**Introduction to Greedy Technique**

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Greedy technology is a technique that solves a problem with **a series of choices**. Each choice in the technique must

1. satisfy the constraints of the problem.
2. choose the best choice among all possible choices at that stage. The term "greedy" comes from here.
3. is not cancellable. In other words, once a selection is made, you can not change the selection later.

For example, suppose you are a cashier in a store and you need to return **48 cents** to the customer with a minimum number of coins. There are four types of coins in the store: quarter, dime, nickel, and penny. How many coins will you return to your customer and what is your approach?

For the problem, I believe that you will return a total of 6 coins in 1 quarter, 2 dimes, and 3 pennies.

Let's think about how you approached the problem.

First, you tried to return as many quarters as possible.

After that, you considered dimes. And then, nickel and penny.

Actually, this is a greedy approach (= 25 cent → 10 cent → 5 cent → 1 cent).

You have made several choices from the coin of great value to the coin of small value. At each choice you tried to get the most out of it.

For the sample problem, 6 coins are the best solution. And the US coin system (= 25 cent, 10 cent, 5 cent, 1 cent) always provides the least amount of coins for all changes. However, this greedy technology does not always provide the optimal solution for every coin system.

Suppose we have a country with a coin of “7 cent”, “5 cent”, and “1 cent”. If a cashier in this country had to return 11 cents, how many coins would the cashier return based on the greedy technique we discussed?

The cashier will return 5 coins with one “7 cent” coin and four “ 1 cent” coins for 11 cents. However, this is not the optimal solution. The cashier can return 3 coins with two "5 cent" coins and one "1 cent" coin.

This is a summary of greedy technique.

You need to make a series of choices to solve a problem using greedy technique. Each selection must be

1. feasible (= satisfy the problem’s constraints)
2. locally optimal (= choose the best choice among all possible choices available at that stage)
3. irrevocable (= once made, the choice can’t be changed later)

Greedy technique does not always provide the optimal solution. For some problems, it yields the optimal solution. But not for some other problems.