

Modularization & Extensibility & Reuse

- State Exploration: Water Pouring Problem



based on Peter Norvig's lecture Design of computer programs

- Framework development



dreamstime.com





dreamstime.com



**Goal: measure
'exactly' 6L**





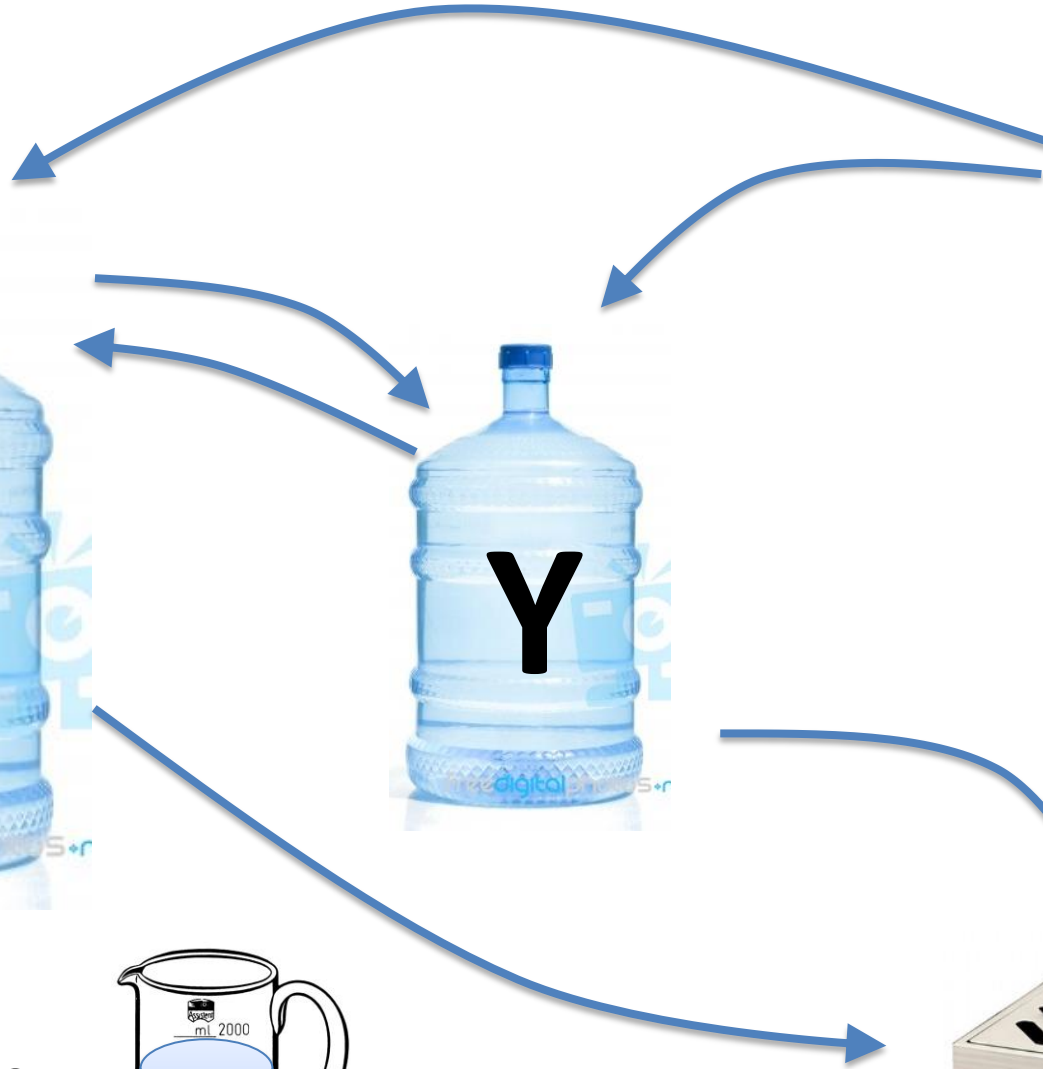
dreamstime.com



**Goal: measure
'exactly' 6L**



Generalization (1)

