

Data Structures and Algorithms

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Introduction

Data Structures and Algorithms

Undergraduate course



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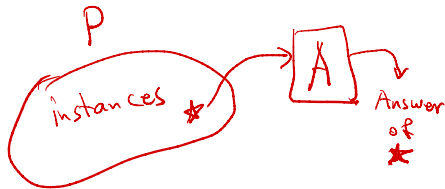
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Introduction to Data Structures and Algorithms

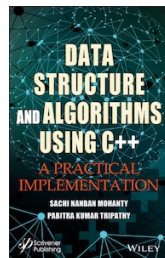
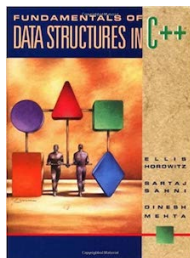
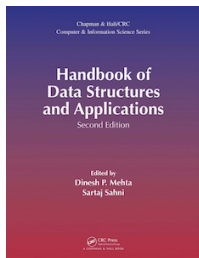
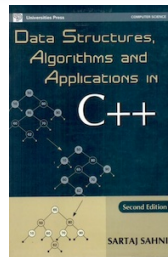
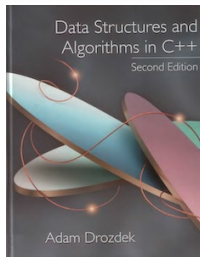
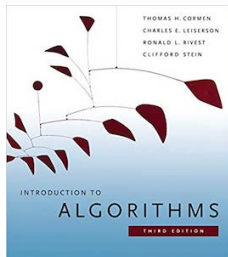
- What is a data structure? \Rightarrow A way for storing/organizing/processing/retrieving the data to suit a specific purpose.
- What is an algorithm?
- How about data structures and algorithms?
- Why they are important?

Algorithms
for
Data structures

An algorithm is a finite set of precise instructions to solve a problem.



Course References



Course Outlines

- Review on variables, arrays, and pointers
- Analysis of algorithms
- Amortized analysis
- Linear data structures
 - ▶ Linked list and its variations
 - ▶ Stack
 - ▶ Queue
- Sorting algorithms
- Hashing
- Non-linear data structures
 - ▶ Trees
 - ▶ Search trees
 - ▶ Balanced search trees (AVL-Tree, B-Tree, B⁺-Tree, Red-Black-Tree)
 - ▶ Tries
 - ▶ Disjoint sets
 - ▶ Graphs
- Priority Queue (Heaps, Deap)