CT-1

AI - Unit-1

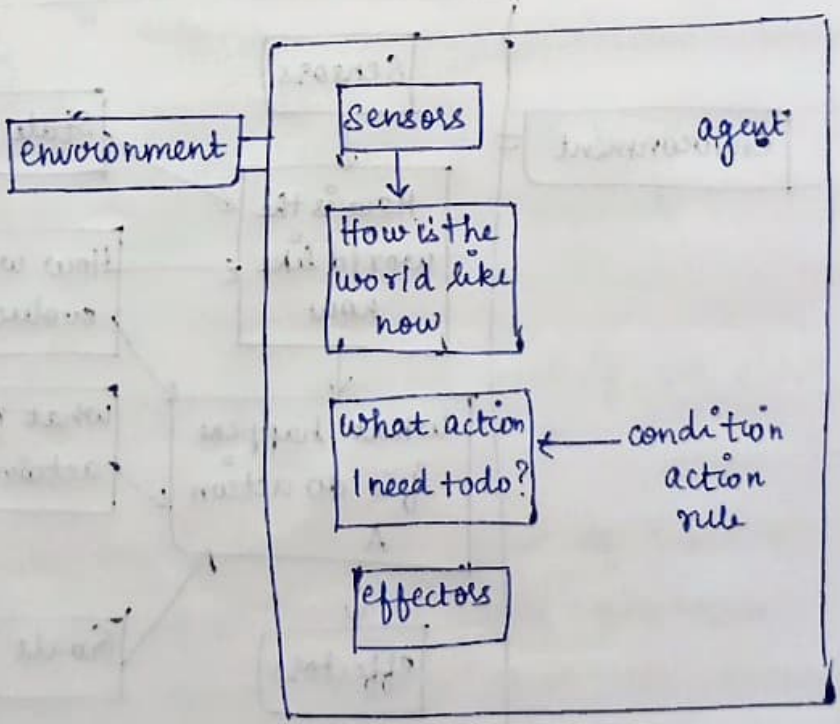
Part-C

② with suitable diagrams explain about types of agents.

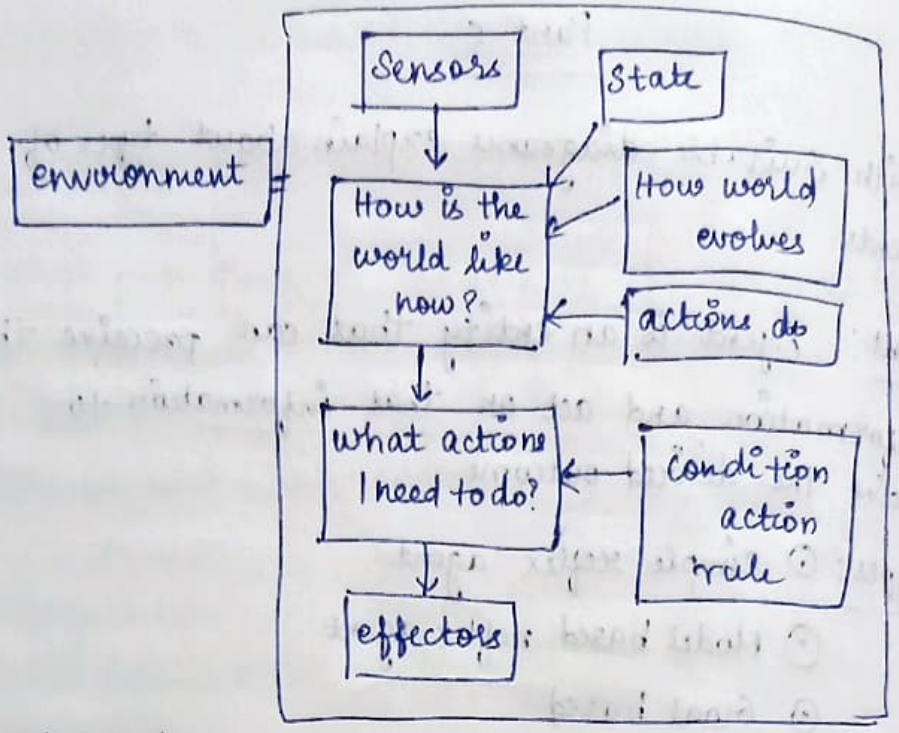
Agent: Agent is an entity that can preceive the information and act on that information to acheive the desired outcome