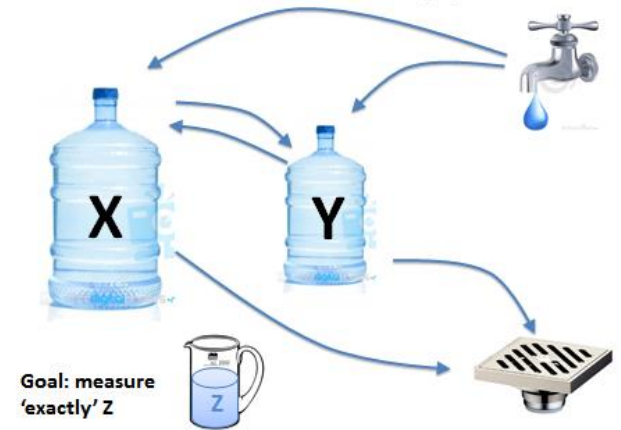


Goal: measure
'exactly' Z

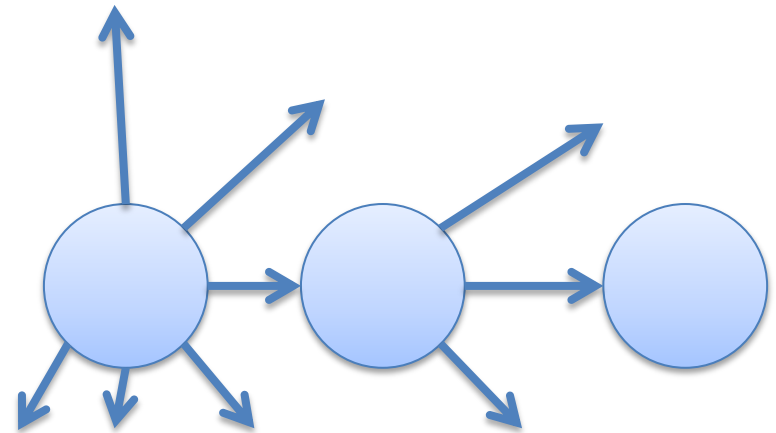


Inventory

- Canister
 - Capacity (X, Y)
 - Current (x, y)
 - Collection of canisters
- Source, Sink ?
- Goal (Z)
- 6 Pouring Actions
 - Empty
 - Fill
 - Transfer (e.g., $X \rightarrow Y$)
 - until Y is full
 - until X is empty
- Solution
 - Is 😊/😞 enough?
 - Sequence of actions/states



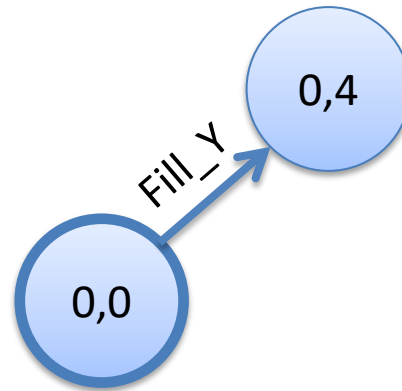
Global state:
 X, x, Y, y, Z



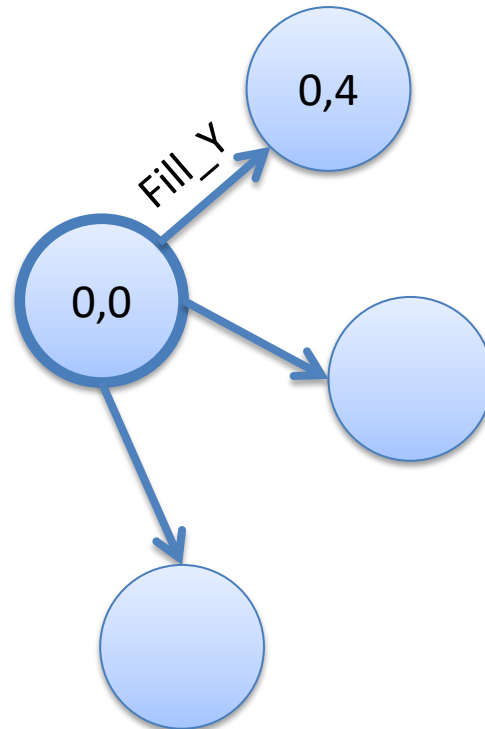
Exploration (Search)



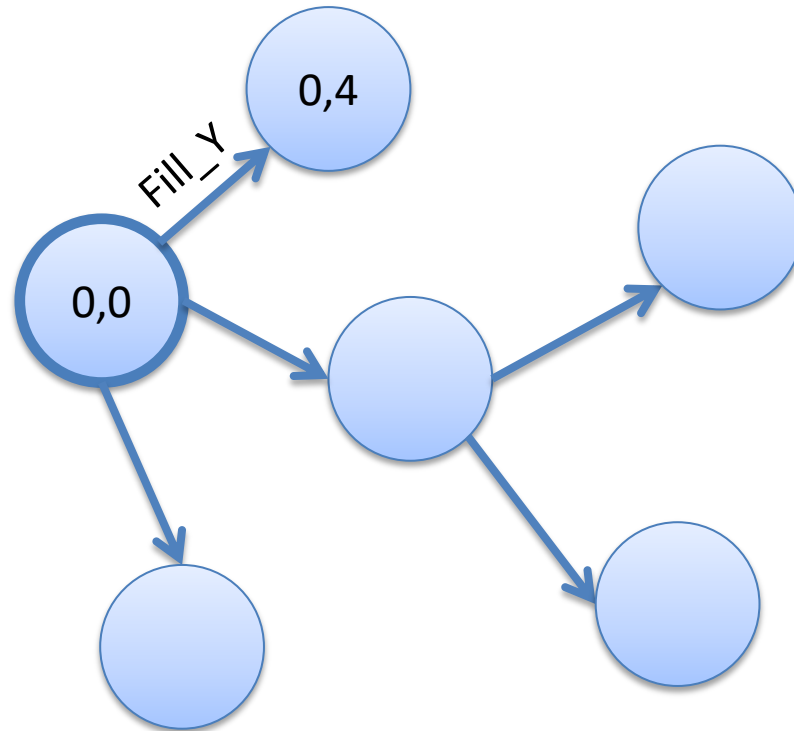
Exploration (Search)



