Notes of the Introduction To Algorithms

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Part I

Foundations

Chapter 1

The Role of Algorithms in Computing

1.1 Algorithms

Exercies

1.1.1 Give a real-world example that requires sorting or a real-world example that requires computing a convex hull.

Answer: One example that requires sorting is that teachers will sort our scores after the exam.

1.1.2 Other than speed, what other measures of efficiency might one use in a real-world setting ?

Answer: cost, space, manpower, material resources. In different cases, each can be the key of meausres of efficiency.

Reference: Reference

1.1.3 Select a data structure that you have seen previously, and discuss its strengths and limitations.

Answer: Array

strengths: access directly

limitations: costs lot when insert or delete

1.1.4 How are the shortest-path and traveling-salesman problems given similar? How they are different?

1.1.5 Come up with a real-world problem in which only the best solution will do. Then come up with one in which a solution that is "approximately" the best is good enough.

1.2 Algorithms as a technology

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Getting Started

Chapter 3

Growth of Functions

Chapter 4

Divide-and-conquer

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Probabilistic Analysis and Randomized Algorithms

Part II

Sorting and Order Statistics

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Advanced Design and Analysis Techniques

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Selected Topics

Part VIII

Appendix: Mathematical Background