



SNS COLLEGE OF ENGINEERING

(Autonomous)

DEPARTMENT OF CSE-IoT ENGINEERING



Artificial Intelligence & Natural Language Processing

Uninformed & Informed Strategies

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Uninformed & Informed Strategies

AI problem-solving involves a series of distinct steps and methodologies that enable machines to understand, analyze, and resolve complex problems.

- Uninformed Strategies
- Informed Strategies



Uninformed Strategies

- The main role of uninformed search algorithms is to systematically explore the search space to find a solution, without using any domain-specific knowledge. While these algorithms may not always be the most efficient, they provide a baseline for understanding and solving complex problems in AI.



Uninformed search strategies use only the information available in the problem definition

- **Breadth-first search**
- Uniform-cost search
- **Depth-first search**
- Depth Limited Search
- Iteratively Deepening Search
- Bidirectional Search



Breadth – First Search

- Breadth-first search (BFS) is an important graph search algorithm that is used to solve many problems including finding the shortest path in a graph and solving puzzle games

Depth – First Search

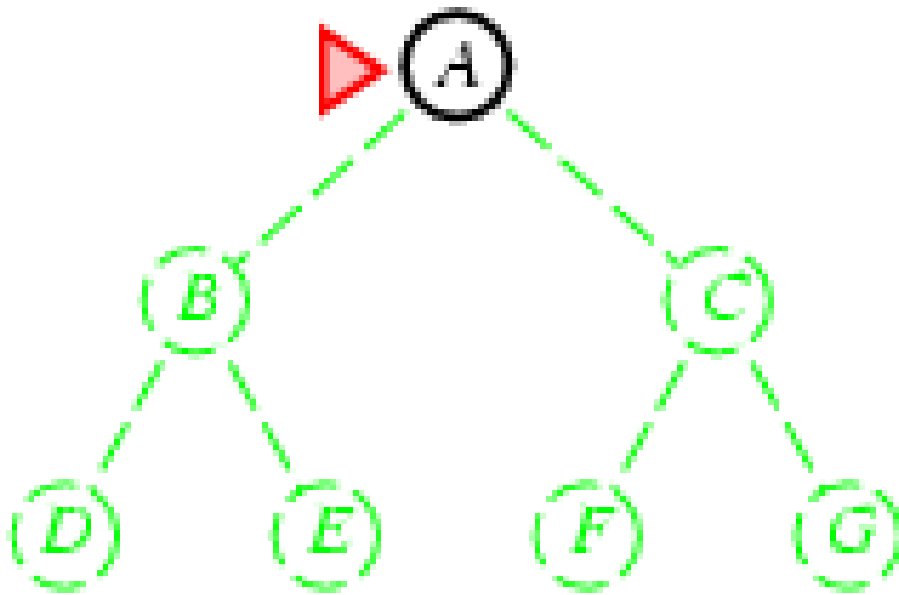
- Depth-first search (DFS) is an algorithm that explores a graph or tree data structure by starting at the root node and moving down each branch as far as possible. It's a recursive algorithm that uses backtracking to explore all possible paths.



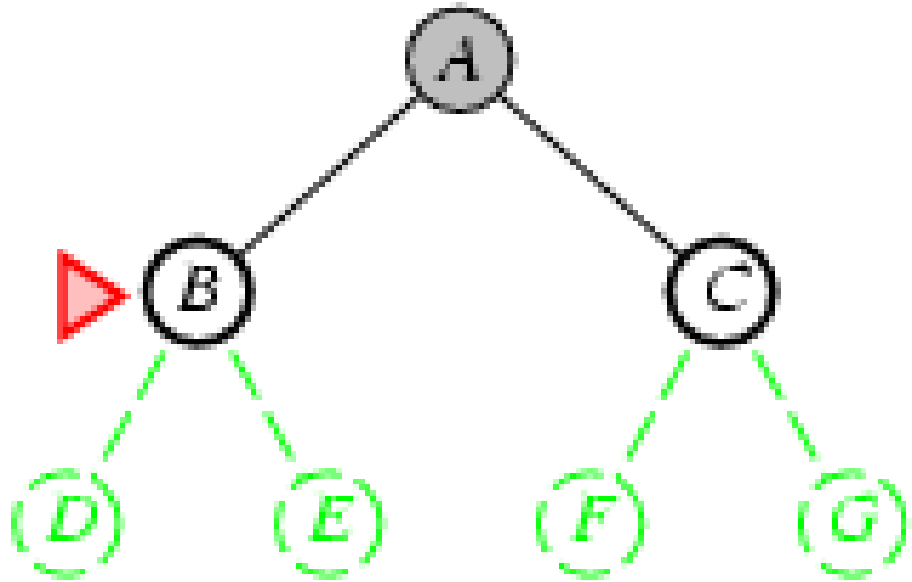
Breadth – First Search

- New Successors go at the end (FIFO)