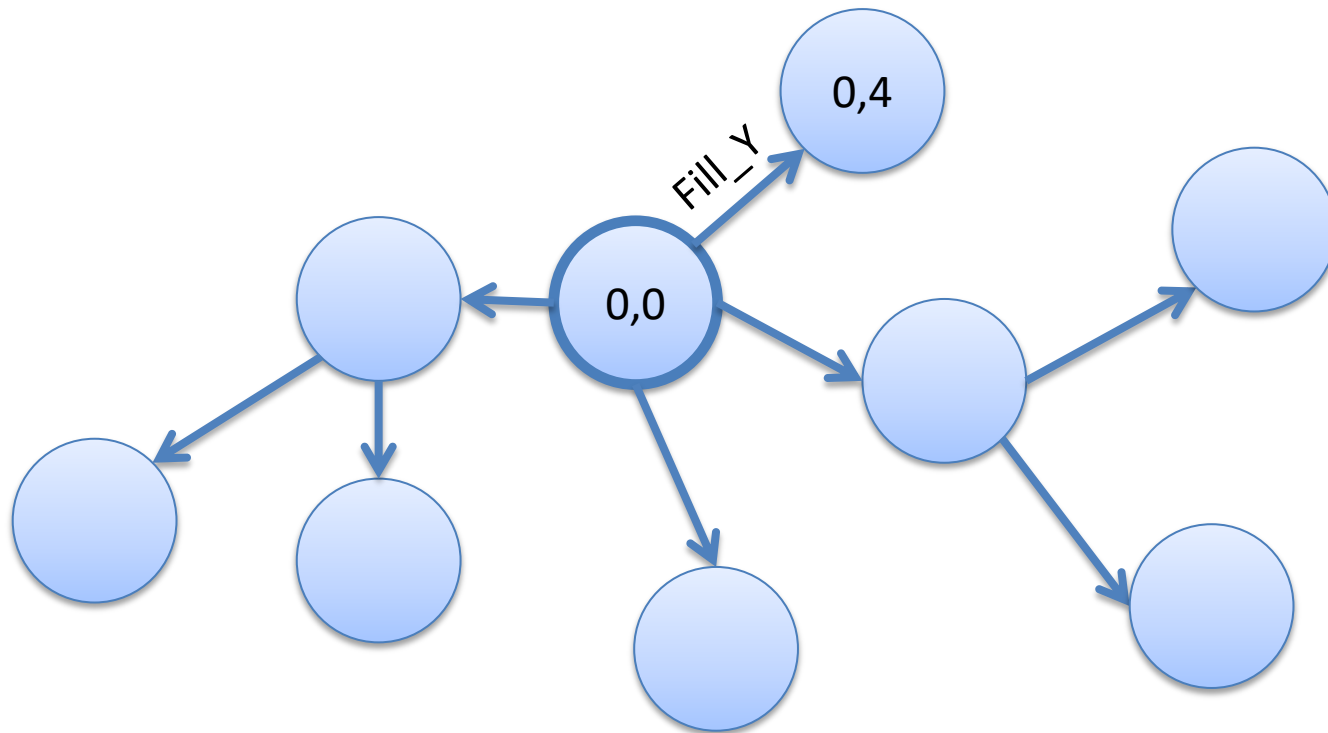
Exploration (Search)



