<u>Searching</u>

Getting from one place to another:
       Not necessarily physically, "state" rather than "place".
       Search for a path
              Is the "map" known? Or can it be generated piece-wise?
              no: random attempts?
                     or methodical approach, backtracking?
              yes: known algorithm (no AI) but is it viable?
                     or know how to search

Fully observable, deterministic, known environment:
- Solution is a fixed sequence of steps
- Can ignore percepts once solution has been calculated - open loop
- Otherwise pay attention - closed loop

All search problems have:
- State space - a graph
- Initial state
- Goal state(s)
- Possible actions
- Transition model : state × action → state
- Action cost function - part of performance measure

Definitions
- Path = sequence of actions
- Solution = path from initial state to a goal state
- Optimal solution has least possible value of cost function
- The State Space is a graph
- Model: a level of abstraction, ignore certain facts
          e.g. driving: scenery, radio station, engine noise, etc.

More examples:
- 8 or 15 puzzle - finite state space
- Start at 4; √, floor, or !; end at any natural number
- Touring, e.g. Travelling Salesman Problem
- VLSI layout
- Protein design to cure a disease

Backtracking
- The farmer, the fox, the chicken, and the corn.
- Sudoku puzzles
- Eight Queens again