

# Algorithms

by

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## Textbook

T. Cormen, C. E. Leiserson, R. L. Rivest, and  
C. Stein, *Introduction to Algorithms*, third  
edition, the MIT press, 2009.

## Reference

R. C.-T. Lee, R. C. Chang, S.-S. Tseng, and  
Y.-T. Tsai, *Introduction to the Design and  
Analysis of Algorithms*, McGraw-Hill, 2005.

## Outline:

### I Foundations

1. The role of Algorithms in Computing
2. Getting Started
3. Growth of Functions
4. Divide-and-Conquer

### II Sorting and Order Statistics

6. Heapsort
7. Quicksort
8. Sorting in Linear Time
9. Medians and Order Statistics

### IV Advanced Design and Analysis Techniques

15. Dynamic Programming
16. Greedy Algorithms
17. Amortized Analysis

### V Advanced Data Structures

21. Data Structures for Disjoint Sets

**VI Graph Algorithms**

- 22. Elementary Graph Algorithms
- 23. Minimum Spanning Trees
- 24. Single-Source Shortest Paths
- 25. All-Pairs Shortest Paths
- 26. Maximum Flow

**VII Selected Topics**

- 31. Number-Theoretic Algorithms
- 33. Computational Geometry
- 34. NP-Completeness
- 35. Approximation Algorithms

**Self-educated:** Chapters 10~12, 18, 32.4

**Scoring:**

- .Homework                      20%
- .Midterm Examination   35%
- .Final Examination        45%

**Office Hour:** 2:00pm ~ 3:30pm (Mon.~Fri.)