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Denis Stashuk¹, Olga Kalantaeva²

¹student of group CST-228 ZNTU

²teacher ZNTU

PROBLEM SOLVING METHODS (ALGORITHMS)

In mathematics and computer science, an algorithm is an unambiguous specification of how to solve a class of problems. Algorithms can perform calculation, data processing, and automated reasoning tasks.

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.

In computer systems, an algorithm is basically an instance of logic written in software by software developers, to be effective for the intended "target" computer(s) to produce *output* from given (perhaps null) *input*. An optimal algorithm, even running in old hardware, would produce faster results than a non-optimal (higher time complexity) algorithm for the same purpose, running in more efficient hardware; that is why algorithms, like computer hardware, are considered technology.