Step: 1



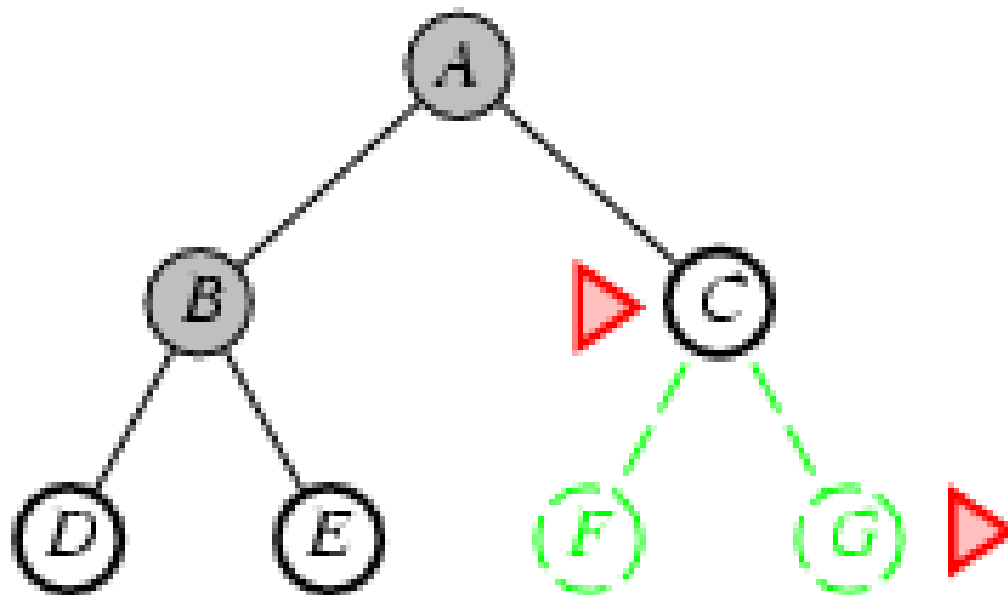
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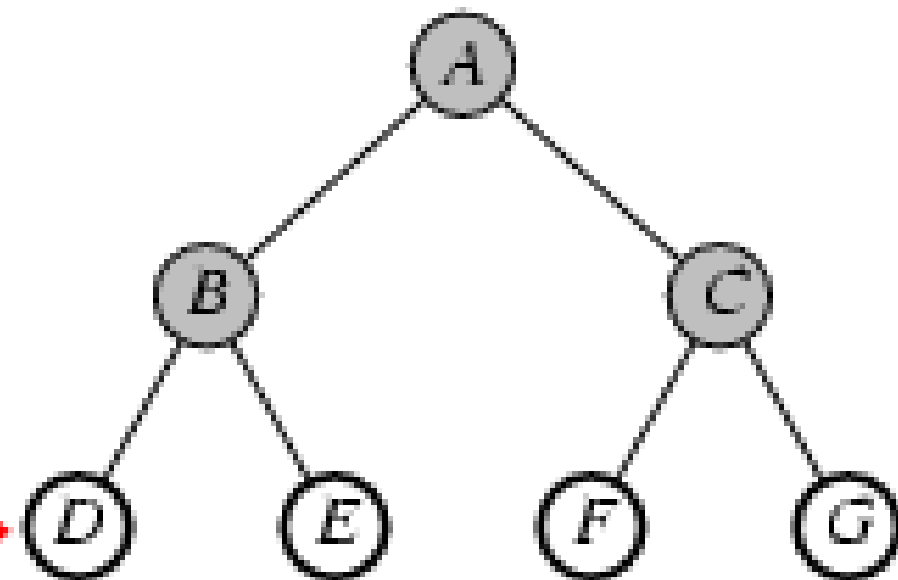
Breadth – First Search

- New Successors go at the end (FIFO)

