Reactive agents

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World representation

State representation

Recall that the agent here refers to a single vehicle. We chose to represent the state of an agent as the following:

- Current city: The city in which the agent is currently located.

- Destination city: At any time the agent is a state where it could pick up a task to bring to a city. This variable is this potential city. If there is no task to be pick up, this variable is set to $NULL$.

- Possible moves: A list of cities which the agent can travel to from current state i.e. its neighbor cities and its potential destination city.

Actions

In our state representation, an action is just a move to another city.

Reward

The reward for moving from a state to another city c is defined as:

$$R(s,c) = \mathbb{1}_{\{c\ =\ s.destinationCity\}} \cdot AR(s.currentCity, c) - Km(s.currentCity, c) \cdot CostPerKm$$

Probability of transition

The probability of transition to the state s' from the state s by moving to city c is defined as:

$$T(s,c,s') = \begin{cases} P(c, s'.destinationCity) \text{ if } destinationCity \text{ is not } NULL \\ 1 - \sum_{c' \in Cities} P(c, c') \text{ otherwise} \end{cases}$$

Implementation details

Observations