

2) Importance of Turing machine:-

If the machine behavior cannot be differentiated from that of an intelligent human it must be conceded that the machine possesses the same faculty as the human.

3) Performance measures:-

	Time	space
Breadth FS	$O(b^d)$	b^d
Depth first search	$O(b^m)$	b^m
uniform cost	$O(b^d)$	b^d

4) Action rationally means acting to achieve one's goal one's beliefs (or) understanding about the world. An agent is a system that perceives and environment and acts within the environment

5) Informed

uninformed

→ It finds soln more quickly

→ cost is low

→ It consumes less time

→ code implementation is less

→ It ~~can~~ finds soln slow when compared to informed search

→ cost is high

→ It contains more time when compare to Informed search

→ code implementation is length.

6) Architecture :- Architecture is making of an AI agent executes on

Agent function :- Agent function is used to map a percept to an action

Agent program :- Agent program is

an implementation of agent function

7) Consistent heuristic:-

A heuristic is consistent if the cost from the current node to a successor node, ~~to~~ the estimated cost from the successor node to the goal is less than or equal to ~~estimated~~ cost from the current node to goal.

Admissible heuristic:-

A heuristic is admissible if the estimated cost is never more than the actual cost from the current node to the goal node.

8) Automated car driver :- Performance measure
Safety : Automated system should be able to drive the car safely without hitting anywhere.

Optimum speed : Automated car should be able to maintain the optimal speed depend on surroundings.

9) An environment is static if only the actions of an agent modify it.

eg 1:- physical world

Dynamic :-

It is dynamic on the other hand if other processes are operating on it

eg :-

empty ground with no audience

① According to my opinion, low skilled and manual workers will be replaced by AI automation. Employers are generally looking at AI as a method of ~~arg~~ augmenting human workers and enabling them to work in newer smarter way.

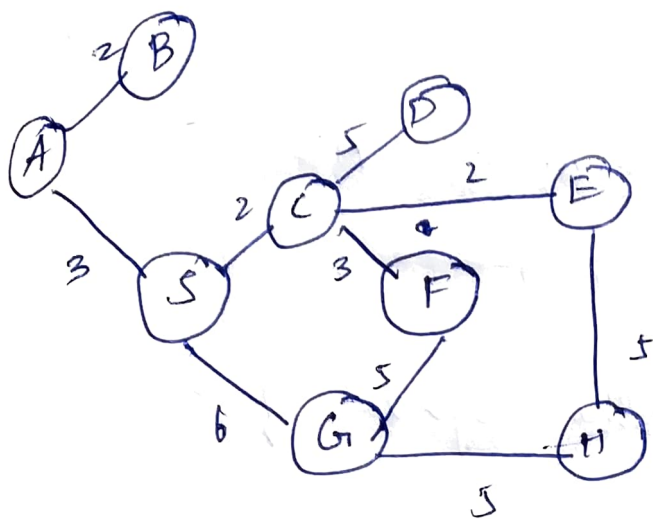
⇒

Performance measure	} →	Safe, fast, legal comfortable.
Environment	→	roads, other traffic pedestrians.
Actuators	→	steering wheel, accelerator, brake
sensors	→	Cameras, sonar, GPS, Odometer, keyboard

DPA
Algorithm :-

Part - B

- * Define a stack of size total no. of vertices in graph
- * Select any vertex as starting point for traversal, visit the vertex and push it on to the stack.
- * Visit any one of the adjacent vertex of the vertex which is at the top of the stack, which is not visited, and push it on to the stack.
- * Repeat 3 until there are no new vertices to be visit from the vertex on top of the stack
- * When there is no new vertex to be visit then use backtracking and pop one vertex from the stack.
- * Repeat step 3, 4, 5 until stack becomes empty
- * When stack becomes empty, then produce final spanning tree by removing unused edge from the graph



Selecting A as starting point.



Output - A

Set S from adjacent of A



Output - A B

pop B and push S

Set C from adjacent from S.



Output \rightarrow A B S C

Set D from adjacent from C



Output \rightarrow A B S C

Since D has no adjacent we have to pop out D

C
S
A

output :- ABSCD.

