Solving problems by searching

Chapter 3
Outline

Problem-solving agents
Basic search algorithms
Example problems
Problem formulation
Problem types
Example: Romania

- On holiday in Romania; currently in Arad.
- Flight leaves tomorrow from Bucharest.

Formulate goal:
- be in Bucharest.

Formulate problem:
- states: various cities
- actions: drive between cities
- sequence of cities: e.g., Arad, Sibiu, Fagaras, Bucharest

Find solution:
- actions: drive between cities
- states: various cities
Example: Romania
Problem-solving agent

Restricted form of general agent; solution executed “eyes closed“:

```plaintext
function SIMPLE-PROBLEM-SOLVING-AGENT(\text{percept}) \text{return} \text{an action}

\text{static:} \ seq, \text{ an action sequence }

\text{state, some description of the current world state}

\text{goal, a goal}

\text{problem, a problem formulation}

state \leftarrow \text{UPDATE-STATE(state, percept)}

\text{if seq is empty then}

\text{goal} \leftarrow \text{FORMULATE-GOAL(state)}

\text{problem} \leftarrow \text{FORMULATE-PROBLEM(state,goal)}

\text{seq} \leftarrow \text{SEARCH(problem)}

\text{action} \leftarrow \text{FIRST(seq)}

\text{seq} \leftarrow \text{REST(seq)}

\text{return action}
```