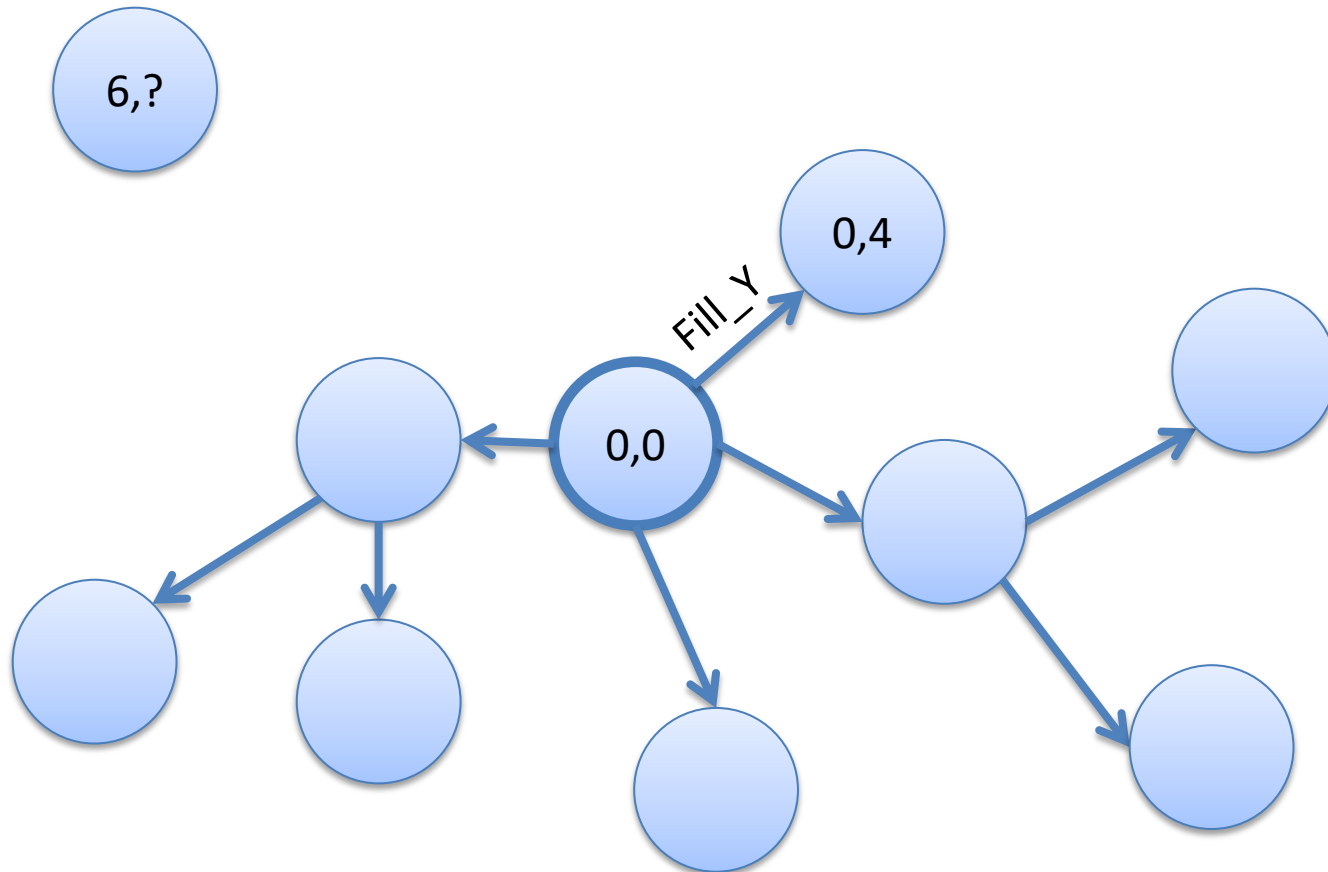
Exploration (Search)



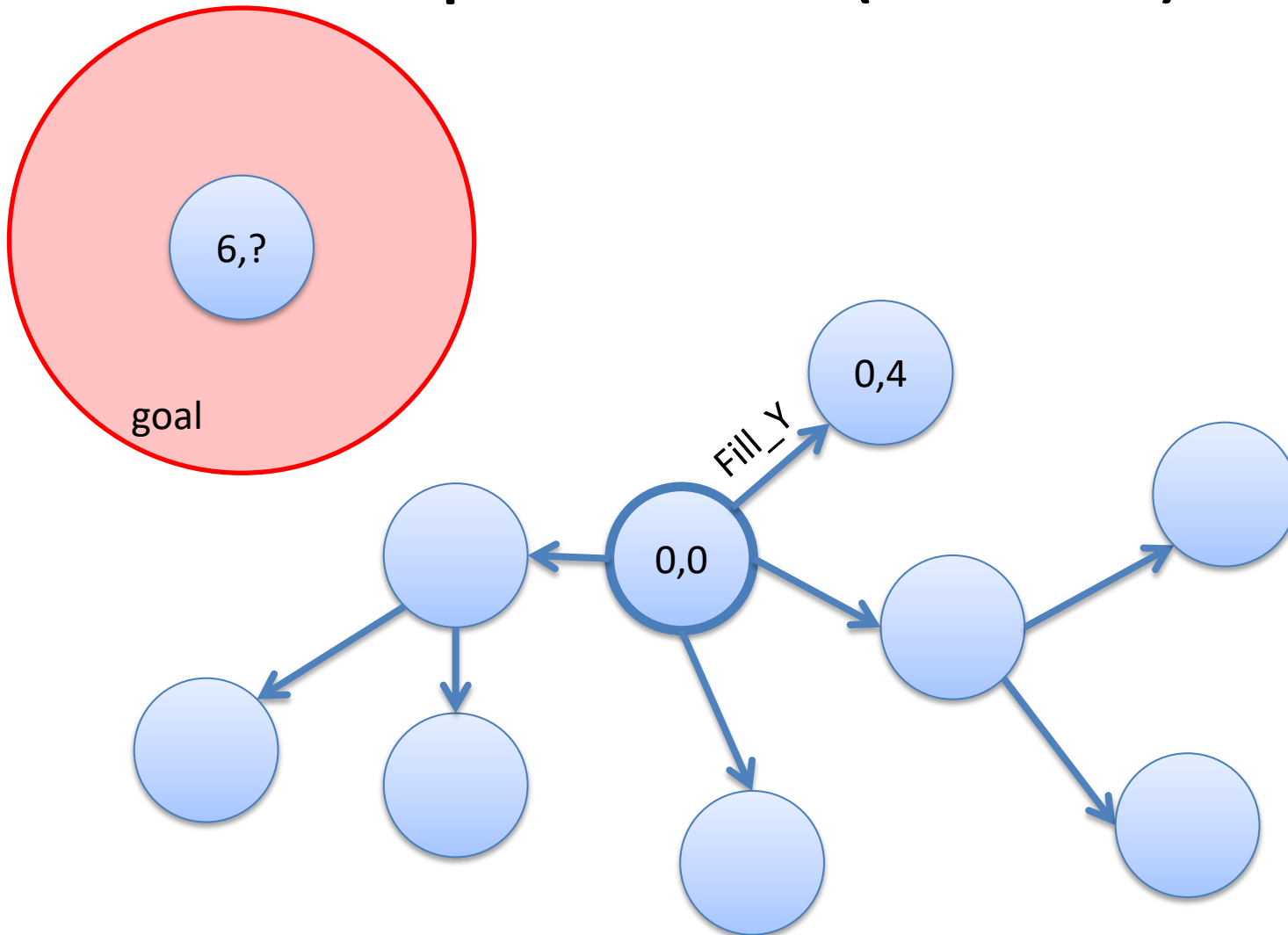
Exploration (Search)