Set E which is the adjacent of C

E
C
S
A

output :- ABCDE

Set H which is the adjacent of E

H
E
C
S
A

output :- ABCDEH

Set G which is the adjacent of H

G
H
E
C
S
A

output :- ABCDEHG

Set F which is the adjacent of G

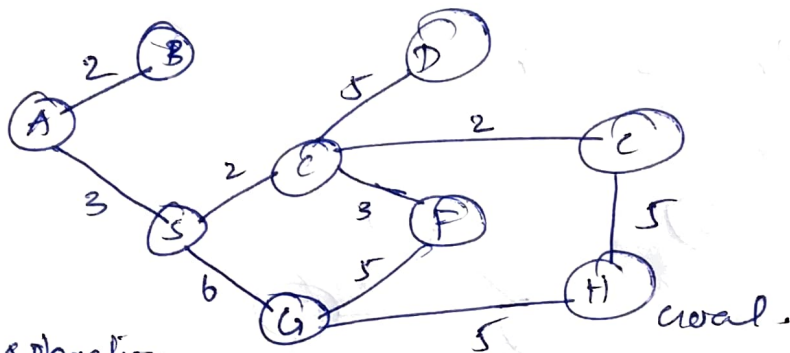
F
G
H
E
C
S
A

output :-

ABSCDEHGF

Since all nodes are visited pop all node and stack becomes empty

BFS



Algo & explanation

Step-1 :-

First let us A as starting Node.

so add A to output $\rightarrow A$.

Step-2 :-

Adding adjacent q_A in the queue.

Then.

queue :-

B

output $\rightarrow AB$.

Step-3 :-

Adding another adjacent q_A is S

B S

output $\rightarrow ABS$.

Step-4 :-

Now deque B

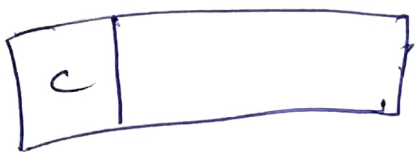
Since it has no adjacent

BS	
----	--

output $\rightarrow ABS$

Step-5 :-

now deque s and add adjacent of s in the queue



output : ABSC

Step-6 :-

Add adjacent of s if is G



output : ABSCG

Step-7 :-

deque c and add adjacent of c.



