

# Greedy algorithms

## Greedy strategy

- make some greedy choice
- reduce to a smaller problem
- iterate

## Definition

Sub-problem is a similar problem of smaller size.

## Definition

A greedy choice is called safe choice if there is an optimal solution consistent with this first choice.

## Recap:

Reduction to Sub-problem

- Make some first choice
  - Then solve a problem of the same kind
  - Smaller: fewer digits, fewer patients.
  - This is called a 'sub problem'
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- Safe choice is critical!
  - Not all first choices are safe
  - Greedy choice are often unsafe

## **General strategy**

Problem → Greedy choice - > safe choice → sub problem → problem

- Make greedy choice
- Prove that it is a safe choice
- Reduce to a sub problem
- Solve the sub problem