# Dynamic programming

Dynamic program works like divide and conquer, but are used, when subproblems share subproblems. It will use memory to check if a subproblem has been solved before and will therefor speed up the process. An example is showed in the *Rod cutting algorithm.*

It is typically used for optimization algorithms where each solution has a value (ex. Cost) and we want to find a Min or Max Value.

When developing a dynamic-programming algorithm we follow a sequence of four steps:

1. Characterise the structure of an optimal solution.
2. Recursively define the value of an optimal solution.
3. Compute the value of an optimal solution, typically in a bottom-up fashion.
4. Construct an optimal solution from computed information.

When the solutions to subproblems are stored the way of getting them need to be stored too. Again, it is all shown in the *Rod cutting algorithm.*