Types:
- ⊙ simple reflex agent
- ⊙ Model based reflex agent
- ⊙ Goal based
- ⊙ Utility based

Simple reflex: based on condition - action rule.
If condition is true the action take place, else not.

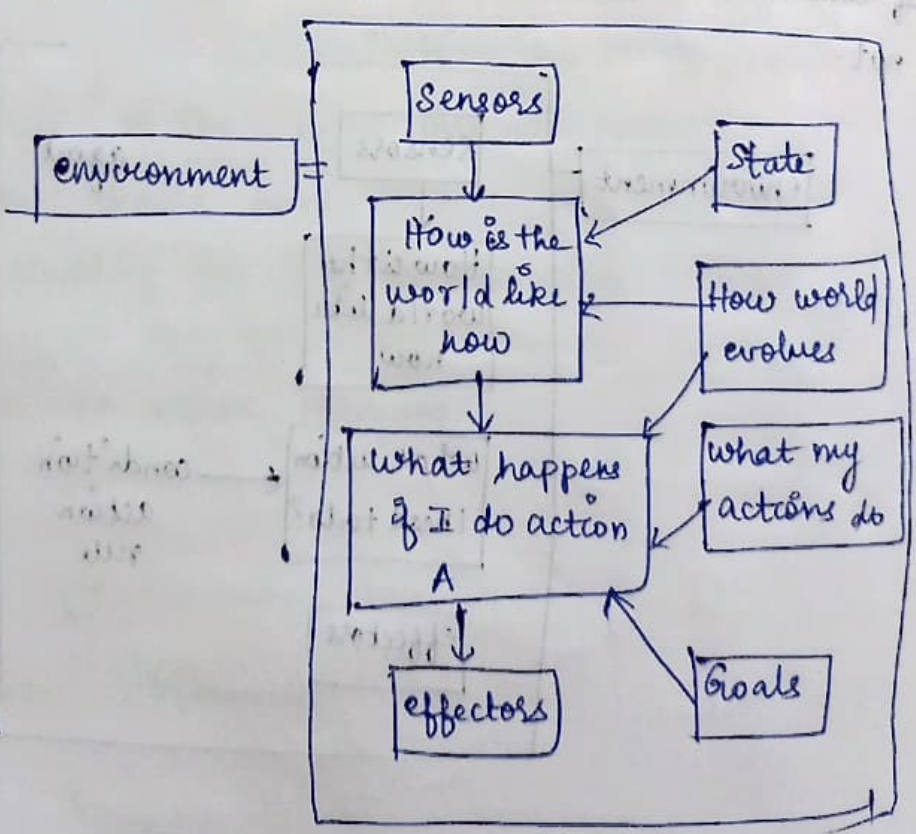


Model based reflex: works by finding a rule whose condition matches the current situation



