Search Quick Note
Definitions

• State
  • Some data structure that captures a configuration of the agent’s environment. (The information captured abstracts from irrelevant details).
  • There can be many different configurations.

• Knowledge State
  • Simply a special type of state!
  • Like every other state it captures a configuration of the agent’s environment.
  • The agent is part of the environment.
  • Knowledge states capture different configurations of the agent’s knowledge about its environment.
  • In different configurations the agent knows different things.
  • Like configurations of the environment, the agent’s knowledge can have many different configurations.
Definitions

• **State Space**
  • Two main components
    • The set of all states (each one representing a particular configuration of the agent’s environment).
    • The set of actions—which determine the transitions between states.
  • Other minor components, e.g., the initial state and goal.
Definitions

• Search
  • The search algorithms operate on **paths** in the **state space**. A **node** in the search algorithms is a sequence of **states** $<s_0, s_1, ..., s_n>$ **where** each state is reached from the previous state by a **single action**.
Definitions

• **Search Space vs the State Space**
  • The state space consists of individual states and the transitions between them
  • The search space consists of paths (i.e., not individual states!)
    • These paths are often called nodes in the search space.
  • The search algorithms operate over the search space.

• Every path (node) $n$ starts at the initial state, travels through some states and terminates at an end_state$(n)$