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Assignment No. 2

Title

Implementation of Minimax algorithm.

FAQs

1. Compare informed search and adversarial search.

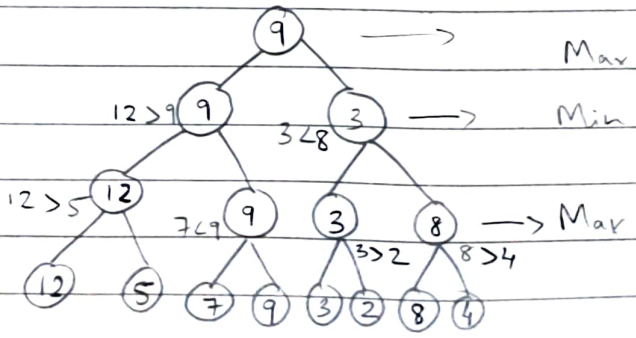
Informed search, also known as heuristic search, uses problem-specific knowledge (heuristics) to find solutions more efficiently. The goal is typically to find the optimal path to a solution in problems like pathfinding, puzzle-solving etc. E.g. A* search, Greedy Best First Search. These searches use a heuristic function (e.g. estimated distance to goal) to guide the search process.

Adversarial search is used in situations where there are two or more agents with conflicting goals. The goal is to maximise one's own outcome while minimising the opponent's outcome. E.g. Minimax algorithm and Alpha-Beta pruning. These algorithms consider the possible actions of the opponent, anticipating their moves and countering them.

2. Explain Minimax algorithm with example.

The Minimax algorithm is used in two-player, turn-based games to determine the optimal move for a player assuming that the opponent also plays optimally.

The algorithm explores all possible moves and their outcomes, assigning a value to each state.



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3. Explain Alpha - Beta Pruning.

It is an optimisation technique for the Minimax algorithm that reduces the number of nodes evaluated in the game tree.

Alpha (α): Represents the best value that the maximising player can guarantee at that point.

Beta (β): Represents the best value that the minimising player can guarantee at that point.

It works on the condition that if $\alpha \geq \beta$ then there is no need to explore the child node, and it can be pruned.

In practice, Alpha-Beta pruning can speed up the search process, especially in large game trees, by ignoring moves that won't be selected by rational players.

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30/08