operations in one statement, requiring the use of BIDMAS to evaluate correctly

2.3 Producing Robust Programs

Evaluation	The process where we make sure our solution does the job it has been designed to do and to think about how it could be improved
defensive design	The design for when things go wrong, including planning for contingencies and anticipating misuse
input sanitisation	A type of validation that ensures input data is safe for use, for example removing SQL syntax

authentication	Process by which a system verifies the identity of a User who wishes to access it, typically using a username and password
maintainability	The ease with which a software system or component can be modified to correct faults
comments	A text note added to source code to provide explanatory information, usually about the function of the code
indentation	Adding spaces or tabs in front of blocks of code to make it easier for you and others to see how the code flows
final testing	The stage after beta testing, where software is tested on the general public!
test data	Data used in a test plan including valid data, invalid data and extreme data
Extreme data	Data used for boundary tests at the extreme ends of value ranges, for example input 10 when a condition checks for a value being between 1 and 10
Presence check	A type of data validation that will reject any attempt to leave the entry field blank
Range check	A type of data validation that ensures numeric or date/time data is within a valid range
Length check	A type of data validation that ensures string inputs contain a valid number of characters
Transcription error	An error caused by entering data incorrectly e.g. 'Smyth' instead of 'Smith'
iterative testing	A design methodology based on a cyclic process of prototyping, testing, analysing, and refining
alpha testing	In-house testing that is carried out when the code is roughly ready
beta testing	The stage after alpha testing, where software is tested by a group of external volunteers
Systems development cycle	A process for planning, creating, testing, and deploying an information system
Implementation	All the post-sale processes including installation, testing and user training. Also known as deployment
Check digit	An extra digit added to a number to confirm its validity. The check digit is validated using an algorithm e.g. the Modulus 11 algorithm.
Invalid	Data that is not of an allowed value, e.g. outside of the required range or of the wrong length or format (pattern of characters) and must be dealt with. Also known as erroneous data.
Valid	Data that is within the required range and of the format expected by the program. Also known as normal data.
Validation	An automatic check to ensure that the data entered is sensible and reasonable
Syntax error	A error in a program produced by not following the syntax of the language
Logic error	A error in a program that causes it to function incorrectly, but not to terminate abnormally or crash
Test plan	A table used to demonstrate that a program functions as intended by planning specific input combinations, and comparing the actual output to the desired output
Boundary test	A test that can be used to check that programs function correctly using extreme data

2.4 Computational Logic

Transistors	The tiny electronic components in a computer system that can be switched ON or OFF by using electronic voltage signals
Logic Gate	The building block of a computer system, made from transistors, usually including two inputs that control its binary condition between ON (1) or OFF (0)
NOT gate	A single input logic gate which produces an output signal only when there is not a signal on its input

AND gate	A logic gate which produces an output signal only when signals are received simultaneously through all (usually two) input connections
OR gate	A logic gate which produces an output signal when signals are received on any one or more of its input connections
Comparison operations	The set of operations where the first operand is compared to the second operand, including ==, <, >, <>, <= and >=. Also known as relational operations
Truth table	A table identifying all the possible input and output values of a logic gate or circuit
AND	A logical operation to be used when selecting on the basis that both of two separate conditions must evaluate True
OR	A logical operation to be used when selecting on the basis that either one or both of two separate conditions must evaluate True
NOT	A logical operation to be used when selecting on the basis that a condition evaluates False
Modulus	The arithmetic operation that divides the first operand by second operand and returns remainder
Exponent	The arithmetic operation where the first operand is raised to the power of the second operand