Step: 3



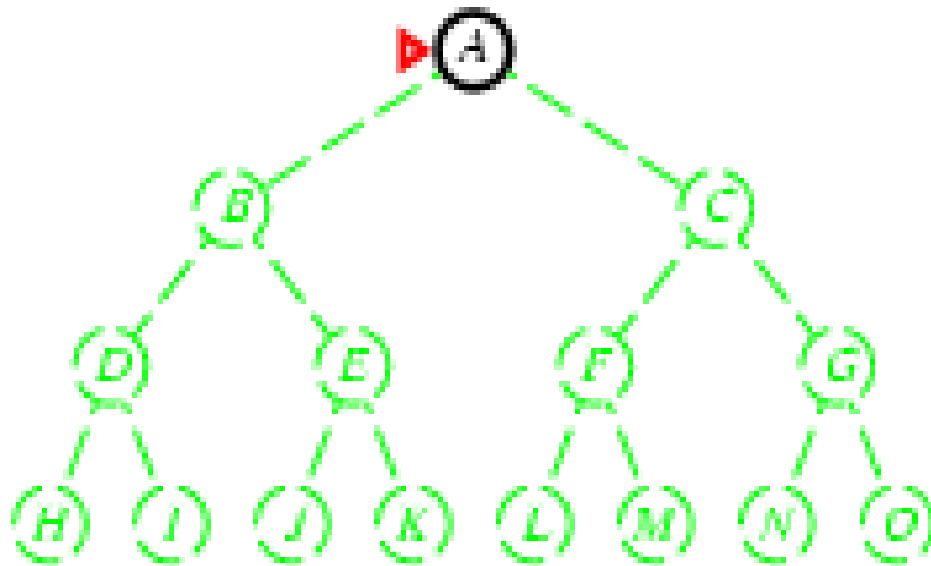
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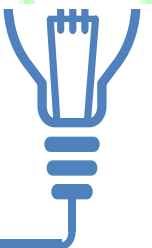
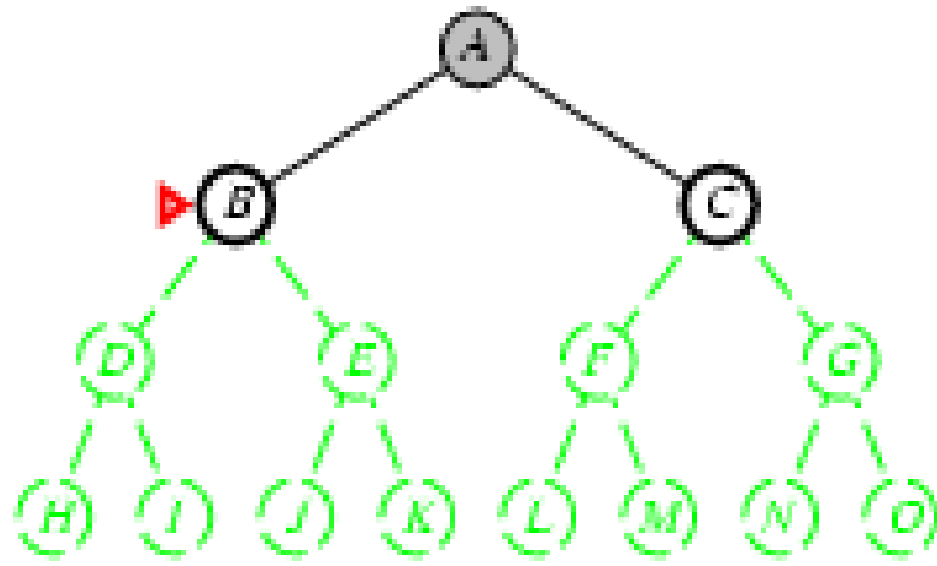
Depth – First Search

- Put Successors at First (LIFO)

