Problem-solving agents :

Chapter 3 Summary:

Reach goals through sequences of actions , Formulate the goals and the problem

* Abstraction: should be easier than the original problem

Problem types :

Single-state problem – Deterministic , Fully Observable   
Conformant problem – non-observable  
Contingency problem – nondeterministic and/or partially observable  
Exploration problem – unknown state space

Problem formulation :  
Given a stat and a set of actions, the successor function gives the possible next states

Initial state + successor function yields the state space

The state space = the set of all states reachable from the initial state  
The goal test determines if a state is a goal state

A path is a particular sequence off states connected by particular actions the path cost function assigns a cost to each path .

Basic search algorithms :  
Tip\* Graph search can be exponentially more efficient than tree search

Uninformed (“blind”) search algorithms can only generate successor nodes and do the goal test

Uninformed search algorithms : Breadth-first search, Uniform-cost search, Depth-first search, Depth-limited search, iterative deepening depth-first search, bidirectional search

Search algorithm performance measured along four dimensions:

* Completeness (will the algorithm always return a solution, if one exists)
* Optimality (will it always return the optimal solution, if one exists)
* Time complexity (how long does it take)
* Space complexity (how much memory does it take)

1. Branching factor , depth of the shallowest goal node & maximum length of any path in the state space
2. Search cost vs total cost (tradeoffs)

Informed search algorithms :

* Best-first search
* A\* search
* Heuristics - Good heuristics can dramatically reduce search cost

Relaxed problems : the optimal solution cost of a relaxed problem  
is no greater than the optimal solution cost of the real problem

















