Y9_ Spring Term 1: Algorithms

Key Vocabulary…

Term	Definition
Computational Thinking	Thinking in a logical way.
Abstraction	Picking the important bits of infomration out of a problem.
Decomposition	Breaking a bigger problem into subtasks, making it easier to complete.
Algorithm	A step-by-step set of precise instructions
Linear Search	A searching algorithm that checks each item in a list until it finds what it is looking for. Can be very slow.
Binary Search	A searching algorithm that looks for an item in a sorted list. It works by comparng it with the middle value and deciding if it is higher or lower. It repeats this process until the item is found.
Bubble Sort	An algorithm used to sort out a list by comparing two values next to each other and swapping them over if needed.
Merge Sort	Divide and conquer algorithm where the list is split and then merged back together.
Insertion Sort	A sorting algorithm that move the item along a list until the item is put in the correct position in the list.
Sequence	Tasks that are carried out one after another.
Selection	A decision has to be made before the program flow can continue.
Iteration	Tasks are repeated in a loop.

Picture This…

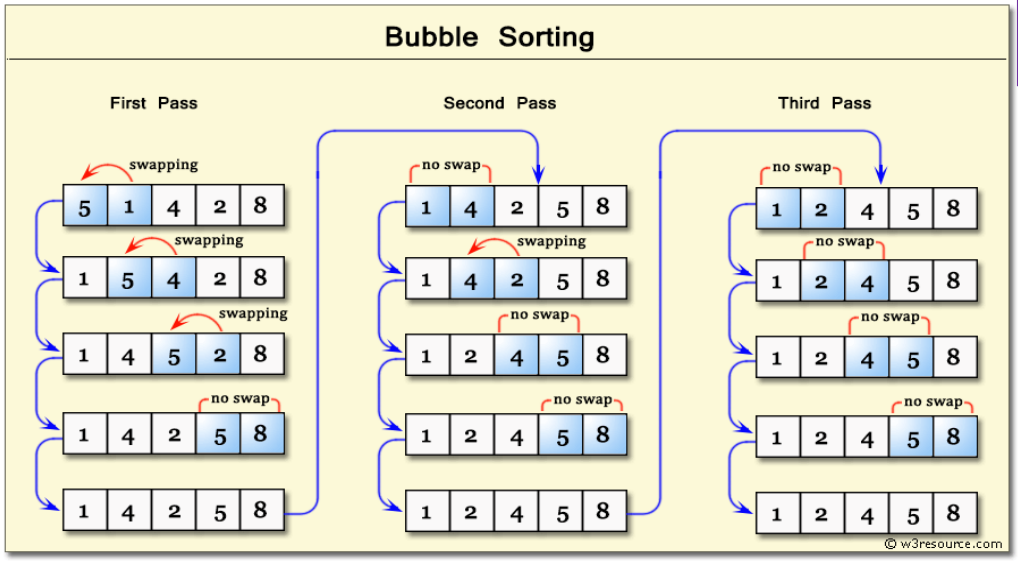
Linear Search

Figure 1 - Linear search example

Binary Search

Figure 2 - Binary search example

Linear searches can be slower than a binary search if the item is further down the list as it will have to check through all of the items in the list to find the target.



Bubble sorts check each item next to each other and then swap them if they are smaller. In a Bubble sort the largest number will always be at the end of the list. You may need to go through the list more than once – this is known as a Pass

Deep Learning

Sorted data is easier for a computer to work with. You can write this all of these algorithms out in Python or another high-level code on a computer to see how they work.
There are a lot of YouTube tutorials available to watch and then you can code along with them.

Activity – Research the difference between symmetric encryption and asymmetric encryption.

Y9_ Spring Term 2: Laws and Ethics

Key Vocabulary…

Term	Definition
Ethical Issue	Something which might not be morally correct.
Environmental Issue	How computers can affect the natural world through e-waste.
Cultural issue	How different groups of people might be affected by an issue.
Stakeholder	Someone has an interest in a business or issue.
Digital Divide	The gap between people who have access to technology and those who don't.
Non-renewable resources	Resources that once used can't be used again.
Computer Legislation	Rules that are set out to govern how computers are used.
Data Protection Act (2018) GDPR – EU	A set of laws that controls how people's personal data is held.
Freedom of Information Act (2000)	Allows members of the public to access data held about them from organisations.
Computer Misuse Act (1990)	Laws which stop users using computers illegally such as hacking.
Copyright, Designs and Patents Act (1988)	Law to protect the intellectual property. This stops someone's idea, such as a game design being stolen.
Creative Commons License	A license which lets you use someone's work as long as they have put a CC license on the work.
Cyberbullying	Intentionally hurting someone by name calling or teasing using social media or text messages.

Picture This…

Data should be obtained lawfully

Data should only be used for specific purpose

Data should not be excessive- only hold what is needed

Data should be up to date

Data Protection Act (2018)

Data should not be kept longer than necessary

Data should not leave EU.

Data must be kept secure so it can't be stolen.

People are allowed to ask to see data held about them.

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Remember - legislation

Computer Misuse Act(1990)

Makes it illegal to…..

1. Gain unauthorised access to computer systems such as files.
2. Steal material that you don't have access to.
3. Break into a computer system and deliberately destroy files.

Questions

1. Give two cultural issues that surround technology.
2. Give a positive/negative impact that technology has on the environment.
3. How many principals does the data protect act have?
4. What is personal data?
5. What is the main purpose of the data protection act?
6. What happens if a company breaks the data protection act?

Deeper Learning…

Computer technlogy is changing our lives as communication becomes more instant and more data is held about us. Social networks allow people to publish and upload thoughts, stories and images on a wider scale. Medical advances have happened too, and we can monitor our bodies and transmit the data online.
AI is now a common experience with driverless cars and automated technology being developed. Do you think that this anything we should worry about?

Activity – Many organisations provide free public access to a wireless network. Explain THREE ethical, legal or data privacy issues that an organisation should be aware of when allowing this access.