

AI Assignment - 7

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Aim: Discuss sample architecture of sensor/ actuators which are operated by AI agents function and the characteristics, types of agents & optimization of agent functions by feedback learning.

Objectives:

- 1.) Understand agents in AI.
- 2.) Discuss Examples.
- 3.) Recognize types of agent
- 4.) Understand Conceptual components of agents.

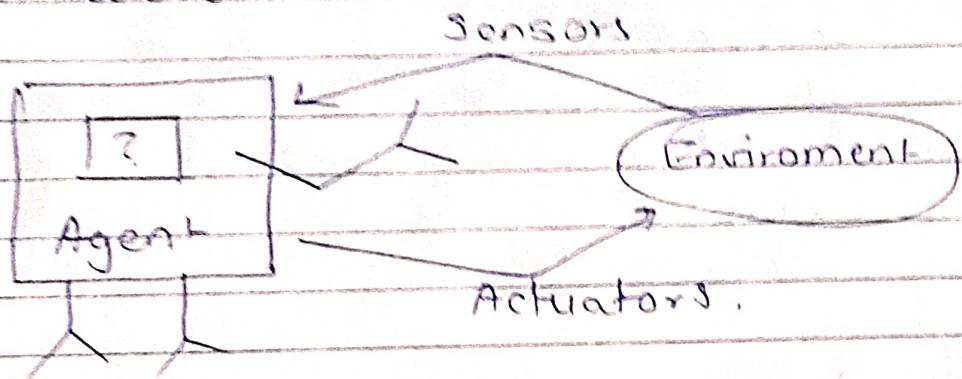
Theory:

AI is defined as study of the rational agents. Rational agents could be anything that makes decisions as a person, firm machine or structure. It carry out action with best outcome after considering past and agent & its environment agents act in their environment.

Agent is anything that can be viewed as -

1) Perceiving its environment through sensors

2) Acting upon that environment through actuators.



To understand structure of the intelligent agents we should be familiar with architecture of agent programs.

Agent → Architecture + Agent Program

Examples of Agents:

1) Software agents has keystores, file contents received network packages which act as sensors and display on screen

2) Human agent has eye, ear & other organs which acts as sensors & hand, legs act as actuators

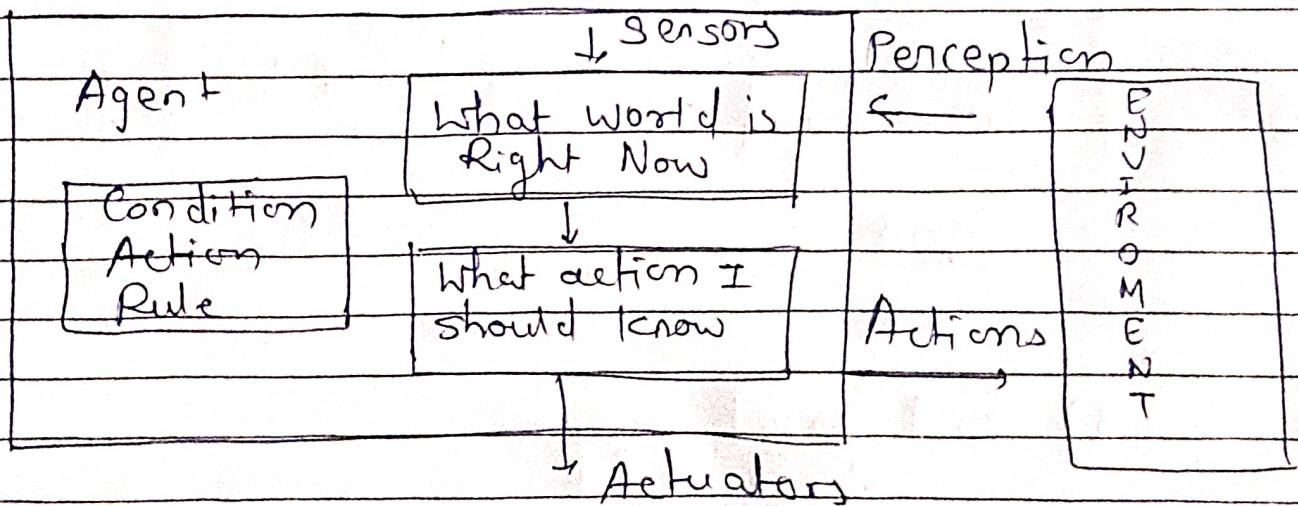
Types of Agent :

1.) Simple Reflex Agent :

It ignores rest of the history & act on the basis of current percept, history of all agents has perceived to date. Agent function is based on condition action rule. If condition is true then action is taken else not. It succeeds when environment is fully observable.

