

Summary

- **Analysis Techniques**

1. Asymptotic Analysis
(Θ , Ω , O , ω , and o notations, recurrences and summations)
2. Amortized Analysis
(aggregate, accounting, and potential)
3. Adversary Arguments
(better lower bounds)

- **Data Structure**

1. Heap
2. Hash table, List, Stack, Queue, Tree, and Graph

- **Basic Design**

1. Sorting
($\Theta(n \lg n)$ algorithms, $\Theta(n)$ algorithms, lower bound, sorting networks)

- **Advanced Design**

1. Dynamic Programming
2. Greedy Algorithms
3. Randomized Algorithms
4. Approximation Algorithms

- **Bonus Problems**

1. Marriage Problems
(stable marriage, seating problems, and mate-selection problems)
2. Special numbers:
 - (a) ϕ (Fibonacci number and golden-ratio)
 - (b) π (randomized algorithm)
 - (c) e (compound interest rate and harmonic series)

Other Topics (not covered)

- **Design**

1. Graph Algorithms
2. Combinatoric Algorithms
3. DNA Algorithms
4. Genetic Programming (Algorithms)
5. Others

- **Data Structures**

1. B-Trees
2. Binomial Heaps
3. Fibonacci Heaps
4. Others