

an algorithmic solution to a problem

How to solve a problem

Algorithm

A finite sequence of instructions that can be executed by a computer to solve a problem.

Algorithmic thinking is a way of thinking that involves breaking down a problem into smaller, more manageable parts and then solving each part in a systematic way.

Algorithmic thinking is a key skill in computer science and is used in many other fields as well.

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Old / New / Why

Why

What is Algorithm?

- Set of Instructions (Sequentially) to solve problem/perform task
- It is a step by step procedure to solve a problem. It is a sequence of instructions that can be executed by a computer to solve a problem.



What is Data Structure?

- It is a way to organize data for storage.
- It is a collection of data elements and the relationships between them.



Algorithm Design Techniques



Brute Force

It is a simple and naive algorithm. It tries all possible solutions to a problem and returns the first one that satisfies the condition.



Greedy Approach

It is a simple and naive algorithm. It makes a choice at each step that seems to be the best at the moment.



Divide and Conquer

It is a simple and naive algorithm. It breaks a problem into smaller sub-problems and solves each sub-problem separately.



Dynamic Programming

It is a simple and naive algorithm. It stores the results of sub-problems and uses them to solve the main problem.



Backtracking

It is a simple and naive algorithm. It tries all possible solutions to a problem and returns the first one that satisfies the condition.



Heuristic

It is a simple and naive algorithm. It makes a choice at each step that seems to be the best at the moment.



Graphs

A graph is a collection of nodes and edges. It is used to represent a network or a system.



Trees

A tree is a graph with no cycles. It is used to represent a hierarchy or a system.



Algorithms

An algorithm is a set of instructions that can be executed by a computer to solve a problem.



Complexity

Complexity is a measure of the amount of resources (time and space) required to solve a problem.



Time Complexity

Time complexity is a measure of the amount of time required to solve a problem.



Space Complexity

Space complexity is a measure of the amount of space required to solve a problem.



Recursion

Recursion is a technique where a function calls itself to solve a problem.



Sorting

Sorting is a technique where a list of elements is arranged in a specific order.



Searching

Searching is a technique where a specific element is found in a list.



Hashing

Hashing is a technique where a large amount of data is converted into a smaller amount of data.



Encryption

Encryption is a technique where data is converted into a form that is unreadable to anyone who intercepts it.



Decryption

Decryption is a technique where encrypted data is converted back into its original form.



Compression

Compression is a technique where data is converted into a smaller amount of data.



Decompression

Decompression is a technique where compressed data is converted back into its original form.



Networking

Networking is a technique where multiple computers are connected to each other.



Security

Security is a technique where data is protected from unauthorized access.



Artificial Intelligence

Artificial Intelligence is a technique where a computer is made to perform tasks that require human intelligence.



Machine Learning

Machine Learning is a technique where a computer is made to learn from data.



Deep Learning

Deep Learning is a technique where a computer is made to learn from data using a deep neural network.



Reinforcement Learning

Reinforcement Learning is a technique where a computer is made to learn from data using a reinforcement learning algorithm.

