Content

1. Problem Solving Agents
2. Uniformed Search Methods
   • Tree Search
Recap

An agent *perceives* its environment through *sensors* and *acts* upon it through *actuators*.
Recap

Agent

Environment

Percepts

Actions
Goal Based Agent

- Environment
  - Sensors
    - Percept
    - update
    - possible actions
  - Planner
    - Goal
    - Actuators
    - Action
Problem Solving Agents
Problem Solving Agents
Search Problems

A search problem consists of:

• A state space

• A successor function (with actions, costs)

• A start state and a goal test

A solution is a sequence of actions (a plan) which transforms the start state to a goal state
Problem Formulation – Uber Agent

STATE SPACE: Known locations

ACTIONS: Known routes between locations

COST: Average time of route

INITIAL STATE: Pickup request location

GOAL TEST: Destination of customer
Problem-Solving-Agent:

Formulate **goal** using **state + precept**
Formulate **problem** using **state + goal**
**Find** sequence of actions to achieve goal
**Execute** action sequence
Repeat
Uber Agent

**Formulate goal using state + precept**
Location of Car + Pickup requests from Users
Choose Customer and Pickup Location

**Formulate problem using state + goal**
Take Pickup location and formulate plan to achieve goal
Problem-Solving-Agent:

- Formulate goal using state + precept
- Formulate problem using state + goal
- Find sequence of actions to achieve goal
- Execute action sequence
- Repeat
Formulating a Search Problem

Initial State: $s \in S$

Actions: $A$

Cost: $Cost(s, a, s') \rightarrow R$

Applicable actions:

$$Actions(s) = \{a_1, a_2, ..., a_i\}$$

Function that returns result of action:

$$Result(s, a) = s$$

Goal Test: Check for completion
Review: Language of Graphs

Node

Parent

Child

Edge

Path

1

2

3

4

5

6
Tree Search

Initial State:

Goal State:
Tree Search