Step: 1



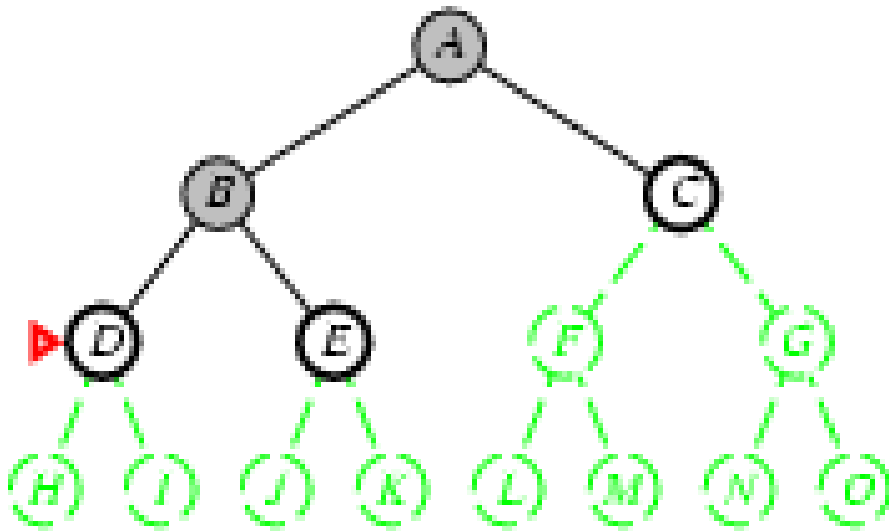
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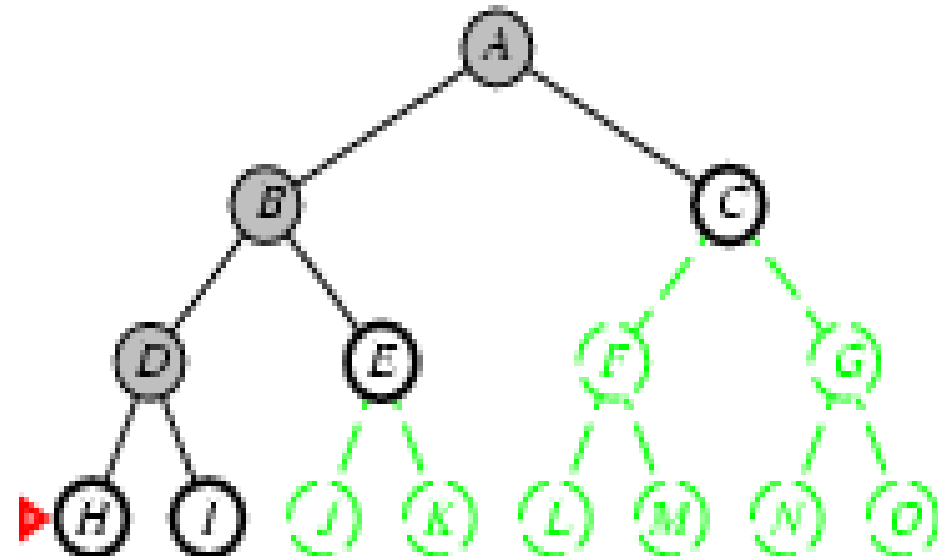
Depth – First Search

- Put Successors at First (LIFO)