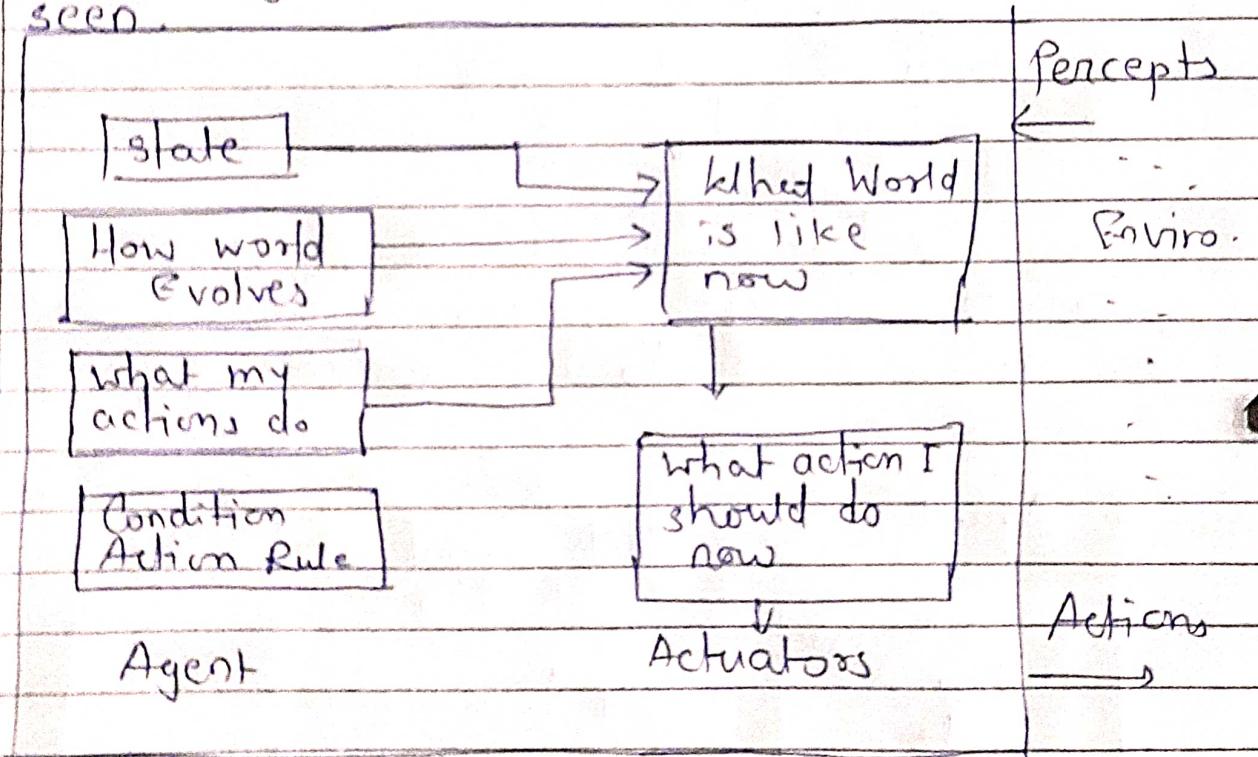
Problems :-

- (1) Limited intelligence
- (2) No knowledge of non-perceptual parts of state
- (3) Too big to generate & store.
- (4) If change occurs in environment then rules need to be updated.



2) Model based reflex agent :

It works by finding rule whose condition matches current situation. It can handle partially observable environments by use of model about world. It has to keep track of internal state which is adjusted by each percept and that depends on percept history. Current state is stored inside agents' which maintain some kind of structure describing part of world which can't be seen.

