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# Algorithm

An algorithm is a finite sequence of well-defined, computer-implementable instructions, typically to solve a class of problems or to perform a computation.

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### What is Algorithm?

**An algorithm is a set of instructions or a procedure** that is followed to solve a problem or perform a specific task. It is a step-by-step procedure or formula that outlines how to perform a particular operation, often in a systematic and efficient way.

In computer science, algorithms are **used to solve complex problems and perform tasks** such as data processing, searching and sorting large datasets, and mathematical calculations. They are essential to the functioning of computers and other digital devices, as they provide a way to automate complex operations and perform tasks quickly and accurately.

Algorithms can be expressed in many different forms, such as pseudocode, flowcharts, or code in a programming language. They can also be analyzed and evaluated based on factors such as their time complexity, space complexity, and the efficiency of the underlying data structures and algorithms used.

Snippet from [Wikipedia: Algorithm](#)

In mathematics and computer science, an **algorithm** ( ) is a finite sequence of rigorous instructions, typically used to solve a class of specific problems or to perform a computation. Algorithms are used as specifications for performing calculations and data processing. More advanced algorithms can use conditionals to divert the code execution through various routes (referred to as automated decision-making) and deduce valid inferences (referred to as automated reasoning), achieving automation eventually. Using human characteristics as descriptors of machines in metaphorical ways was already practiced by Alan Turing with terms such as "memory", "search" and "stimulus".

In contrast, a heuristic is an approach to problem solving that may not be fully specified or may not guarantee correct or optimal results, especially in problem domains where there is no well-defined correct or optimal result. For example, social media recommender systems rely on heuristics in such a way that, although widely characterized as "algorithms" in 21st century popular media, cannot deliver correct results due to the nature of the problem.

As an effective method, an algorithm can be expressed within a finite amount of space and time and in a well-defined formal language for calculating a function. Starting from an initial

state and initial input (perhaps empty), the instructions describe a computation that, when executed, proceeds through a finite number of well-defined successive states, eventually producing "output" and terminating at a final ending state. The transition from one state to the next is not necessarily deterministic; some algorithms, known as randomized algorithms, incorporate random input.

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### GitHub Topics

- <https://github.com/topics/algorithm>

Algorithms are detailed sets of guidelines created for a computer program to complete tasks efficiently and thoroughly.

### External links:

- <https://simple.m.wikipedia.org/wiki/Algorithm>
- <https://techterms.com/definition/algorithm>
- <https://www.geeksforgeeks.org/fundamentals-of-algorithms/>

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