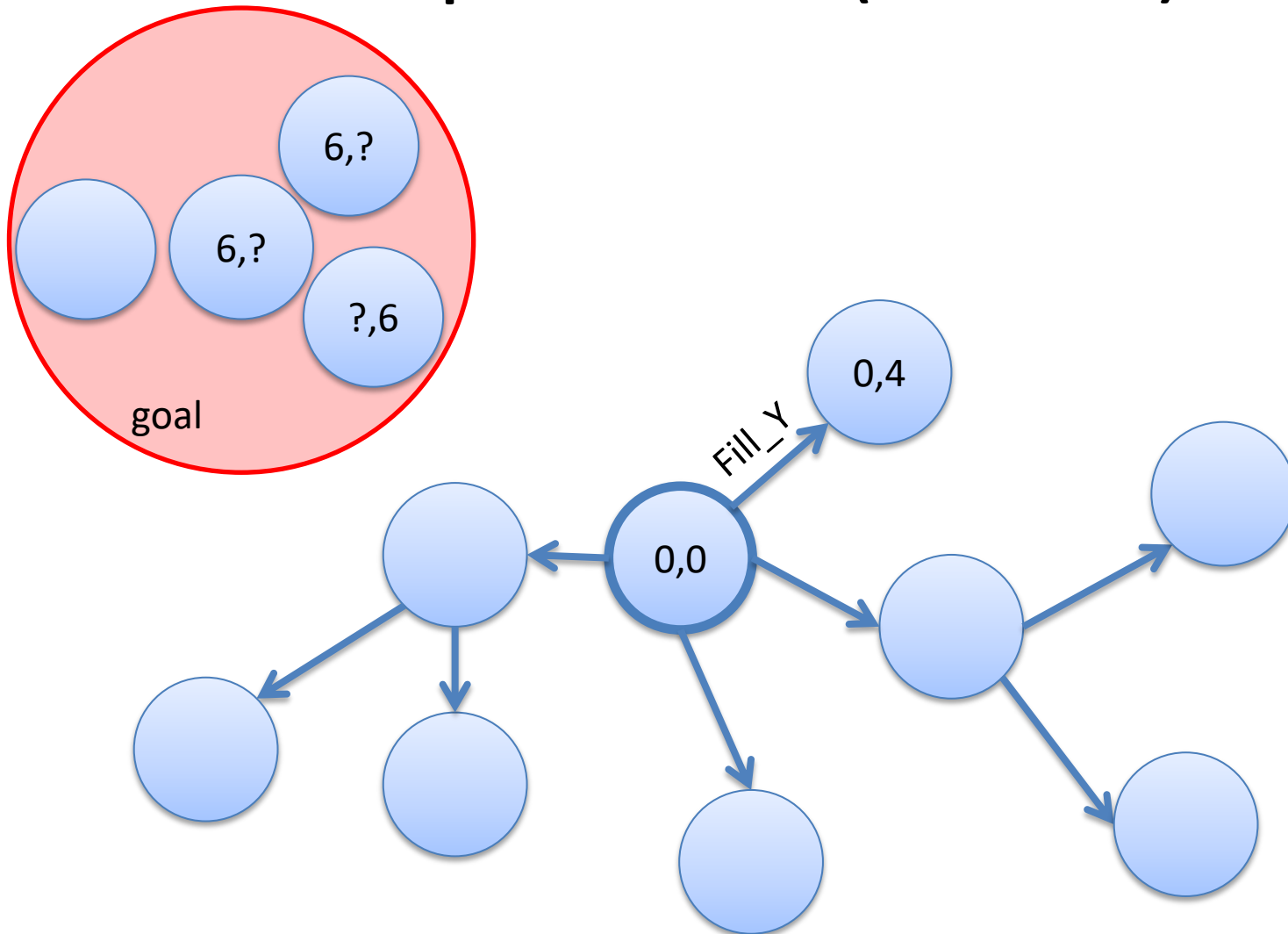
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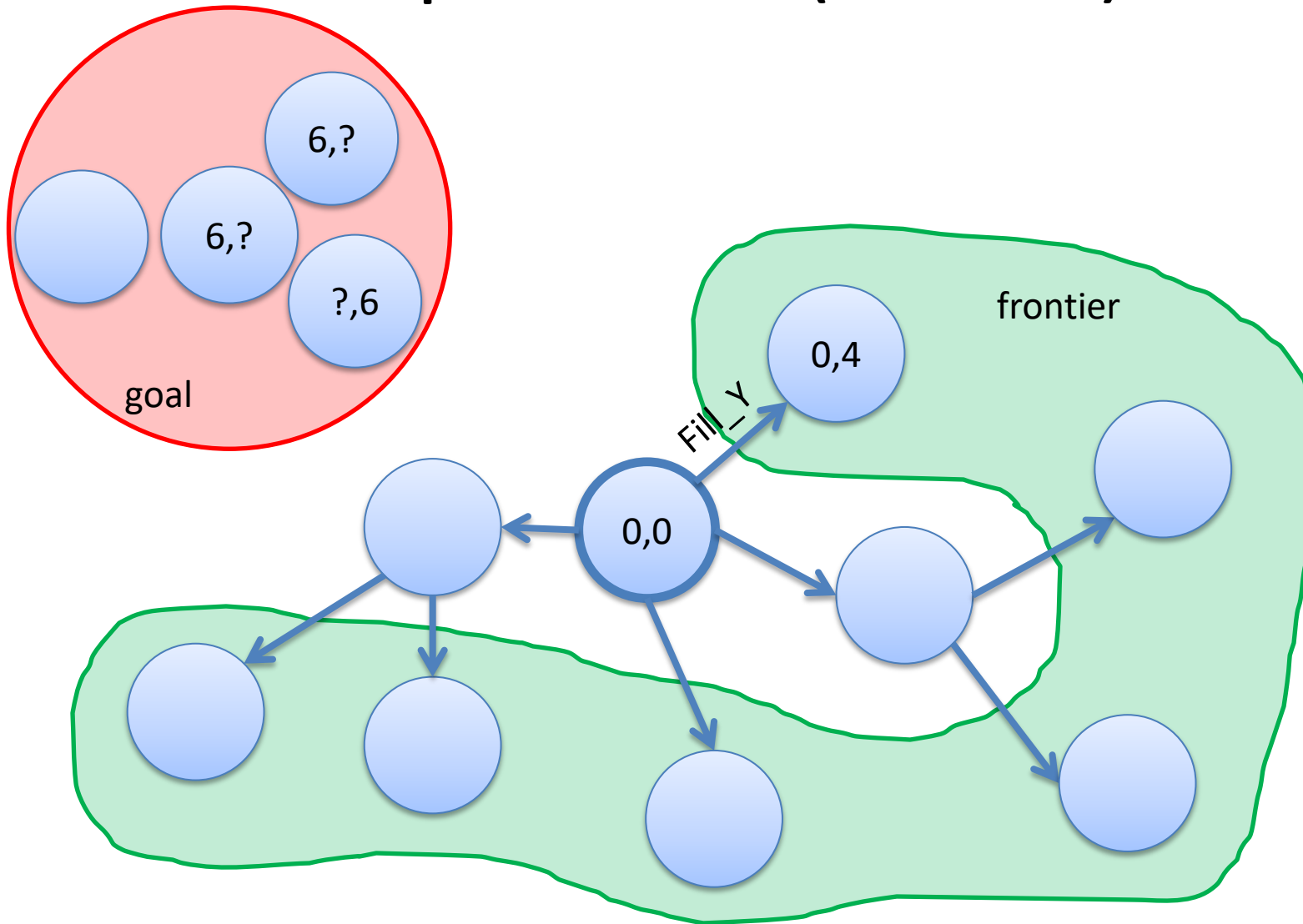
