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 = $2 \times O(b^{d/2})$ 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.