Greedy Recap

Lecture Flow

- Pre-requisites
- Greedy
- Bootcamp

Prerequisites

- Arrays
- Heap

Greedy

The greedy method is an approach to solving problems by making locally optimal choices at each stage with the hope of finding a global optimum.

It follows the idea that, at each step, the approach selects the best available option without considering the consequences of that choice in future steps.

Properties of Greedy

1. Greedy Choice Property: A greedy algorithm makes the locally optimal choice at each step without considering the overall structure of the problem.

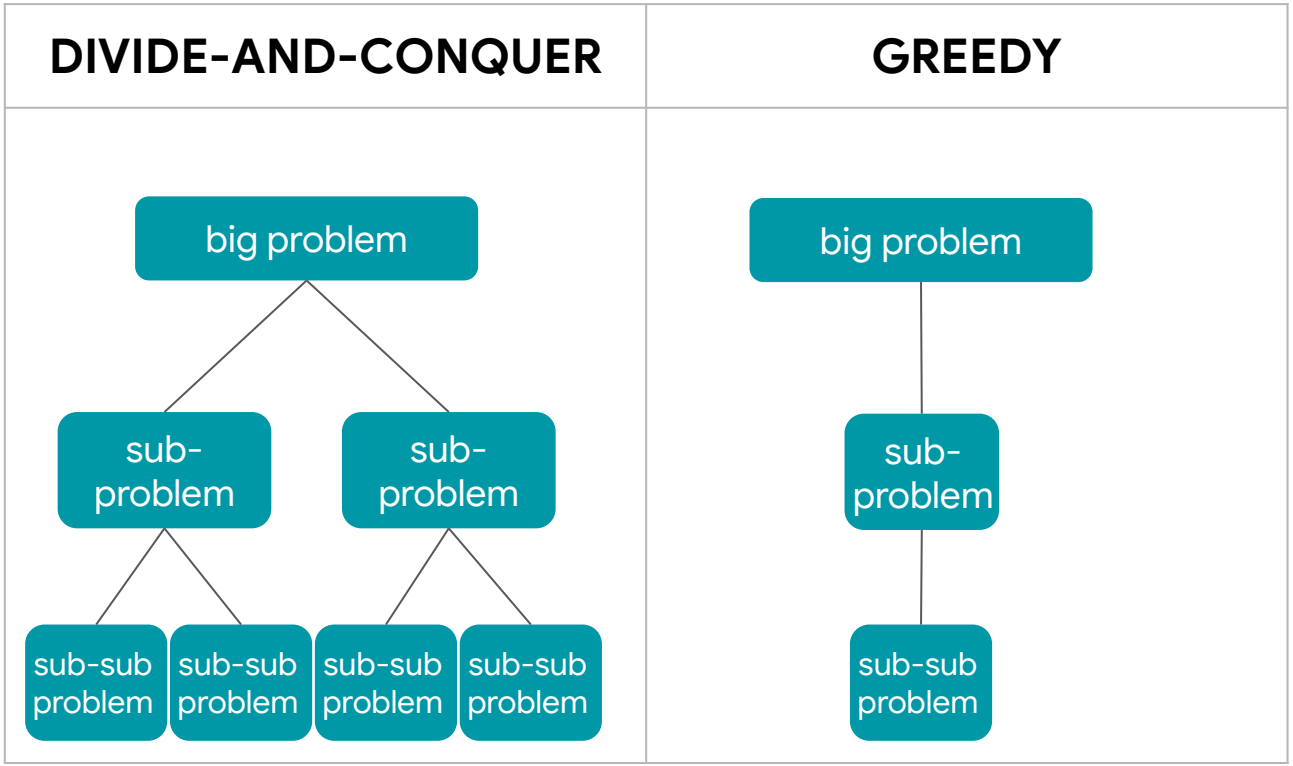
2. Optimal Substructure: The problem should have the property that an optimal solution to the entire problem can be constructed from optimal solutions to its subproblems.

Greedy vs Divide-and-Conquer

Greedy algorithms make locally optimal choices at each step with the hope that they lead to a globally optimal solution.

Divide and conquer algorithms break down a problem into smaller subproblems, solve them independently, and combine their solutions to obtain the final result.

Greedy vs Divide-and-Conquer



Proving Correctness

Proofing or analyzing the correctness and optimality of greedy algorithms involves demonstrating that the algorithm consistently makes locally optimal choices at each step, leading to a globally optimal solution.

Proof by Induction

The technique involves proving a statement for a base case and then demonstrating that if the statement holds for any given case, it must also hold for the next case.

Greedy Bootcamp (To be done in lecture with instructor)

1 Longest Chunked Palindrome Decomposition

2 IPO

3 Maximum Performance of a Team

Practice Problems

Lemonade Change

Minimum Number of Arrows to Burst Balloons

Rabbits in Forest

Minimum Moves to Reach Target Score

Quote of the Day

"A problem well stated is a problem half solved."

— John Dewey