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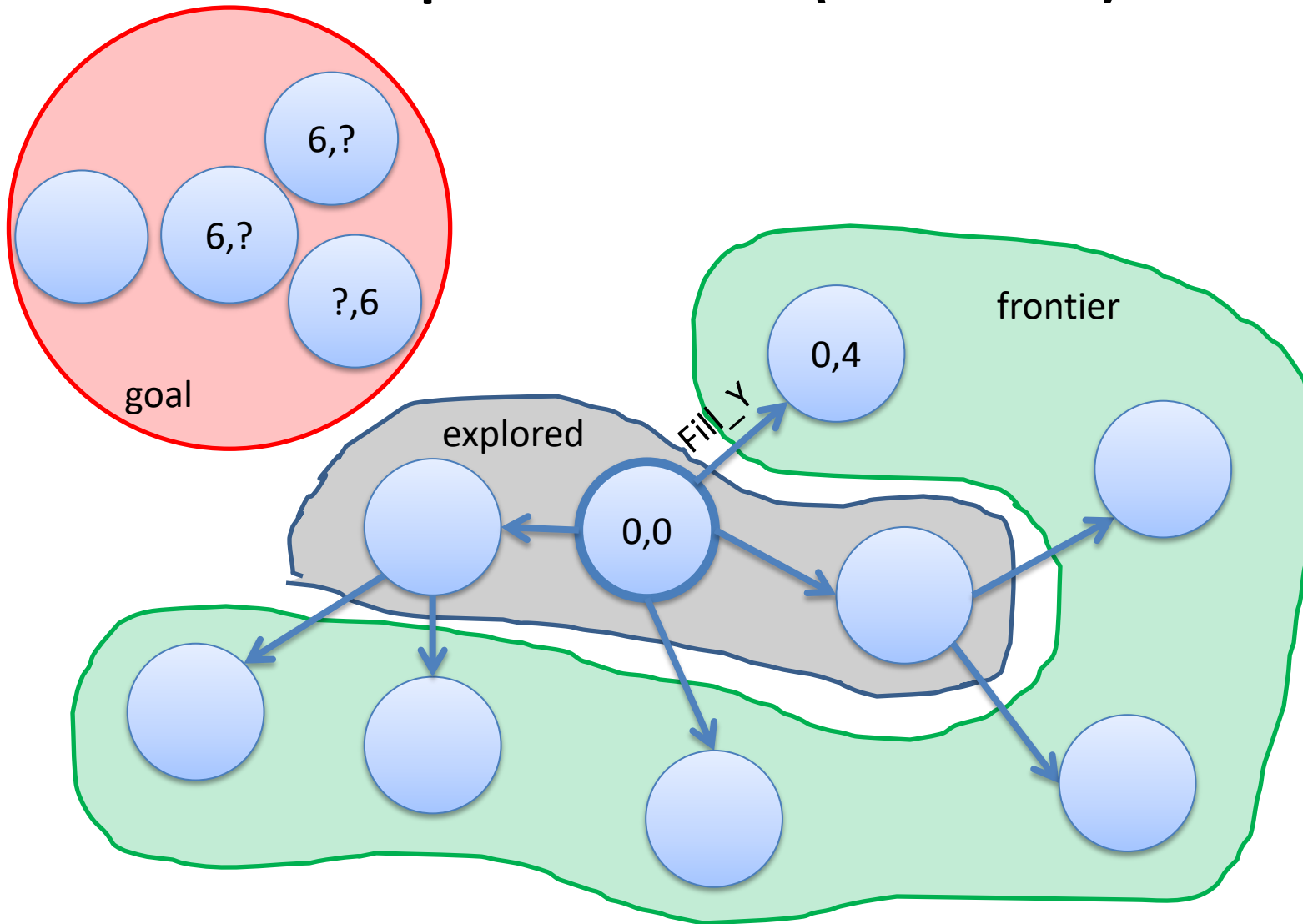
Exploration (Search)



