



RAMA UNIVERSITY

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FACULTY OF ENGINEERING

ARTIFICIAL INTELLIGENCE
LECTURE-10

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OUTLINE

- ❖ **Uninformed/Blind Search**
- ❖ **Informed Search**
- ❖ **Uninformed Search Algorithms**
- ❖ **Breadth-first Search**
- ❖ **Advantages and Disadvantage**
- ❖ **MCQ**
- ❖ **References**



Uninformed/Blind Search:

The uninformed search does not contain any domain knowledge such as closeness, the location of the goal. It operates in a brute-force way as it only includes information about how to traverse the tree and how to identify leaf and goal nodes. Uninformed search applies a way in which search tree is searched without any information about the search space like initial state operators and test for the goal, so it is also called blind search. It examines each node of the tree until it achieves the goal node.

It can be divided into five main types:

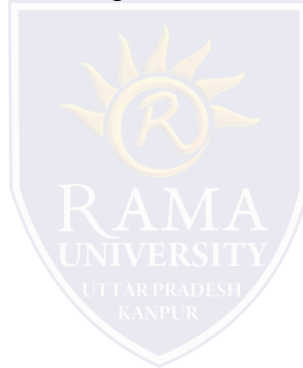
Breadth-first search

Uniform cost search

Depth-first search

Iterative deepening depth-first search

Bidirectional Search



Informed Search

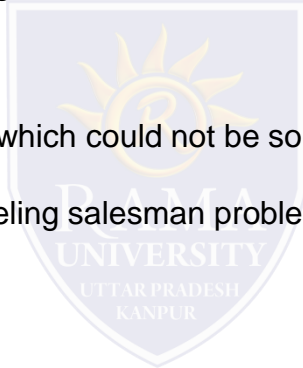
Informed search algorithms use domain knowledge. In an informed search, problem information is available which can guide the search. Informed search strategies can find a solution more efficiently than an uninformed search strategy. Informed search is also called a Heuristic search.

A heuristic is a way which might not always be guaranteed for best solutions but guaranteed to find a good solution in reasonable time.

Informed search can solve much complex problem which could not be solved in another way.

An example of informed search algorithms is a traveling salesman problem.

- Greedy Search
- A* Search



Uninformed Search Algorithms

Uninformed search is a class of general-purpose search algorithms which operates in brute force-way.

Uninformed search algorithms do not have additional information about state or search space other than how to traverse the tree, so it is also called blind search.

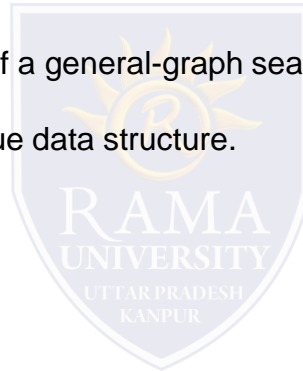
Following are the various types of uninformed search algorithms:

- Breadth-first Search
- Depth-first Search
- Depth-limited Search
- Iterative deepening depth-first search
- Uniform cost search
- Bidirectional Search



Breadth-first Search

- Breadth-first search is the most common search strategy for traversing a tree or graph. This algorithm searches breadth wise in a tree or graph, so it is called breadth-first search.
- BFS algorithm starts searching from the root node of the tree and expands all successor node at the current level before moving to nodes of next level.
- The breadth-first search algorithm is an example of a general-graph search algorithm.
- Breadth-first search implemented using FIFO queue data structure.



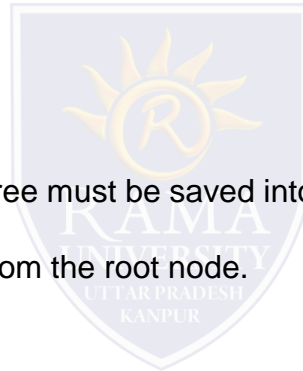
Advantages and Disadvantage

Advantages

- BFS will provide a solution if any solution exists.
- If there are more than one solutions for a given problem, then BFS will provide the minimal solution which requires the least number of steps.

•Disadvantages

- It requires lots of memory since each level of the tree must be saved into memory to expand the next level.
- BFS needs lots of time if the solution is far away from the root node.



1. PROLOG is an AI programming language, which solves problems with a form of symbolic logic known as predicate calculus. It was developed in 1972 at the University of Marseilles by a team of specialists.

Can you name the person who headed this team?

- a) Alain Colmerauer
- b) Niklaus Wirth
- c) Seymour Papert
- d) John McCarthy

[View Answer](#)

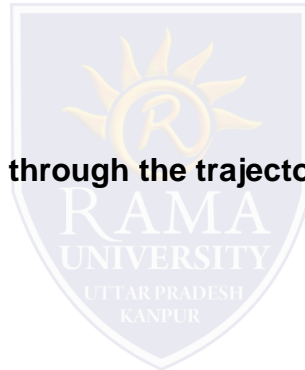
2. Programming a robot by physically moving it through the trajectory you want it to follow be called

- a) contact sensing control
- b) continuous-path control
- c) robot vision control
- d) pick-and-place control

[View Answer](#)

3. To invoke the LISP system, you must enter _____

- a) AI
- b) LISP
- c) CL (Common Lisp)
- d) Both LISP and CL



4. In LISP, what is the function (list-length <list>)?

- a) returns a new list that is equal to <list> by copying the top-level element of <list>
- b) returns the length of <list>
- c) returns t if <list> is empty
- d) all of the mentioned

5. ART (Automatic Reasoning Tool) is designed to be used on _____

- a) LISP machines
- b) Personal computers
- c) Microcomputers
- d) All of the mentioned



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