



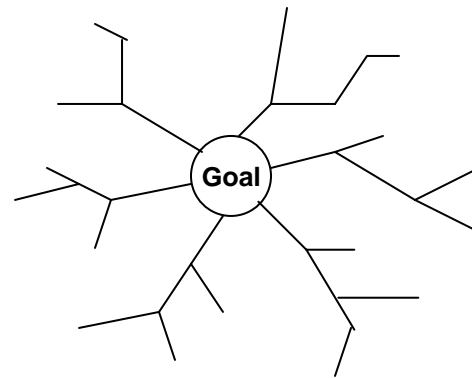
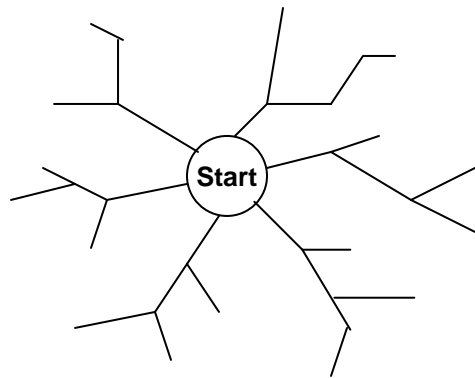
# Solving problems by searching

---

Chapter 3 addendum  
(Bidirectional search)

# Bidirectional Search

- Simultaneously search both forward (from the initial state) and backward (from the goal state)
- Stop when the two searches meet.
- Intuition =  $2 * O(b^{d/2})$  is smaller than  $O(b^d)$





# Bidirectional Search Discussion

---

- Numerical Example ( $b=10, l = 5$ )
  - Bi-directional search finds solution at  $d=3$  for both forward and backward search. Assuming BFS in each half 2222 nodes are expanded.
- Implementation issues:
  - Operators are reversible, e.g.,  $\text{Pred}(\text{Succ}(n)) = \text{Pred}(\text{Succ}(n))$
  - There may be many possible goal states.
    - Construct a goal state containing the superset of all goal states.
  - Check if a node appears in the “other” search tree.
  - Using different search strategies for each half.