output : ABSCGDEF

Step-8 :-

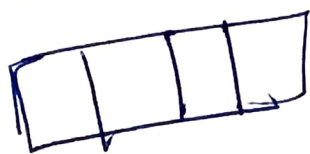
deque G and adjacent of G



output : ABSCGDEFH

Step-9 :-

deque D and find the element which is unvisited. then



output : ABSCGDEFH

10) Agent Types :-

~~Four types of agents~~

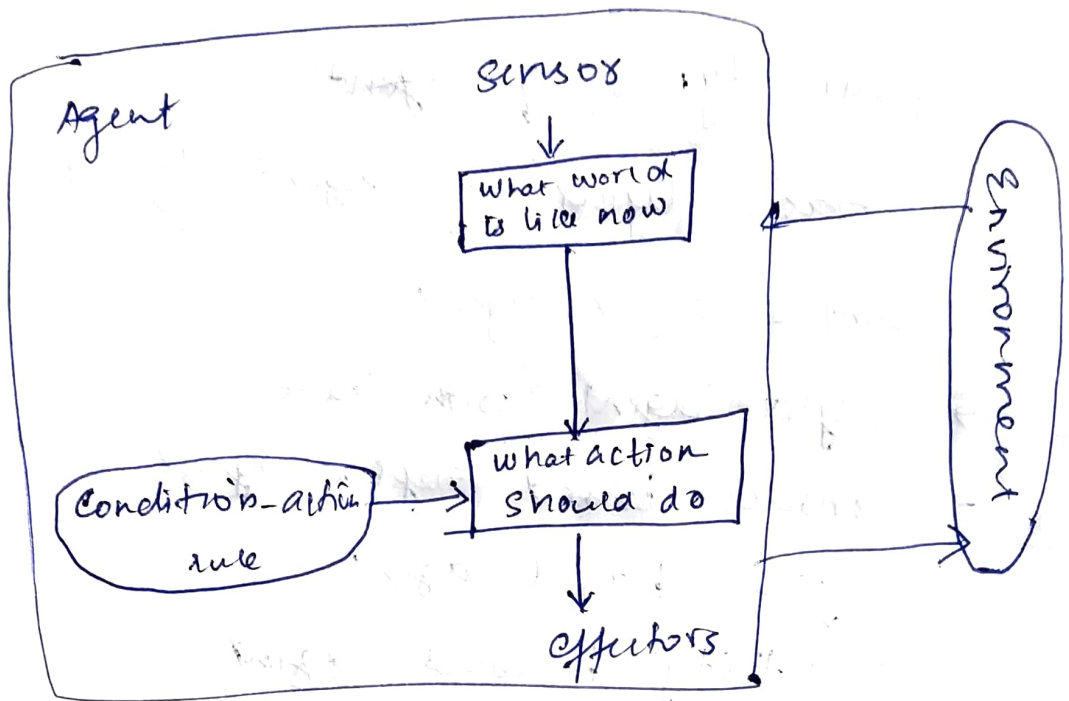
Basic types of agent types

- Simple reflex agent
- reflex agent with state.
- model based reflex agent
- goal-based agent
- utility based agent
- learning agents.

Simple - reflex agent :-

Simple - reflex agents select actions on the basis of the current percept, ignoring the rest of the percept history. Based on condition-action rule, they are simple but turn out to be of very limited intelligence. The agent will work only if the correct decision can be made on the basis of the current percept.

Simple reflex agent:



Reflex Agent with state:

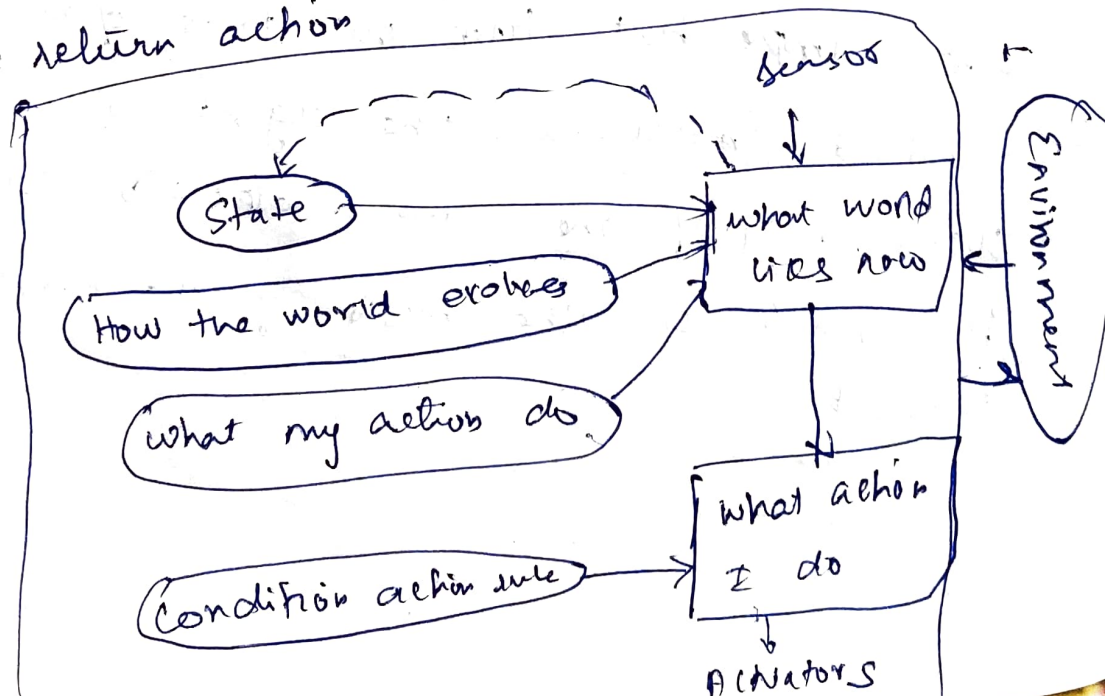
Store previously-observed information

State = UpdateData (state, action, percept)

rule = Rule Match (state, rules)

