1. Describe Greedy algorithm with example?

A **greedy algorithm** is an approach for solving optimization problems by making a sequence of choices, each of which looks the best at the moment (locally optimal), in the hope that this strategy leads to a globally optimal solution. It doesn't revisit decisions or backtrack, which makes it efficient, but it doesn't always guarantee an optimal solution for all problems.

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Examples:

**1. Coin Change Problem**

**Problem:**

Given a set of coin denominations (like 1, 5, 10, 25), you need to make a specific amount of change using the fewest number of coins.

**Greedy Approach:**

At each step, take the largest denomination coin that does not exceed the remaining amount.

**Example:**

If the denominations are {1, 5, 10, 25} and you need to make 37:

1. Take one 25-coin → 37 - 25 = 12
2. Take one 10-coin → 12 - 10 = 2
3. Take two 1-coins → 2 - 1 - 1 = 0

Coins used: 1 × 25, 1 × 10, 2 × 1 = **4 coins**.

However, this works only for certain denominations. For example, if you have denominations {1, 3, 4} and need to make 6, the greedy algorithm will select 4 and 1+1, but the optimal solution would be 3+3.