## AI Assignment -1 Hauch Pauman 9163

> 1. Rationality in Intelligent ideants:

Rationality in the content of itelligent agents report to the ability of an agent to make decisions that maximize its enputed utility or achieve its goals in a given als environment.

A rational agent is one that acts in a way that is most likely to achieve its intended objectives, give its perception of the world & its internal knowledge & capabilities

for example:

orn a chess playing agent, rationality would involve selecting moves that maximizes the probability of winning the game.

In a self driving ear, rational behaviour would entoil tollowing traffic rules & asiding accidents to reach the destination safety & efficiently.

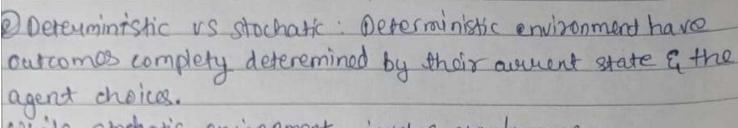
DEnvisonments in which intelligent agents operates can very widely in their characteristics which significally influence design & behavioured agents.

1) Characteristic defining environments includes:

(1) Observable vs partially obserable: An environment is

stare, while its partially observable if the agent has

limited or complete information.



while stochatic environment involve randomness

3) Episodic VS sequential: In episodic environments, each .
action's outcome depends only the amount episode, whereas

is sequential environments, action affect future states.

a) static vs dynamic : static envisorments do not change while the agent is deliterating, while dynamic envisorments may change unpredicately.

( A chess is a deterministic, fully deserveable, & sequential

environment

Examples:

@ A stock market is stochastic, partiely observable & dynamic.

3 4 mage solving robot operats in a pautially observable, deterministic & sequential environment.

Intelligent agents typically consist of several components:

O Perception: Gathering Info about the environment Annough

Pknowledge-hase: Internal representation of the world including paut so omperieros Edomain-specift knowledge.

3) Domain-making: Process of Selecting actions based on

available information & goals

DActuatous: Mechanisms through which the agent interacts

Types of agents	
D Reactive agents: React to the current state of the	
environment without maintaining an internal state orm	emog
Doublevarine agents: use internal representation to plan act	
based on anticipated future states	10 30
Bleauning agents: Improve their performance over time thro	ugh
experience & adaption.	
Examples:	atele
Of relative vaccum dearon that responds to dist detation without planning.	0
without planning.	3011
Dr delibrative reute-danning system that considers traffic	
contlition & long term goal.	
1) Problem solving agent analyse problems by defining states	actions
They employ various rearch algorithm to implore the space of	
possible solution & find.	TO THE
3 teps in problem solving by seauching.	
O formulation: - Defining the problem by openfying the initial state,	40
2 3 couch Employing the state space to finder sequence of act	on
loading from the litial states 1	ph.
B Solution: Entractiona so solution path from the search tree	00
Strategies employed:	
Breath-first search: Expords all nodes at a given depth by	ore
moving to the next level. backtract	
Doepth-first seauch: explores as for as possible along each branch be	tore
Heuristic search: uses domain-specific knowledge to guide the search towards promising area of state space.	