Page No.
Date

Experiment 4

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Aim : To implement local search algorithm: Hill climbing.

Theory : Hill climbing is a local search algorithm in AI to find the best possible solution to a problem. It is named after the idea that it climbs the hills of search space to find the most optimal solution but it can have limitations and may not be always find the global optimum. Current state begins with an initial state and explores the best neighbour iteratively to determine its next move.

Objective function - To evaluate the quality of a state, the goal is to maximize or minimize this function. It guides the searching towards better solutions

Advantages :-

Simplicity - It is straight forward to implement and understand.

Efficiency - It can quickly find local optimum due to its simple structure

Disadvantages.

i) Limited Exploration - It only considers the best immediate neighbours, hence entire graph cannot be explored.

ii) local optimum - It is prone to getting stuck in the local optimum and can miss the global optimum

iii) Dependency on initial state.

iv) It does not maintain a history of visited states.

Conclusion : Hence, we have implemented the local search algorithm, Hill climbing.