Rohit Kulkarni 41346

AIR ASSIGNMENT 4

TITLE : Hill Climbing Algorithm

PROBLEM STATEMENT:

Use heuristic search to implement Hill Climbing Algorithm.

OBJECTIVES:

To understand & implement hill climbing algorithm.

OUTCOMES:

Students will understand the Hill climbing algorithm & will be able to implement it.

S/W & H/W REQUIREMENTS:

Python 3, 64 bit OS Linux/Unix, 8GB RAM, editor, keyboard, mouse, monitor.

THEORY:

i] In numerical analysis, hill climbing is a mathematical optimization technique which belongs to family of local search.

ii] It is an iterative algorithm that starts with an arbitrary solution to a problem, then attempts to find a better solution by making an incremental change to the solution.

iii] If the change produces a better solution, another incremental change is made to the new solution, until no durther improvements can be found.

Date:

i] A heuristic function will rank all possible alternatives at any branching step in a search algorithm based on available information, ie., it helps the algorithm to select the best route out of all possible routes

ii] Hill climbing algorithm is a variant of ~~all~~ the generate and test algorithm.

iii) It also uses greedy approach.

iv] Simple hill climbing examines neighbouring nodes one by one, and selects the first neighbouring node which optimizes ~~to~~ current cost as next node.

ALGORITHM:

1] Evaluate the initial state.

2] If it is the goal state, then stop & return

Else,
Make initial state as current state.

3] Loop until the solution state is found, or there are no new operators present which can be applied to current state.

i] Select a state that has not yet been applied to the current state & apply it to produce new state.

ii] Evaluate new state.
a] If the current state is new state, stop & return.
b] If it is better than cs, make it cs & proceed.
c] If not better, continue in loop.

4] Stop.

CONCLUSION:
Hill climbing algorithm was successfully understood & implemented.