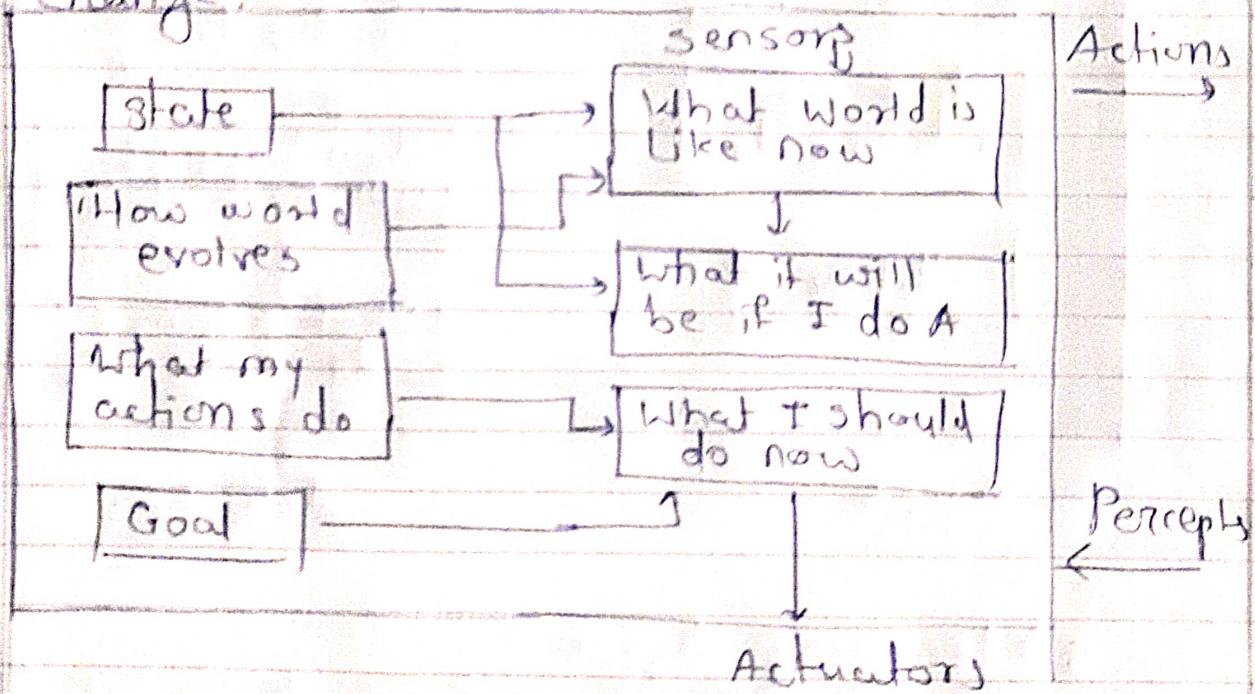


3.) Goal based agent :

These kind of agents take decisions based on how far they are currently from their goal. every action

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is intended to reduced its distance from goal this allows agent way to choose among multiple possibilities selecting one which reaches goal state knowledge that supports it decisions is represented explicitly & can be modified & which makes these agents more flexible They usually require search and planning Its behaviour can easily change.



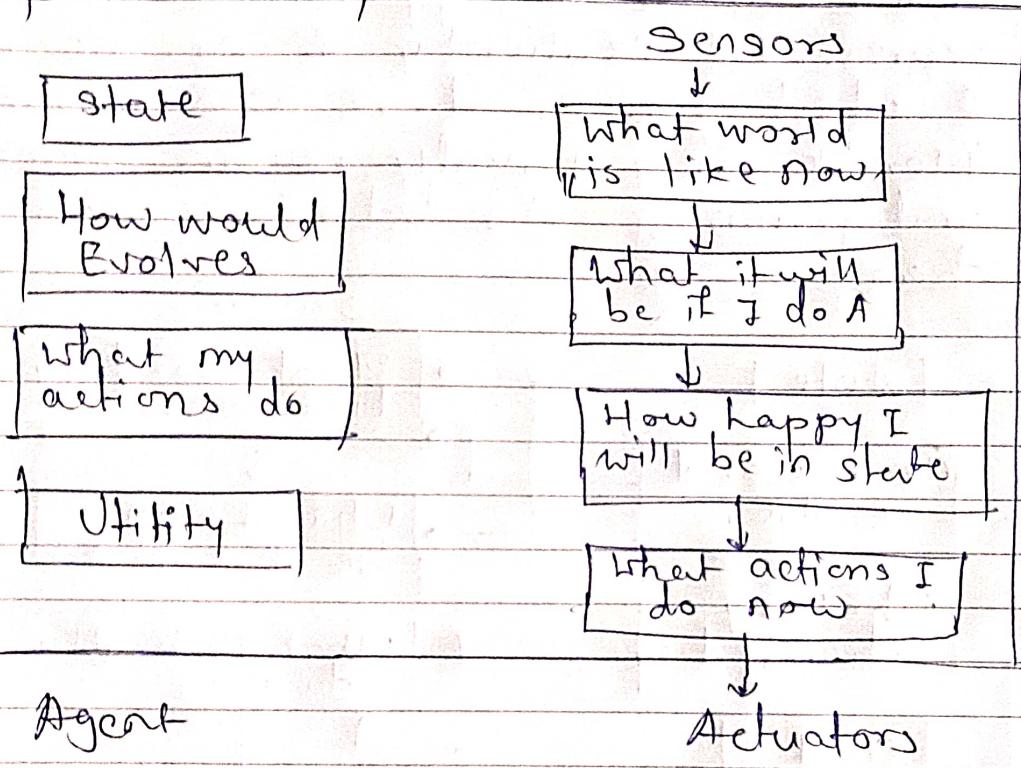
4) Utility based agents :-

Agents which are developed having end users as building blocks are called utility based agent when there are multiplye possible alternative Then no need to decide which is best they are used.