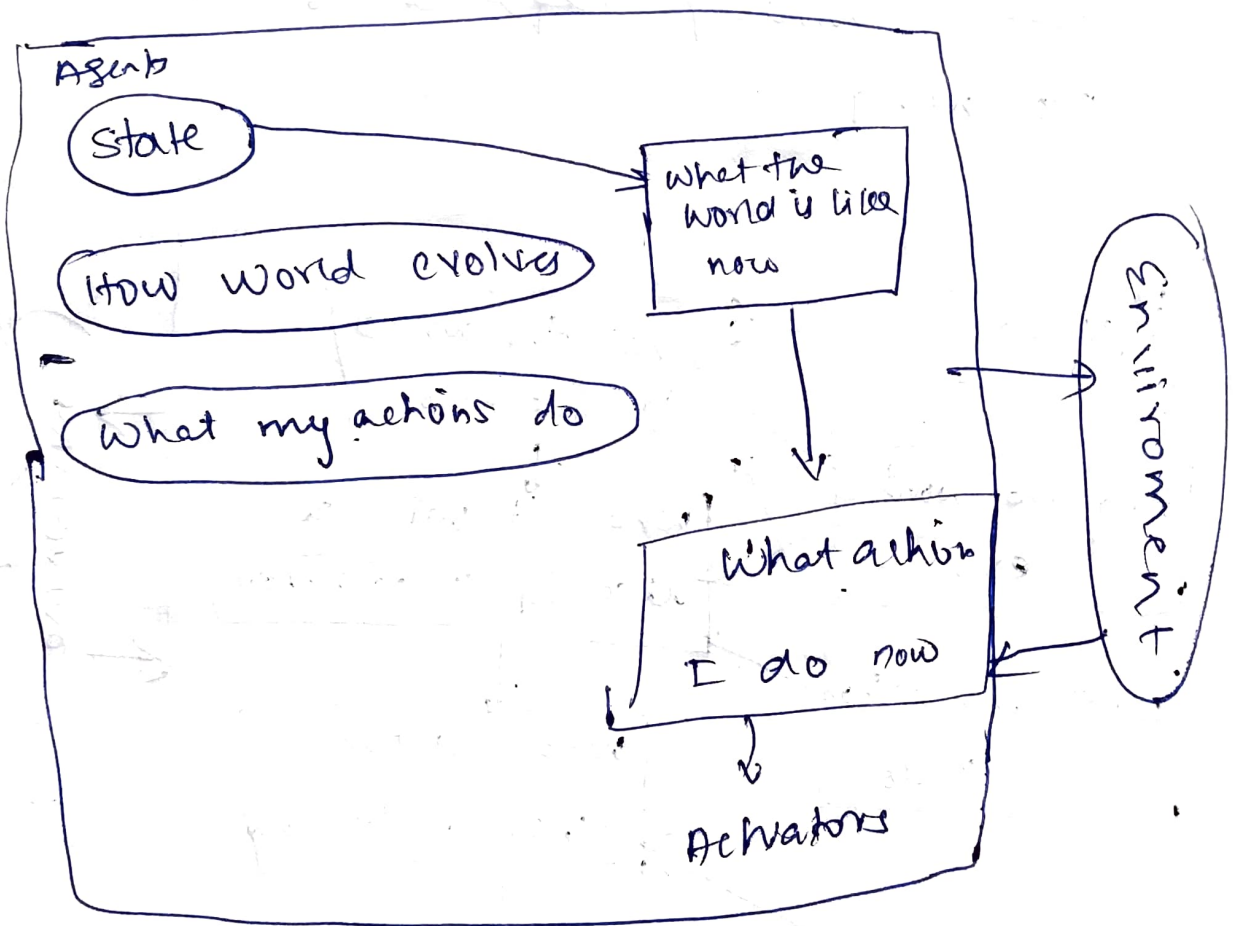
action = RuleAction (rule)

