

AI Theory Assignment 1

Page No. _____
Date: / /
Divya Sunil Goyal
PD-29, D3

Q1

Q1] Explain the classification of environments in detail & also explain PEA's analysis for auto-mated taxi agent.

Ans) We know that there are different types of agents in AI. PEA's system is used to categorize similar agents together. The PEA's system delivers the performance measures with respect to environment, actuators & sensors.

1) Performance Measure: It is a unit used to define how much successful an agent is.

2) Environment: It is surrounding of an agent at every instant. It keeps changing with time if agent is set in motion. There are five major types of environments.

- 1) Fully Observable & Partially Observable.
- 2) Sequential
- 3) Static & Dynamic
- 4) Discrete & Continuous.
- 5) Deterministic & Stochastic.

3) Actuators: It is part of the agent that delivers the output of an actuator to environment.

4) Sensors: They are receptive parts of an agent which are taken in the impact of agent.

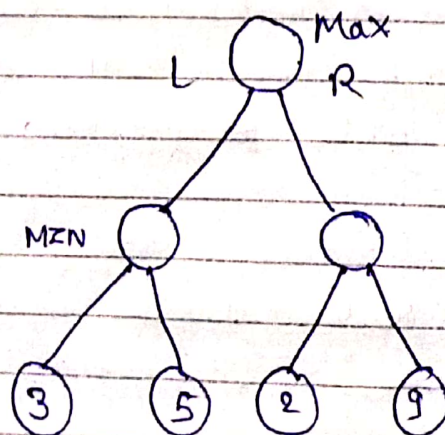
(Q2) Defines heuristic method and explain admissible property of A^* algorithm in detail.

Ans) An admissible heuristic is used to estimate the cost of reaching the goal state in an informed search algorithm. In order for a heuristic to be admissible in the search problem, the estimate cost of reaching the goal state.

A^* is guaranteed to return a lowest cost path from start to goal. & Typical implementation of A^* uses a priority queue to perform repeated situation of minimum cost nodes to expand.

(Q3) Explain min-max algo with example.

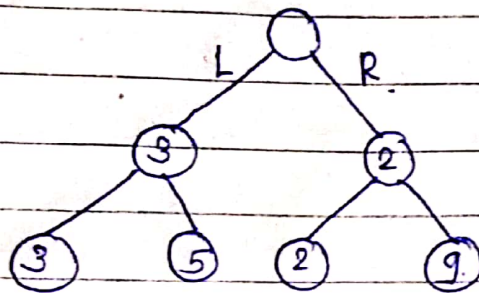
Ans) Consider a game which has 4 final states & paths to reach final state are from root to 4 leaves of a perfect binary tree as shown below.



Since this is a backtracking algorithm, it tries all possible moves, then backtracks & makes a decision.

1) Maximizer goes left: It now minimizes the left side & makes a choice betⁿ 3 & 5, Hence 3 is minimum so it gets chosen.

ii) Maximizer goes right - It is now the minimizer's turn. It has to make a choice betⁿ 2 & 9 so 2 gets selected.



Being the maximizer you would now choose the layer value that is 3. Hence the optimal move for maximizer is to go left & optimal value is 3.