

# Dynamic Programming

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# Outline

## 1 Main Ideas

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## Approach

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- 1 **Characterize** the structure of an optimal solution.

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- 2 **Recursively** define the value of an optimal solution.

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- 4 **Compute** an optimal solution from the computed information.

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- 3 **Compute** the *value* of an optimal solution in bottom-up fashion.
- 4 **Compute** an optimal solution from the computed information.

## Optimal Substructure Property

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Statement

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The optimal solution to a problem is composed of optimal solutions to sub-problems.

## List of Problems

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- 1 Binomial Coefficient.

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- 7 Binary Search Trees.

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- 5 Longest common subsequence.
- 6 All-pairs shortest paths.
- 7 Binary Search Trees.
- 8 0/1 Knapsack.