

## Algorithm

An algorithm is a step by step method of solving a problem. It is commonly used for data processing, calculation and other related computer and mathematical operations.

An algorithm is a detailed series of instructions for carrying out an operation or solving a problem. In a non-technical approach, we use algorithms in everyday tasks, such as a recipe to bake a cake. Technically, computers use algorithms to list the detailed instructions for carrying out an operation. For example, to compute an employee's paycheck, the computer uses an algorithm. To accomplish this task, appropriate data must be entered into the system. In terms of efficiency, various algorithms are able to accomplish operations or problem solving easily and quickly.

Algorithms are widely used throughout all areas of IT (information technology). A search engine algorithm, for example, takes search strings of keywords and operators as input, searches its associated database for relevant web pages, and returns results.

The word algorithm derives from the name of the mathematician, Mohammed ibn-Musa al-Khwarizmi, who was part of the royal court in Baghdad and who lived from about 780 to 850. Al-Khwarizmi's work is the likely source for the word algebra as well. Algorithm is not the computer code. Algorithms are just the instructions which give a clear idea to you to write the computer code.

To make a computer do anything, you have to write a computer program. To write a computer program, you have to tell the computer, step by step, exactly what you want it to do. The computer then "executes" the program, following each step mechanically, to accomplish the end goal. When you are telling the computer what to do, you also get to choose how it's going to do it.

For example: You have a friend arriving at the airport, and your friend needs to get from the airport to your house. Here are four different algorithms that you might give your friend for getting to your home:

### **The taxi algorithm:**

1. Go to the taxi stand.
2. Get in a taxi.
3. Give the driver my address.

### **The call-me algorithm:**

1. When your plane arrives, call my cell phone.
2. Meet me outside baggage claim.

### **The rent-a-car algorithm:**

1. Take the shuttle to the rental car place.

2. Rent a car.
3. Follow the directions to get to my house.

**The bus algorithm:**

1. Outside baggage claim, catch bus number 70.
2. Transfer to bus 14 on Main Street.
3. Get off on Elm street.
4. Walk two blocks north to my house.

All four of these algorithms accomplish exactly the same goal, but each algorithm does it in completely different way. Each algorithm also has a different cost and a different travel time. Taking a taxi, for example, is probably the fastest way, but also the most expensive. Taking the bus is definitely less expensive, but a whole lot slower. You choose the algorithm based on the circumstances.

In computer programming, there are often many different ways -- algorithms -- to accomplish any given task. Each algorithm has advantages and disadvantages in different situations.

**Qualities of a good algorithm**

1. Input and output should be defined precisely.
2. Each steps in algorithm should be clear.
3. Algorithm should be most effective among many different ways to solve a problem.
4. An algorithm shouldn't have computer code. Instead, the algorithm should be written in such a way that, it can be used in similar programming languages.