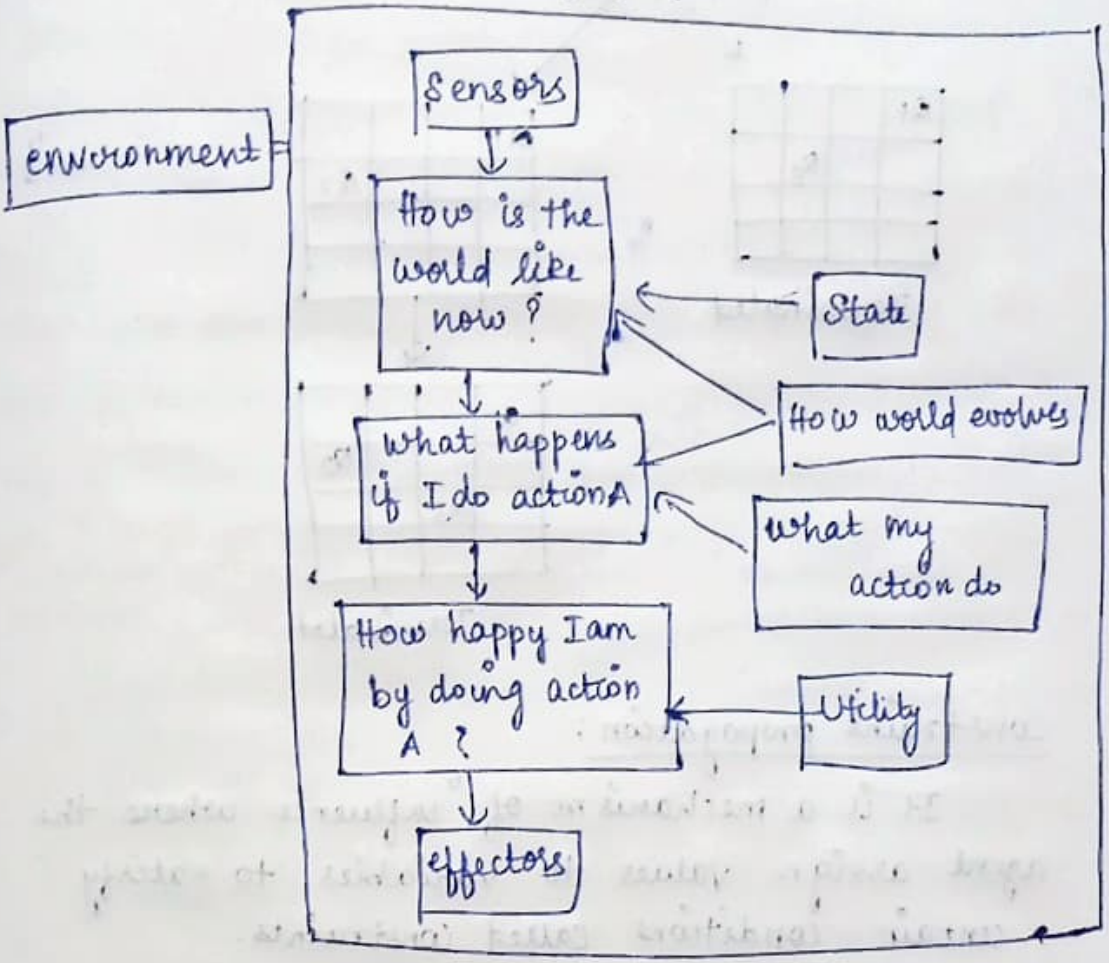
Goal based agents:

Takes decision based on how far they are currently from their goal.



Utility based agents:

The agents which are developed having their end users as building blocks.