2.5 Translators and Facilities of Languages

Instruction	An order for a computer to follow consisting of an opcode and operand
Opcode	A binary code at the left hand side of an instruction representing which command or operation is to be carried out, e.g. add or subtract
Operand	A binary code at the right hand side of an instruction representing which value or address in RAM is to be used in the operation
Assembly language	A low level language that uses short mnemonics to represent the CPU machine code instructions
Instruction set	The complete set of all the instructions in machine code that can be recognized and executed by a central processing unit
Mnemonic	An abbreviation for an operation e.g. BRP for BRANCH IF ZERO OR POSITIVE
debug	To identify and remove errors from computer software
1st generation language	The generation of machine-level programming language such as machine code
2nd generation language	The generation of assembly languages
3rd generation language	The generation of high-level computer programming languages
Applet	A small application written in java to run within a web page
High level language	a human readable computer programming language that resembles natural language and mathematical notation
Low level language	a machine readable computer programming language that closely matches the CPU instruction set, for example assembly language and machine code
Machine Code	A the lowest level language where each instruction is represented in binary (0s and 1s) for processing by the CPU
Translator	A program that converts a program into a functionally equivalent program in a different language
Assembler	A translator program that converts assembly language into machine code
Compiler	A translator program that converts a high level language into machine code
Interpreter	A translator program that can analyse and execute a program line by line, often used in IDEs for debugging

Integrated Development Environment	Programming environment that has been packaged as an application program, typically consisting of a code editor, syntax checking, auto-completion, translators (interpreter and compiler), runtime environment and auto-documentation
Runtime environment	Software that allows you to execute code within the IDE. Features include line-by-line execution (stepping), and debugging information such as variable values.
Auto Documentation	Software feature used to generate written information about the source code
Syntax	The set of rules that defines the combinations of symbols that are considered to be a correctly structured code
Auto-completion	The feature of an IDE whereby as you start to type the first part of a statement it suggests or completes the statement and any arguments or variables
Statement	The smallest fragment of computer code that expresses what is to be carried out, for example an IF statement, which when compiled may result in several instructions in machine code

2.6 Data Representation

Analogue	This sound recording method has continuously changing values
JPEG (.jpg)	The 24-bit colour depth image format that uses lossy compression, commonly used for digital photos
GIF (.gif)	The 8-bit colour depth image format that uses lossless compression, commonly used for simple images like clipart, logos, and also allows simple animations
MP3 (.mp3)	The lossy compression format for Audio files, especially those downloaded from the internet
Number base	The number of unique digits, including zero, used to represent numbers in a place value system
Place value	The numerical value that a digit has by virtue of its position in a number
Binary shift	A bitwise process where each bit is shifted to the left or right by a given number of places
bit	A binary digit (0 or 1)
nibble	Four binary digits, four bits
byte	Eight binary digits, eight bits
B	The symbol for byte
kilobyte	A unit of memory or data equal to 1,024 bytes
KB	The symbol for kilobyte
megabyte	A unit of memory or data equal to 1,024 kilobytes
MB	The symbol for megabyte
gigabyte	A unit of memory or data equal to 1,024 megabytes
MB	The symbol for megabyte
terabyte	A unit of memory or data equal to 1,024 gigabytes
TB	The symbol for terabyte
petabyte	A unit of memory or data equal to 1,024 terabytes
PB	The symbol for petabyte
binary	The base 2 numbering scheme used to represent all data in a computer system
denary	The base 10 numbering scheme used in our everyday lives, also known as decimal
Hexadecimal	The number system in base 16 that can be easily converted into binary
Overflow	The error that occurs when a number becomes too large to fit into the number of bits allocated
ASCII	the common character set that uses a 7-bit binary number to represent each of 128 possible characters
Extended ASCII	The common 8-bit character set used to represent each of 256 possible characters

Unicode	The 16-bit character set designed to cover all the world's major living languages (more than 65,000 characters)
Character set	A defined list of characters recognized by the computer hardware and software for display and printing
pixel	Short for Picture Element, the smallest unit of colour that makes up a graphic image or screen
metadata	The extra information stored in a file such as height, width and colour depth, meaning data about data
colour depth	In a digital image, the number of bits used to indicate the colour of a single pixel, also known as bit depth
resolution	The total number of pixels in a digital image expressed in terms of pixels wide x pixels high
Sampling	The conversion of a continuous sound wave to a discrete sequence of binary numbers
Sample interval	In sampling, the amount of time between samples
Sample frequency	In sampling, the number of samples taken per second
Bit depth	In sampling, the number of bit used to encode each sample. Also known as sample size.
Compression	The re-encoding of data to reduce the number of bits so that it may occupy less space in storage or be transmitted more quickly over networks, especially the internet
Lossy	A compression method that results in lost data and quality from the original version, so the compressed data is an approximation of the original data
Lossless	A compression method that allows the original data to be perfectly reconstructed from the compressed data