2017-09-18

- **Principle of optimality**: Any subpolicy of an optimum policy must itself be an optimum policy with regard to the initial and terminal states of the subpolicy (Bellman 1957).
- **Dynamic programming**: forward v.s. backward approach.
- If the principle of optimality does not hold, then dynamic programming may fail.
- Algorithms for variants of *shortest path problem*:
  - *Dijkstra's algorithm*: undirected/directed graph w/o negative edges.
  - *Bellman-Ford algorithm*: directed graph w/o negative cycles.
  - *Dynamic programming*: directed acyclic graph.
- **Optimal parenthesization problem**: Given a string of n items, find an optimal parenthesization of the string. Can be applied to file merging and Huffman code grouping.