CLRS for Dummies

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1.22.2025

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Preface

This is a book for dummies who can understand Introduction to Algorithms by CLRS. Everything is taken directly from that book or paraphrased.

Chapter 1

The Role of Algorithms

1.1   Definitions

Algorithms

Algorithm is a procedure used to solve a computational problem.   An algorithm takes some value as **input** and produce some value as **output**.

Example: the **sorting problem**
    input : A sequence of n numbers $< a_1, a_2 \ldots a_n >$
    Output : The sequence ordered from lowest to highest $< a'_1, a'_2 \ldots a_n >$

Such sequence of inputs is called **instance** of the problem.
An algorithm is **correct** and **solve** the problem if for every input instance it ends with the correct output.
Sorting is the only computational problem we can solve with algorithms, every problem we see is some sort of sorting.

Data Structures

A **data structure** is a way to store and organize data that facilitate access and modification.

Complexity

When we talk about the complexity of an algorithm. There are two types.

    Time Complexity : How long the algorithm takes to produce the results.

    Space Complexity : How much storage space an algorithm needs.