Step: 3



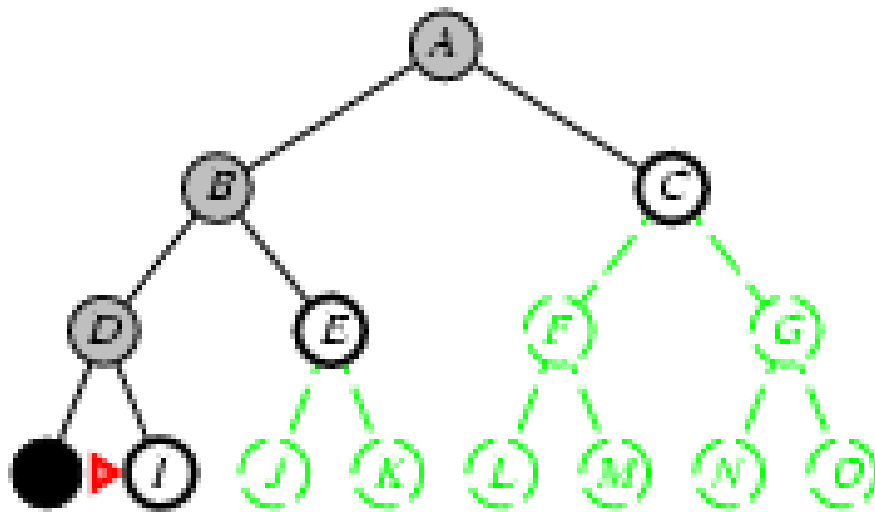
Step: 4



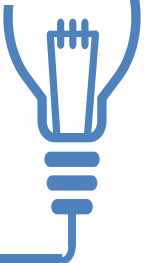
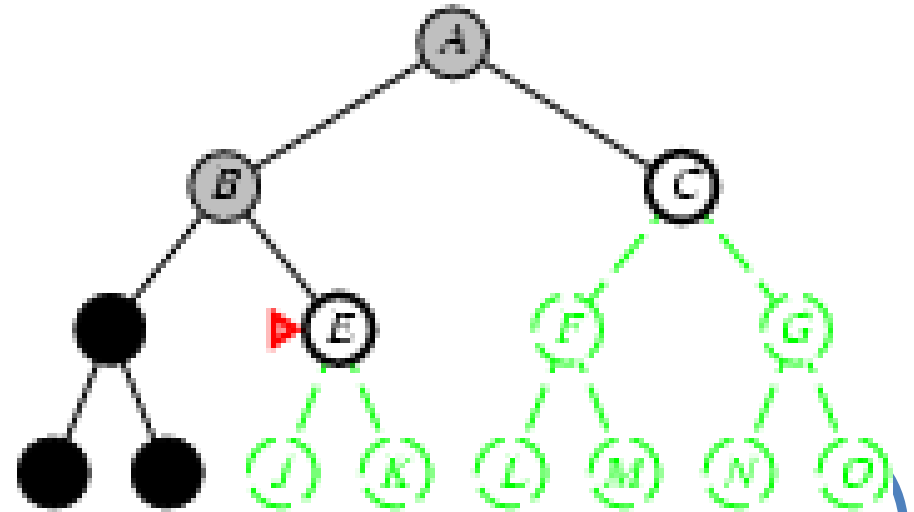
Depth – First Search

- Put Successors at First (LIFO)

Step: 5



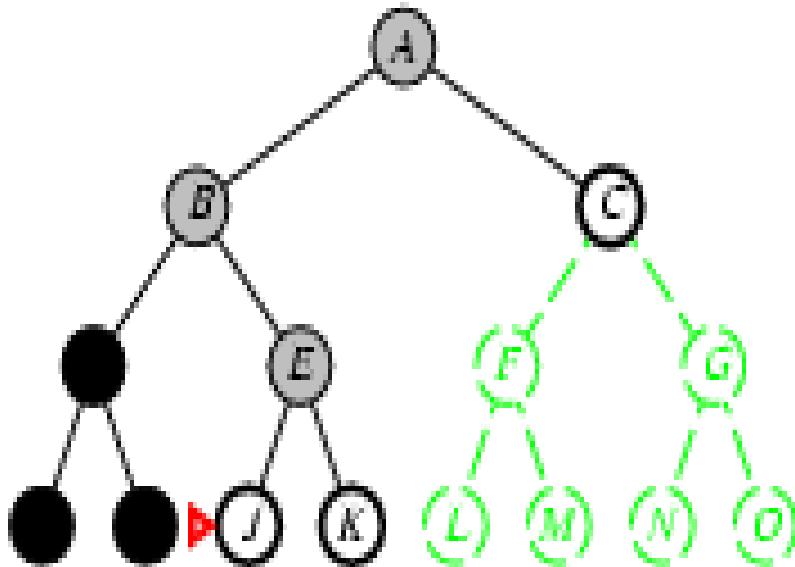
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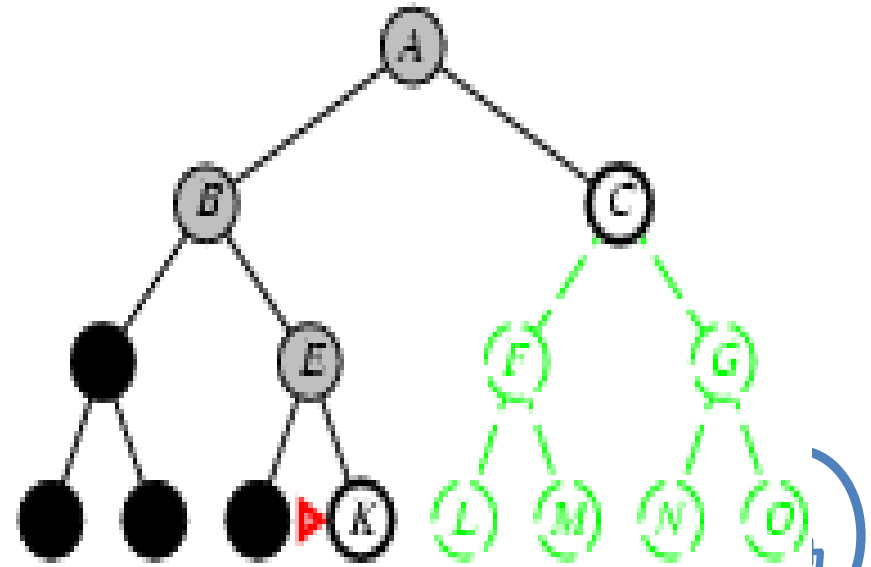
Depth – First Search

