- **Multiple Decision Making – Chapter 18 Summary**
- **Goal**: Make a **sequence of decisions** under uncertainty to maximize long-term utility.
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- **1. Key Concepts**
  - **Sequential Decisions**: Each choice affects future options and outcomes.
  - **Utility**: Measures desirability of outcomes; aim is to **maximize expected utility**.
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- **2. Decision Networks (Influence Diagrams)**
  - Extend Bayesian networks by adding:
  - **Chance nodes** (uncertain variables)
  - **Decision nodes** (agent choices)
  - **Utility nodes** (agent preferences)
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- **3. Optimal Policies**
  - A policy is a **mapping from states to actions**.
  - Use **backward induction** or **dynamic programming** to compute optimal policies.
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- **4. Value of Information (VoI)**
  - Measures **how much gaining new information** improves decisions.
  - VoI ≥ 0 always; helps decide **whether to observe before acting**.
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- **5. Applications**
  - Medical diagnosis
  - Robotics
  - Game AI
  - Investment planning