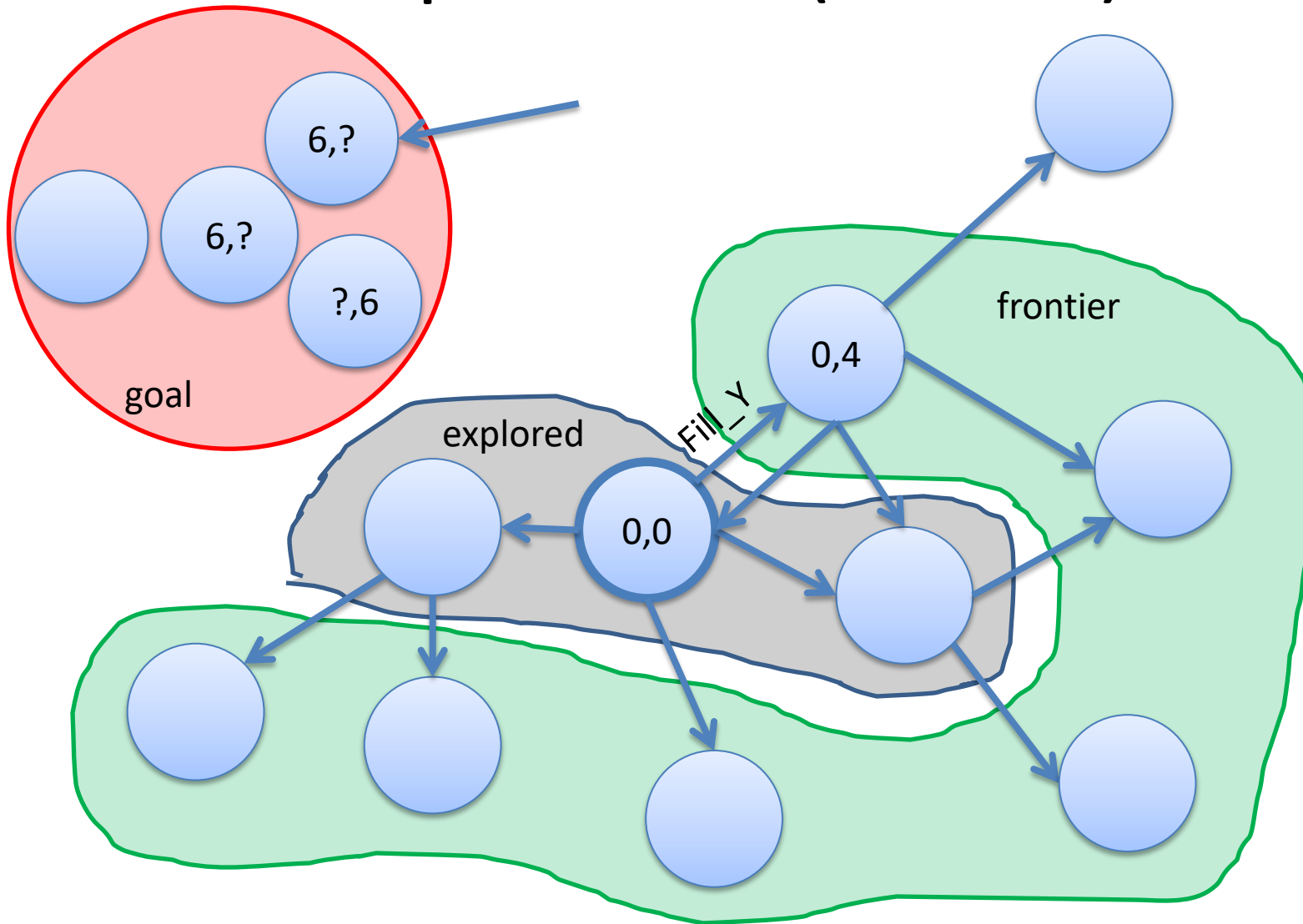
Exploration (Search)