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they choose actions based on the preference for each state. Sometimes achieving desired goal is not enough. Agent chooses action that maximizes expected utility.



5.) learning Agent :

In AI, it is type of agent that can learn from its past experiences or it has learning capabilities. It starts to act with basic knowledge & then is able to act and adopt automatically through learning.

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1.) Learning Element :

It is responsible for making the improvement by learning from env.

2.) Critic :

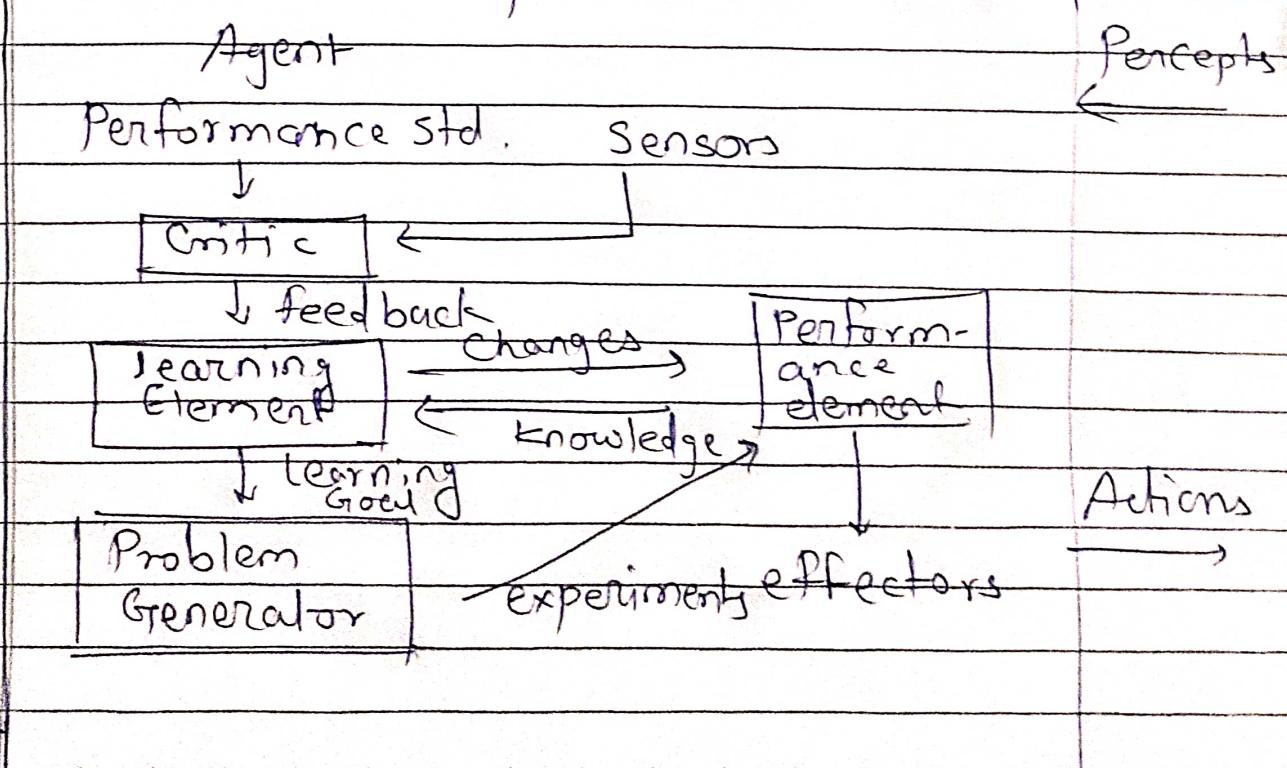
It takes feedback from critics which describes to how well agent is doing with respect to fixed performance added.

3.) Performance Element :

It is responsible for selecting external actions.

4.) Problem Generator :

It is responsible for suggesting actions that will lead to new & informative experiences.



Conclusion:

We studied all AI agent along with diagrams examples as well as understood conceptual components of all types of agents.