

CE100 Algorithms and Programming II

Week-5 (Dynamic Programming)

Spring Semester, 2021-2022

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Quicksort Sort

Outline

- Convex Hull (Divide & Conquer)
- Dynamic Programming
 - Introduction
 - Divide-and-Conquer (DAC) vs Dynamic Programming (DP)

- Fibonacci Numbers
 - Recursive Solution
 - Bottom-Up Solution
- Optimization Problems
- Development of a DP Algorithms

- Matrix-Chain Multiplication
 - Matrix Multiplication and Row Columns Definitions
 - Cost of Multiplication Operations (pxqxr)
 - Counting the Number of Parenthesizations

- The Structure of Optimal Parenthesization
 - Characterize the structure of an optimal solution
 - A Recursive Solution
 - Direct Recursion Inefficiency.
 - Computing the optimal Cost of Matrix-Chain Multiplication
 - Bottom-up Computation

- Algorithm for Computing the Optimal Costs
 - MATRIX-CHAIN-ORDER
- Construction and Optimal Solution
 - MATRIX-CHAIN-MULTIPLY
- Summary

References

TODO