return action



Model-based reflex agents

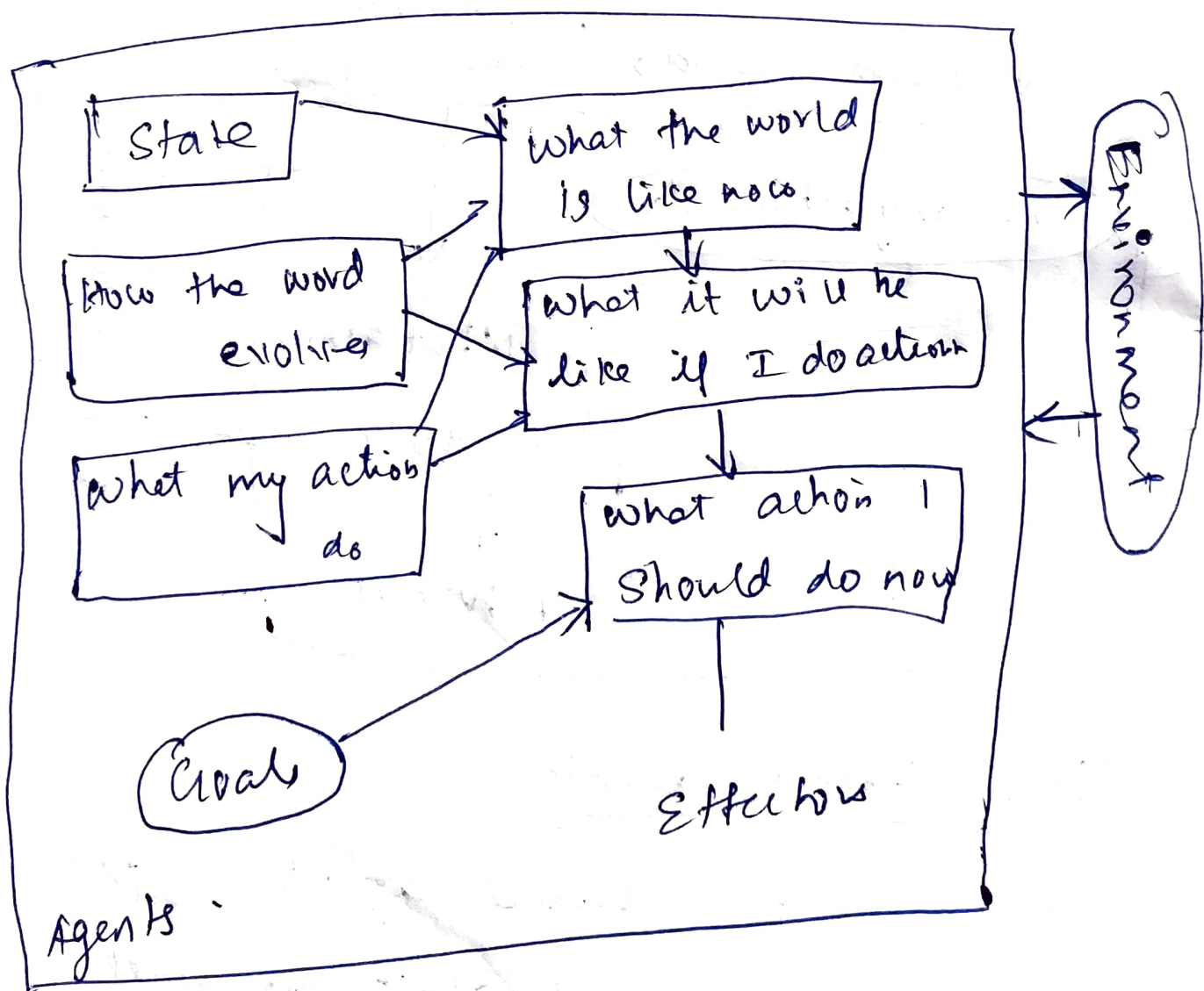
A model-based reflex agent keeps track of the current state of the world. It chooses an action in the same way as the reflex agent. It works by finding a rule whose condition matches the current situation.