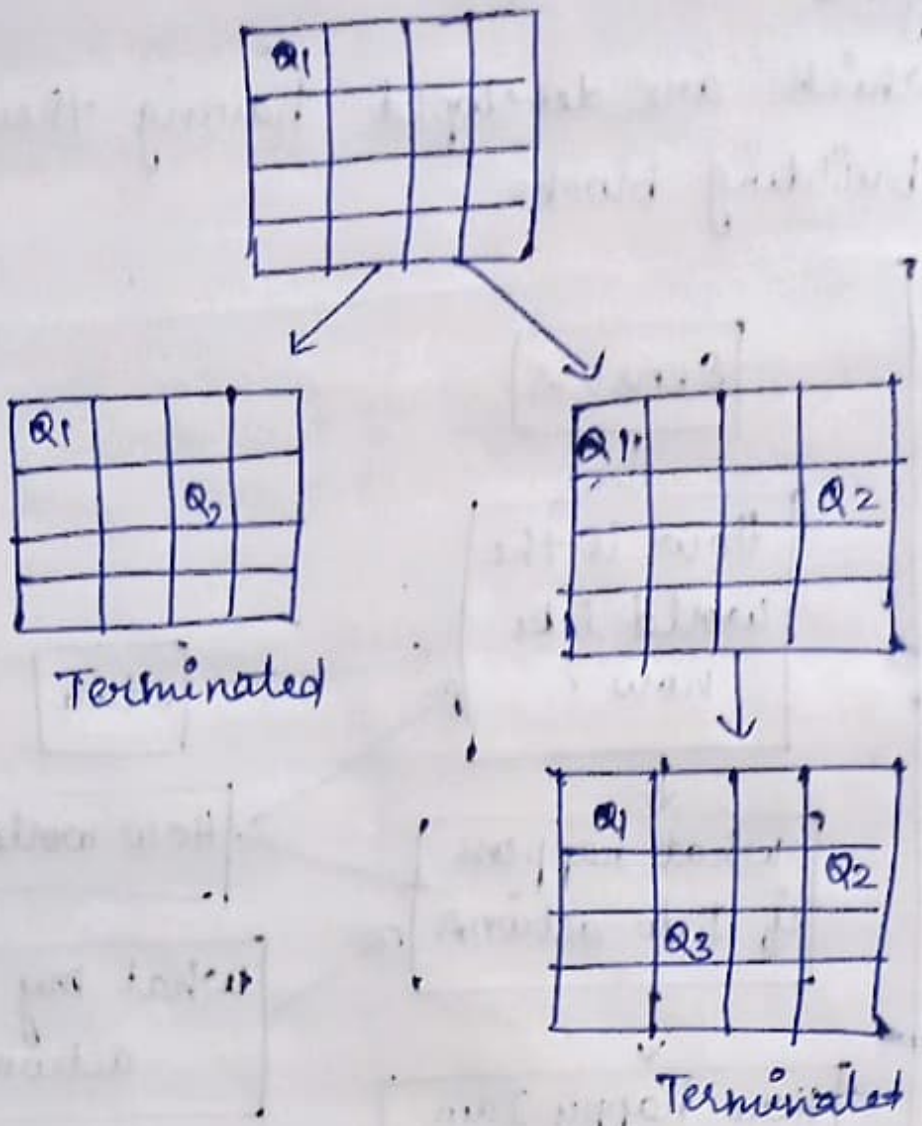


(3) Discuss the forward checking and constraint propogation technique with an example

Forward checking:

→ To understand the forward checking, we shall see 4 queens problem.

→ If an arrangement on the board of queen X, hampers the position of queen X+1, then this forward check ensures that the queen X should not be placed at the selected position and a new position is to be looked upon



constraint propogation:

It is a mechanism of influence where the agent assign values to variables to satisfy certain conditions called constraints.

⑤ Describe the problem formulation step with example

First step:

Identification of problem in problem solving process. (A problem statement can have description of data, method, procedure & algorithm that are used to solve it).

Step 2:

The next step is analysis & representation of the task knowledge.

This is done using state space diagram.

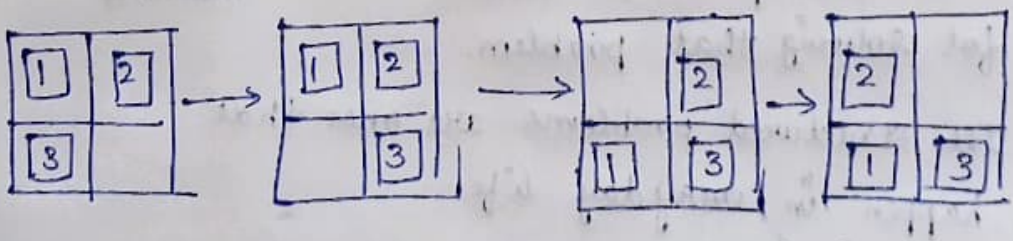
This approach is also called state space method.

↓ what is to be solved

Problem identification & definition → Problem space → Task Knowledge → State Space

→ what conditions → what is the specification of achievable objective?

