Agent is an entity that perceives and acts

Rational agents act to achieve an optimal outcome

Reflect agents consider how the world is:

* Simplest form of agent
* Choose action based on current percept (and maybe memory)
* May have memory or model of world’s current state
* Do not consider future consequences of actions
* May be rational, may not be

Planning agent:

* Consider how the world would be
* Decisions based on hypothesized consequences of actions
* Must have a model of how the world evolves in response to actions
* Must formulate a goal (test)

Discrete search problem

* Given…:
  + Finite state space
  + Finite action space
  + Transition model (state resulting from given action from given state)
  + Start state, goal state
* We week to find a solution plan
  + Sequence of actions that lead from start to goal
  + Optimal plan has least “cost” (eg steps)
* World state includes every detail of environment
* Search state keeps only details needed for planning (abstraction)

State space graphs

* Forms a directed graph in which nodes are states and links are actions
* Each state occurs only once
* Can rarely store full graph in memory

Search tree

* What if tree of plans and their outcomes starting from state state
* Root is start state
* Branches are actions
* Tree nodes show states, correspond to local PLANS
* For most problems, can never actually buildit
* Incrementally expand tree until goal state is reached