Goal based agents :-

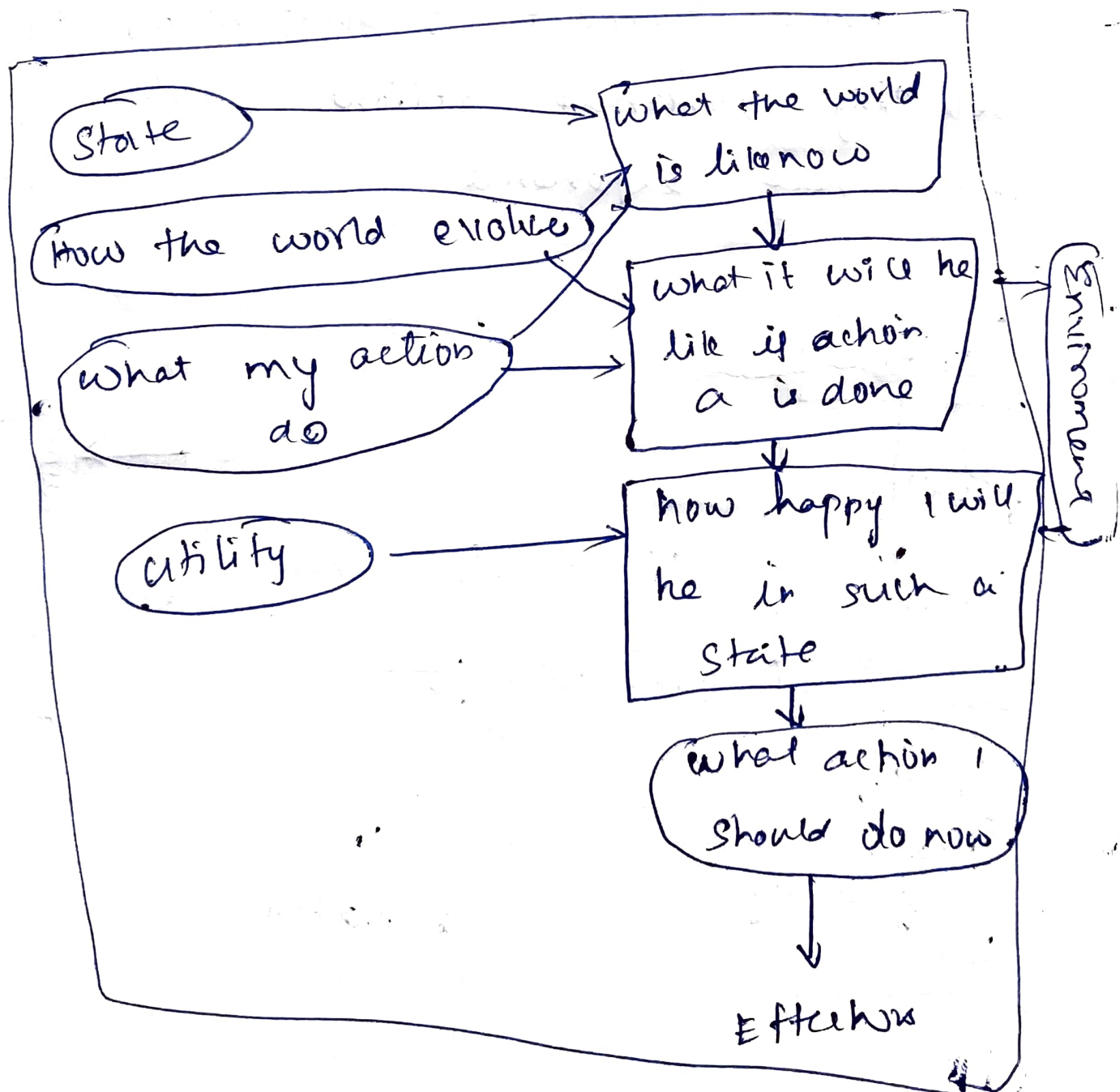
A goal based agent keeps track of the world state as well as a set of goals it is trying to

achieve and choose an action that will lead to ~~an~~ achievement of the goals. Many action choices choose the goal action. ~~The informed~~ the information about the results of possible actions in order to choose action that achieve the goal. usually requires search and planning.



