Deterministic Planning

Given:

- A description of the effects and preconditions of the actions
- A description of the initial state
- A goal to achieve

find a sequence of actions that is possible and will result in a state satisfying the goal.

Forward Planning

Idea: search in the state-space graph.

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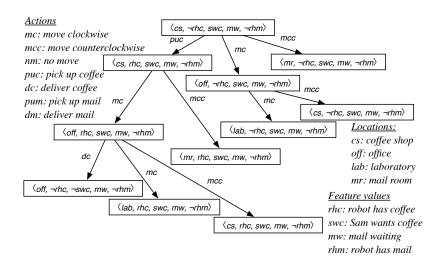
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- There is an arc $\langle s, s' \rangle$ labeled with action A if
 - A is an action that can be carried out in state s and
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 - A is an action that can be carried out in state s and
 - ightharpoonup s' is the state resulting from doing A in state s
- A plan is a path from the state representing the initial state to a state that satisfies the goal.

Example state-space graph



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- If you want a cycle check or multiple path-pruning, you need to be able to find repeated states.
- There are a number of ways to represent states:
 - ► As a map from features into their values
 - As a path from the start state

Forward search can use domain-specific knowledge specified as:

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 - don't go to the coffee shop unless "Sam wants coffee" is part of the goal and Rob doesn't have coffee (maybe not)

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