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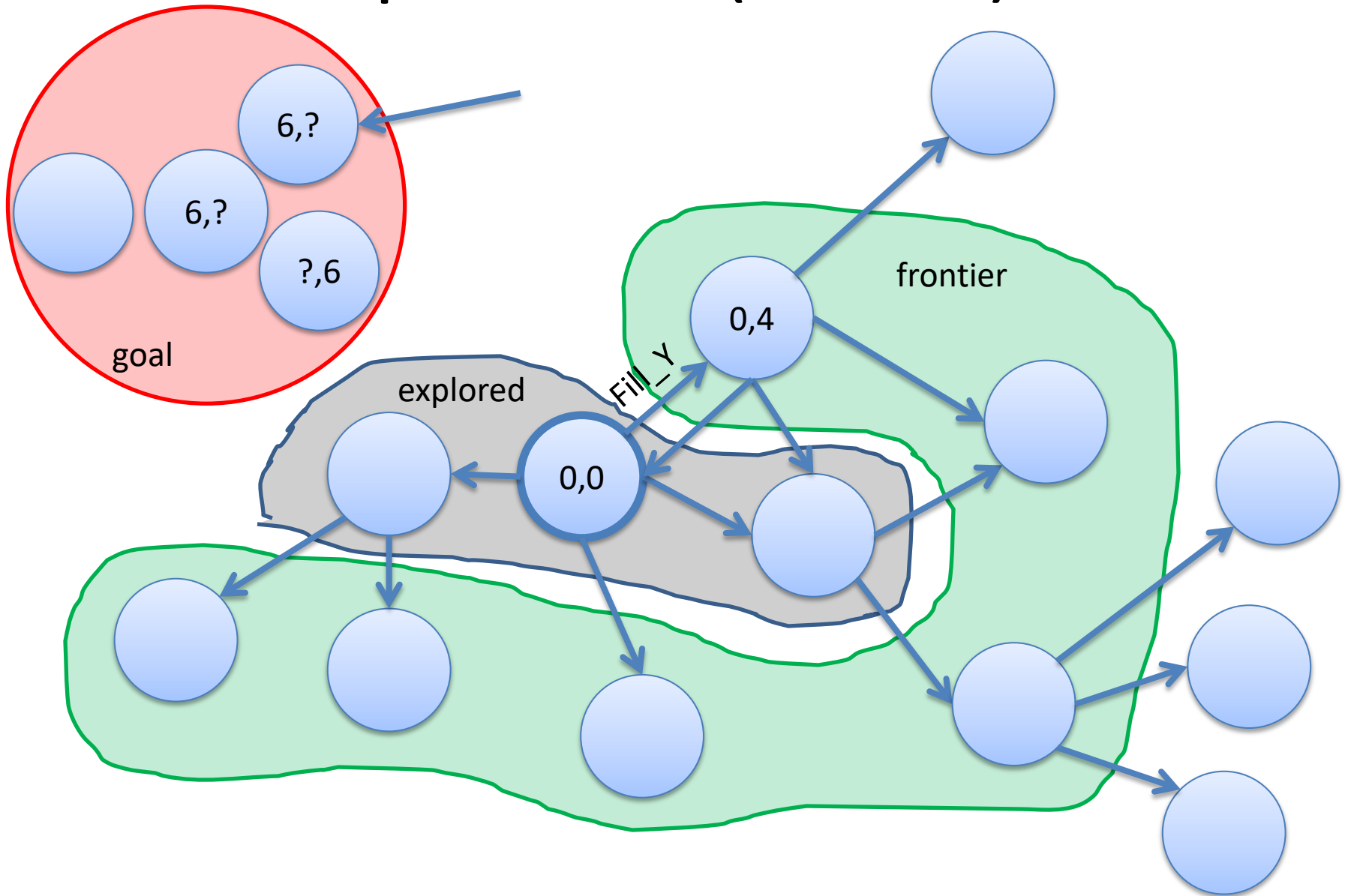
Exploration (Search)



Strategy

- Handle **'no solution'**
- Avoid **'infinite loops'**
- Go for the **'shortest path'**

Exploration (Search)



Exploration (Search)