- Put Successors at First (LIFO)

Step: 7



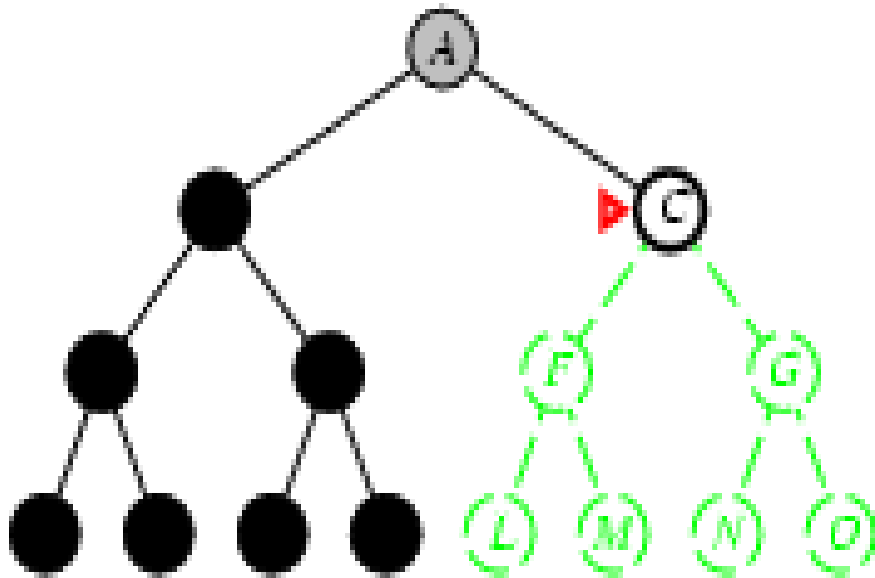
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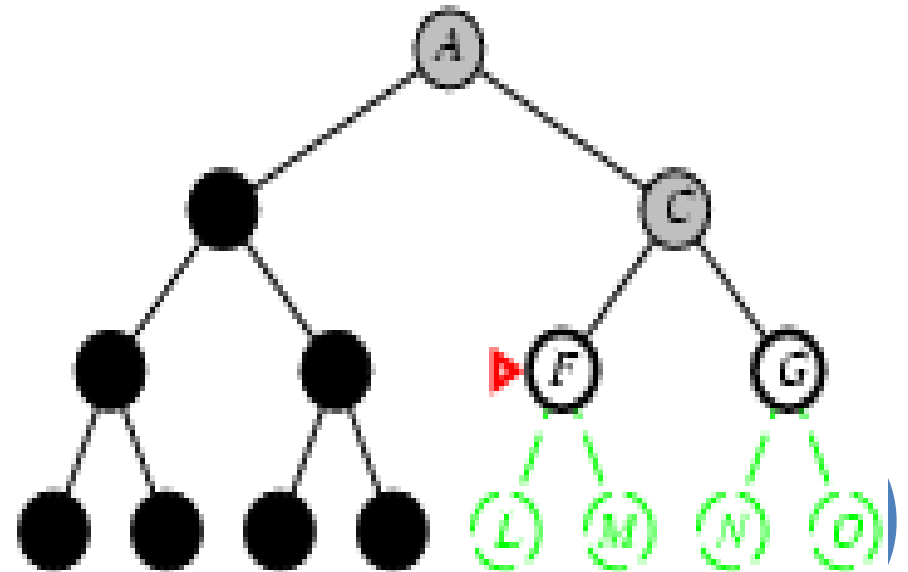
Depth – First Search

- Put Successors at First (LIFO)

