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## 17. Optimality Principle

- A Bellman equation, named after Richard E Bellman, is a necessary condition associated with the mathematical optimization method known as dynamic programming.
  - It writes the "value" of a decision problem at a certain point in time in terms of the payoff from <sup>some</sup> initial choices & the "value" of the remaining decision problems that result from those choices.
  - The dynamic programming method breaks decision problems into subproblems.
- Principle of Optimality: An optimal policy has the property that whatever the initial state & initial decision are, the remaining decisions must constitute an optimal policy with regard to the state resulting from the first decision.