EXPERIMENT 7

Postlab

1. What are the advantages and disadvantages of state space search?

2. What are the advantages and disadvantages of the Hill Climbing approach?

3. Describe variations of Hill Climbing approach

4. Solve the Block World problem by using the STRIPS method.

Name: Namrata G. Joshi
ROLL NO: 9545
TE comps A

DATE

Expt-7

PostLab:-

(1) What are advantages and disadvantages of state space search ?.

Advantages

① Guaranteed to find a solution if one exists
② Can find the best solution
③ Adoptable to various problem domains
④ Suitable for wide range of problems

Disadvantages

① Computationally expensive for large problems
② High memory usage for large spaces
③ Effectiveness relies heavily on heuristic quality
④ Complexity varies making algorithm design challenging

(2) What are advantages and disadvantages of Hill Climbing approach?

Advantages

① Simplicity:- Hill Climbing is easy to understand and implement making it suitable for simple optimisation problems
② Hill Climbing typically requires minimal memory making it suitable for resource constrained environments
③ It involves minimal computational overhead making it efficient for real-time or embedded systems

Disadvantages

① Hill climbing is prone to getting stuck in local optimal failing to find optimal path in non-convex search spaces

(2) It lacks mechanisms for backtracking, meaning it cannot escape from local optimal once reached
(3) Hill climbing only explores neighbouring solutions which may lead to missing potentially better solutions that are further away
(4) There is no guarantee that Hill climbing with find the optimal solution even if it configures

(3) Describe variations of Hill climbing Approach
(1) Iteratively selects the first neighbouring solution that improves upon the current state but may get stuck at local optima
(2) Performs Hill climbing searches from different initial states to migitate the risk of getting stuck is local optimal
(3) Introduces randomness to allow acceptance of coorst solutions with a certain probability facilitating escape from local optima
(4) combines hill climbing with permutation techniques to escape local optima by periodically restarting the search from different points in the solution space

(4) Solve the block world problem by using STRIPS method
Block world problem using the (Stanford Research Institute problem solver)

Initial state:-	Goal state:
On (A, Table)	On (A, B)
On (B, Table)	On (B, Table)
On (C, table)	On (C, Table)