Step: 9



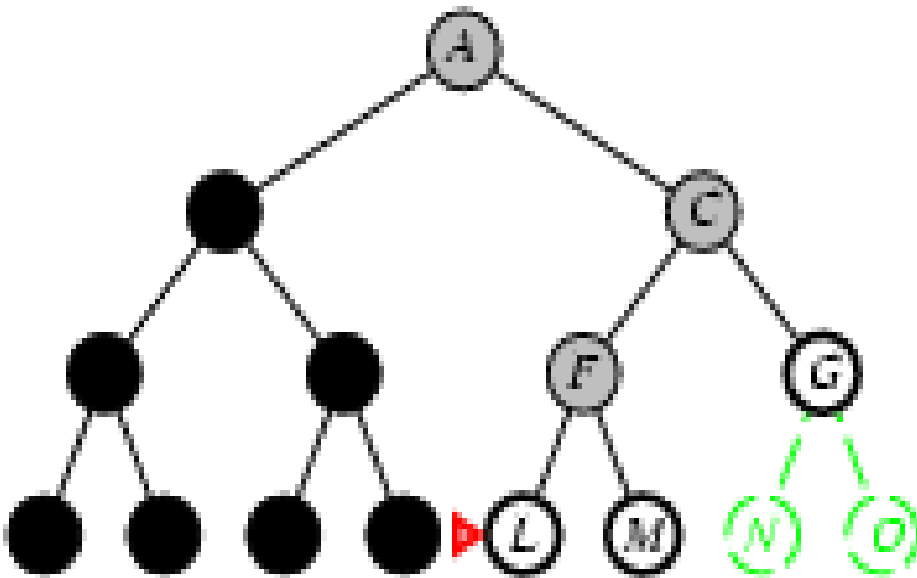
Step: 10



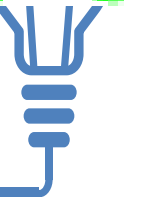
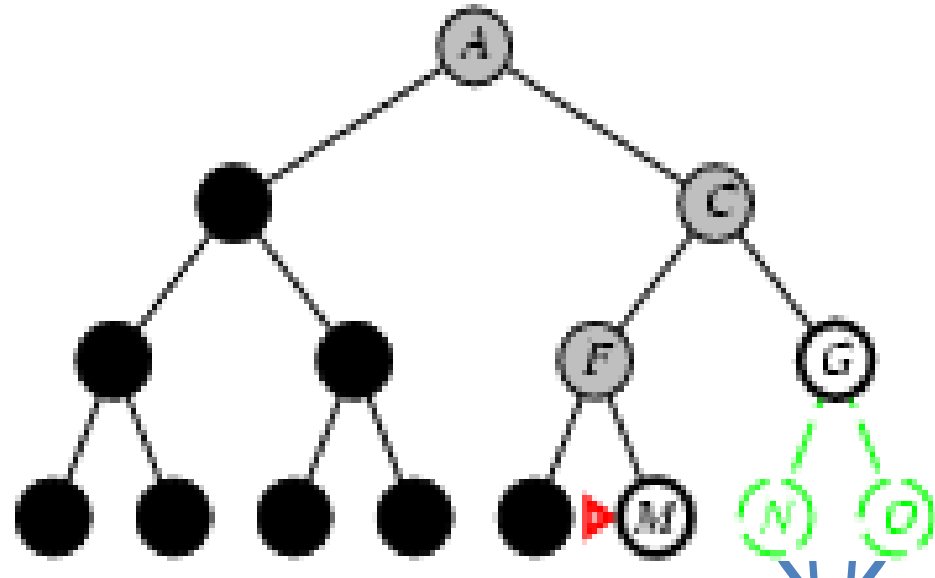
Depth – First Search

- Put Successors at First (LIFO)

Step: 11



Step: 12



Informed Strategies

- In AI, "informed strategies" primarily refer to search algorithms that utilize a heuristic function to estimate the cost of reaching a goal state, allowing them to make more efficient decisions by leveraging domain-specific knowledge.



Examples - Informed Strategies

- **A Search**

Considered the most widely used informed search algorithm, it balances the cost from the starting node to the current node with the estimated cost to reach the goal using the heuristic.

- **Greedy Best-First Search**

Prioritizes the node with the lowest estimated cost to the goal based on the heuristic, potentially leading to suboptimal solutions in some cases.

- **Hill Climbing**

Iteratively moves towards a state with a better heuristic value, often getting stuck in local optima.



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