Utility based agents:-

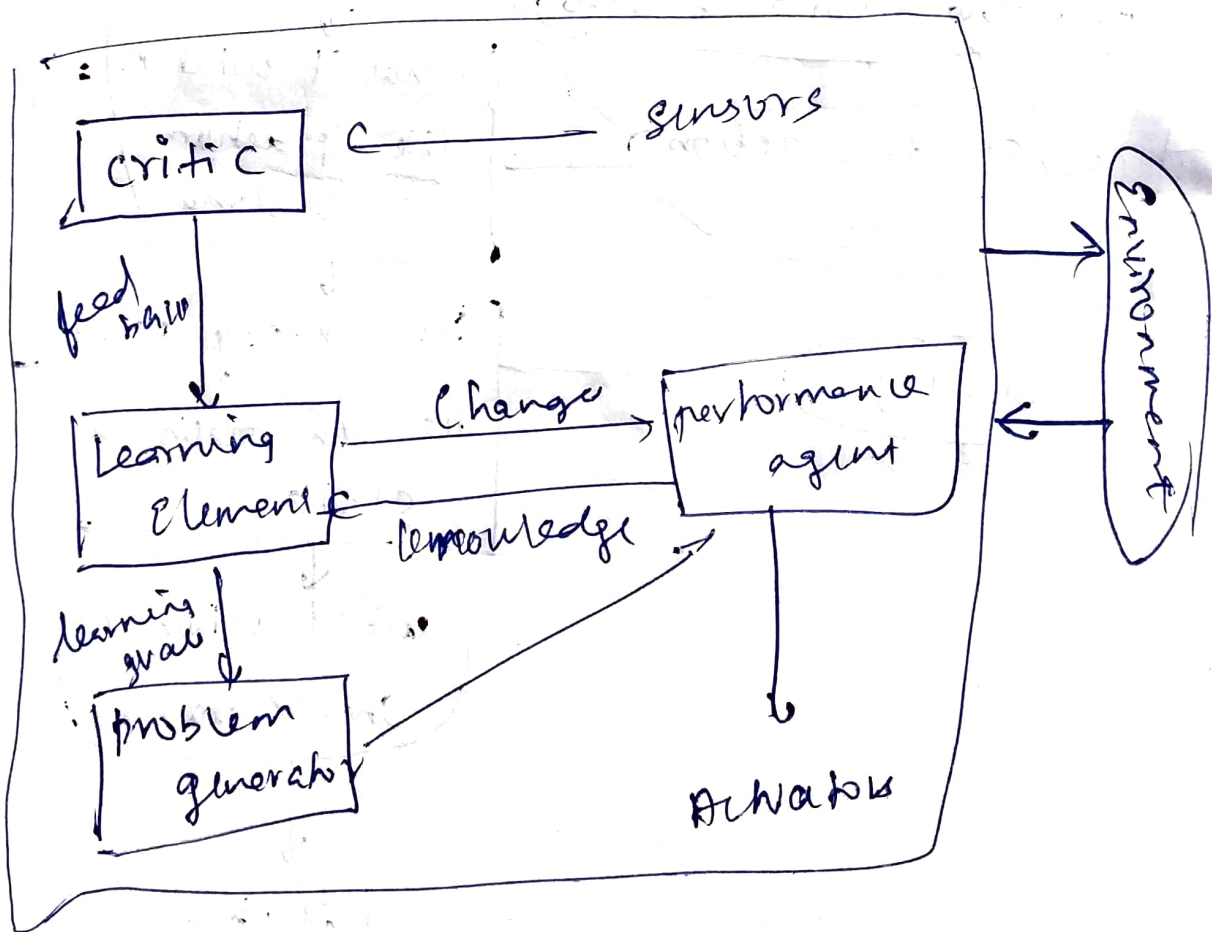
A utility based agent uses a model of the world, along with a utility function that measures its preference among the state of the world. It chooses the action that leads to the best expected utility.



learning agent:-

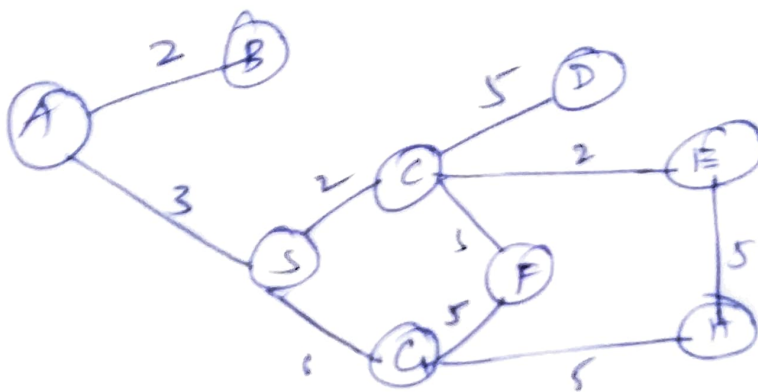
- learning agent initially learn in new environment and then becomes competent then the initial knowledge. Initial knowledge fed through learning methods through Machine learning algorithm.
~~And~~ learns through experience.

Performance Element is responsible for selecting external actions and learning from new experience.



Part-B

VFS :-



Aim :-

to traverse from the start state to reach the goal state.

Initial state = A

goal state = H



Visited :- A, B, S, C, E, F, G, D

There are 2 ways to reach goal state

$A \rightarrow S \rightarrow G \rightarrow H$ (14)

$A \rightarrow S \rightarrow C \rightarrow E \rightarrow H$ (12)

according to UCS optimal solution

$A \rightarrow S \rightarrow C \rightarrow E \rightarrow H \Rightarrow$ output