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Greedy Algorithms –

Advantages

Pitfalls

Real-World Scenarios

Vs Other Algorithms

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Greedy algorithms are algorithms that search for a solution to problems in the shortest possible time by picking the path that is the most optimal at the moment. Some advantages of greedy algorithms include that they are simplistic, efficient, and memory efficient. The simplicity includes greedy algorithms being easy to understand and implement, design, and analyze. The efficiency of greedy algorithms leads to low time complexity, even for large inputs. The advantage of memory efficiency includes involving less memory usage by only needing to store the current best solution and not previous solutions or the entire problem space. The pitfalls of greedy algorithms are that they lack global optimization, lack the ability to backtrack, and are dependent on problem structure. The lack of global optimization leads to locally optimal choices instead of considering the overall solution and may not have the best global optimal solution. The lack of backtracking can lead to suboptimal or incorrect results if better options become available than the previous ones the greedy algorithm chose. Greedy algorithms are also dependent on problem structure, which means the same greedy algorithm may not work well for all problem instances. Real-world scenarios of greedy algorithms include Kruskal’s algorithm for minimum spanning tree and Dijkstra’s algorithm for shortest path. The greedy algorithm is different from other algorithms because it is focused on selecting the best current option, while other algorithms check all possible options.

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