Algorithm Design and Analysis

University Computer Science · Vocabulary in context

Word	Example
algorithm design and analysis	**Algorithm design and analysis** compares solutions and how fast they are.
recurrence /rɪˈkʌrəns/	The **recurrence** $T(n) = 2T(n/2) + n$ describes merge sort. $$T(n) = 2T(n/2) + n$$
recursion tree	A **recursion tree** shows the work done at each level.
merge sort /mɜːdʒ sɔːt/	**Merge sort** splits the list in half, sorts each half and joins them.
quicksort	**Quicksort** splits the list around a pivot.
greedy algorithm	A **greedy algorithm** takes the best choice at each step.
exchange argument	An **exchange argument** shows that swapping in the greedy choice never makes things worse.
dynamic programming	**Dynamic programming** solves each small problem once and saves the answer.
DP table	A **DP table** stores the answers to the small problems.
dependency order	Fill the table in **dependency order**, so each answer you need is ready.
Kruskal	**Kruskal**'s algorithm adds the cheapest edges that do not make a loop.
cuts	A graph can have many **cuts**: each one splits the nodes into two groups.

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↓ **reduction** /rɪˈdʌkʃn/	A **reduction** turns one problem into another.
NP-completeness	To prove **NP-completeness**, show the problem is in NP and is NP-hard. NP NP-hard

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