Eg: State space puzzle



Part-B

(1) Describe various AI models:

Supervised, unsupervised, semi supervised, reinforcement.

(labelled), (unlabelled), (partially) (ranking based)

(2) List milestones in AI evolution

→ Machine learning

→ NLP (Natural Language problem)
(giving computers the ability to understand text & spoken words in much the same way as humans)

→ Automation & Robotics

→ Machine vision

(3) What are the statistical models?

→ Statistical model is nothing but applying mathematical approaches in dataset.

→ Here Training and Testing only done.

→ They include graphs, curves, shapes.

→ Most efficient way.

(4) Give example of one ill structured problem with description & elaborate the method for solving that problem.

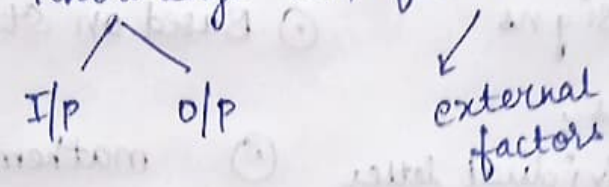
Ill structured problems are ones that happen in everyday life.

They do not yield a particular answer.

Eg: predicting how to dispose wet waste safely (explain)

⑤ Explain the model building concept in AI

Basically AI models have two main elements : Knowledge and feed back.



Knowledge based :

-) inductive: based on general rules from datasets of i/p, o/p pairs.
-) deductive: based on series of rules & infers new rules that are more efficient in the context of AI.

Feed back based : Supervised, unsupervised, semisupervised, reinforcement.

⑥ List various Equipments in day to day life where AI is used.

→ voice assistants
→ smart watches / gadgets
→ Autonomous vehicles
→ ~~Imagine~~ Image recognisation
→ Fraud detection

(7) Diff between semiotic model and statistical model.

Semiotic	Statistical
⊙ Based on sign process & communication	⊙ Based on relationship & statistical techniques
⊙ classify signs	⊙ Based on statistics.
⊙ Uses codes, Sounds individual letter	⊙ mathematical data
⊙ Logical approach	⊙ decision making

(8) can forward checking & backjumping go together for a same problem?

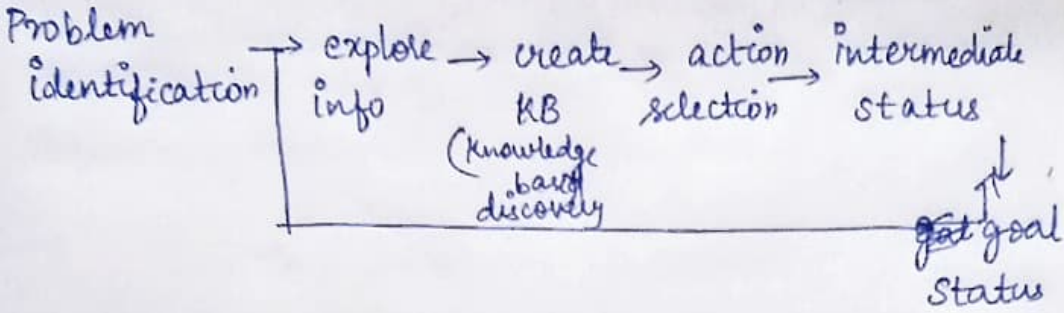
→ conflict set is maintained using forward checking & maintained

→ considering the 4 queens problem, conflict needs to be detected by the user of conflit set so that a backtrack can occur

→ Backtracking with respect to the conflict set is called as conflict - directed backjumping

→ Back jumping approach can't actually restrict the earlier committed mistakes in some other branches.

(9) Explain about problem solving process with neat diagram.



(10) Discuss the local search in CSP with examples

→ Initial state :

- {} - all variables are unassigned

→ Successor fn:

a value is assigned to one of the unassigned variables with no conflict

→ Goal test:

a complete assignment

→ path cost:

a constant cost for each step

→ solution appears at depth n if there are n variables.