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classmate

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Answer) Task environment of the following agents are specified through their respective PEAS.

Agent Type	Performance Measure	Environment	Actuators	Sensors
Automated Taxi driving agent	Safe, fast + legal, comfortable trip, maximize profits	Roads, other traffic, pedestrians, customers	Steering, accelerator, brake, signal, horn, display	Cameras, GPS, Sonar, Speedometers, odometers, engine sensors, Keyboard.
chess playing agent (with a clock)	time, rules,	Board, clock, players,	next player move	Brain,
part picking Robot	percentage of parts in correct bins	Conveyor belt with parts, bins	jointed arm and hand	Camera, joint angle sensors.

Ques

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Criterion	BFS	UCS	DFS	DLS	IDS	BDS
Complete	(Yes) ^a	(Yes) ^{a, b}	No	No	(Yes) ^a	(Yes) ^{a, d}
Time Complexity	$O(b^d)$	$O(b^{+(c/d)})$	$O(b^m)$	$O(b^d)$	$O(b^d)$	$O(b^{d/2})$
Space Complexity	$O(b^d)$	$O(b^{+(c/d)})$	$O(b_m)$	$O(b^d)$	$O(b^d)$	$O(b^{d/2})$
Optimal	Yes ^c	Yes	No	No	Yes ^c	Yes ^{c, d}

$b \rightarrow$ branching factor
 $d \rightarrow$ depth of the shallowest solution
 $m \rightarrow$ max. depth of search tree
 $l \rightarrow$ depth limit
 $a \rightarrow$ Complete if b is finite
 $b \rightarrow$ Complete if step costs $\geq E$ for $E > 0$
 $c \rightarrow$ optimal if step costs are same
 $d \rightarrow$ if both direction w BFS

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Hill climbing algorithm is a local search algorithm is a local, which continuously moves in the direction of increasing elevation/value to find the peak of the mountain or best solution to the problem. It terminates when it reaches a peak value where no neighbor has a higher value.

It is considered as a beyond classical approach because it depends on initial state, can get stuck in local maxima/minima in the direction which optimize ~~edges~~ the cost.

Three important issues and their remedial measures are:-

- ① Local maximum:-
Solⁿ) Backtracking technique can be solution
- ② Plateau:-
Solⁿ) Plateau is to take big & steps or little steps to solve Randomly select a state which is far away.
- ③ Ridges
Solⁿ) With the use of bidirectional search, or by moving in different directions, we can improve this.