501 - Divide & Conquer

divide and conquer is an algorithm design paradigm.

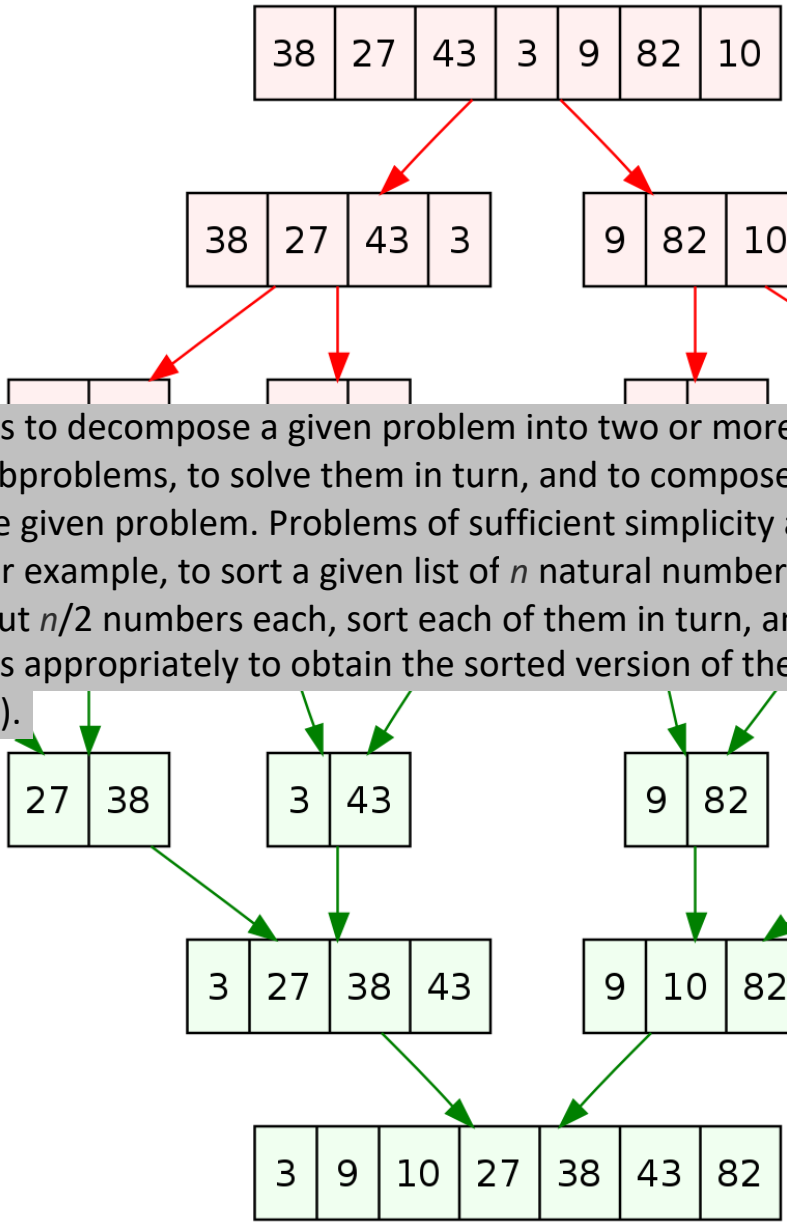
Simply

- Divide a larger problem into smaller problems
- Keep splitting it until you get to a problem that is simple enough to solve

However

- You have to find the right places to split the problem up

A divide-and-conquer algorithm recursively breaks down a problem into two or more sub-problems of the same or related type, until these become simple enough to be solved directly. The solutions to the sub-problems are then combined to give a solution to the original problem.



Basic idea is to decompose a given problem into two or more similar, but simpler, subproblems, to solve them in turn, and to compose their solutions to solve the given problem. Problems of sufficient simplicity are solved directly. For example, to sort a given list of *n* natural numbers, split it into two lists of about *n*/2 numbers each, sort each of them in turn, and interleave both results appropriately to obtain the sorted version of the given list (see the picture).