K.G.C.E.
Karjat - Raigad

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Name :- Rohan Shrichhar Bhavsar

Class :- BE

Dept :- IT

Batch :- I1

Roll No :- 08

Sub :- AI.

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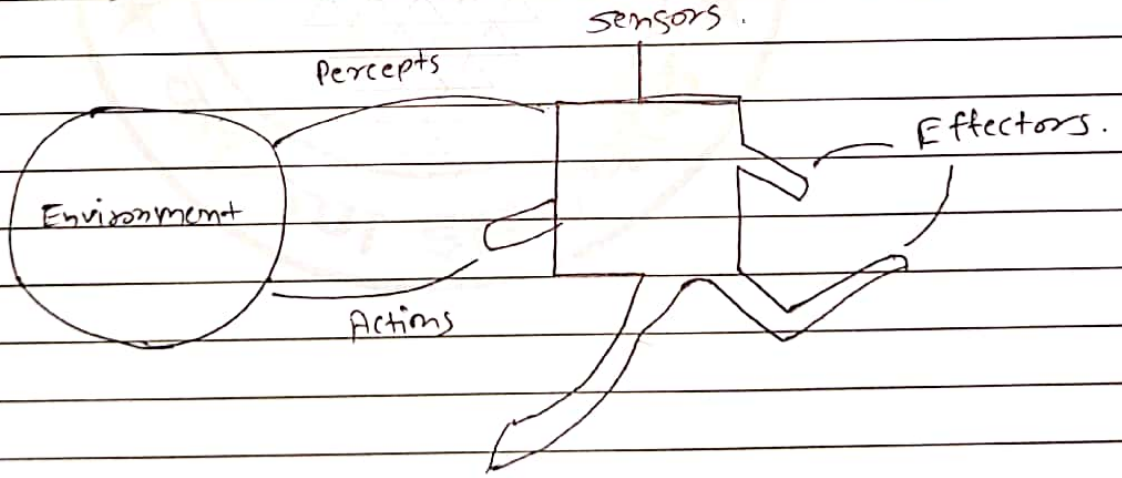
Design of Intelligent Agent.

Aim:- To understand the concept of Agent Abstracted by studying definition of Rational Agent, Agent environment Task Environment Descriptions, environment types.

Theory:

An Artificial Intelligent (AI) system is composed of an agent and its environment The agents act in their environment An agent is anything that can perceive its environment through sensors. and acts upon that environment through effectors.



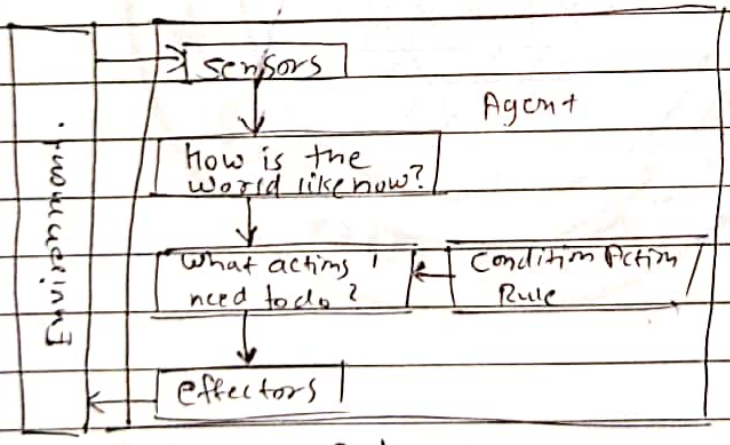
AI Agent with Environment

Human agent:- has sensory organs such as eyes, ears, nose, tongue and skin parallel to the sensors, and other organs such as hands, legs, mouth, for effectors.

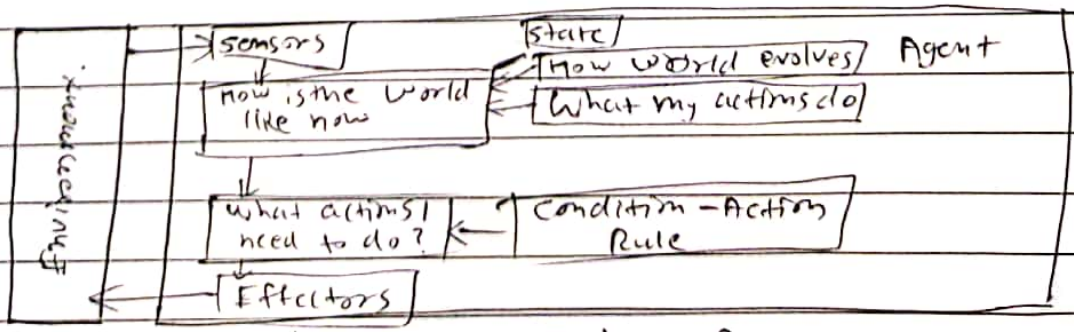
Robotic agent replaces cameras and infrared range finders for the sensors and various motors and actuators for effectors

Software agent: has encoded bit strings as its programs and actions.

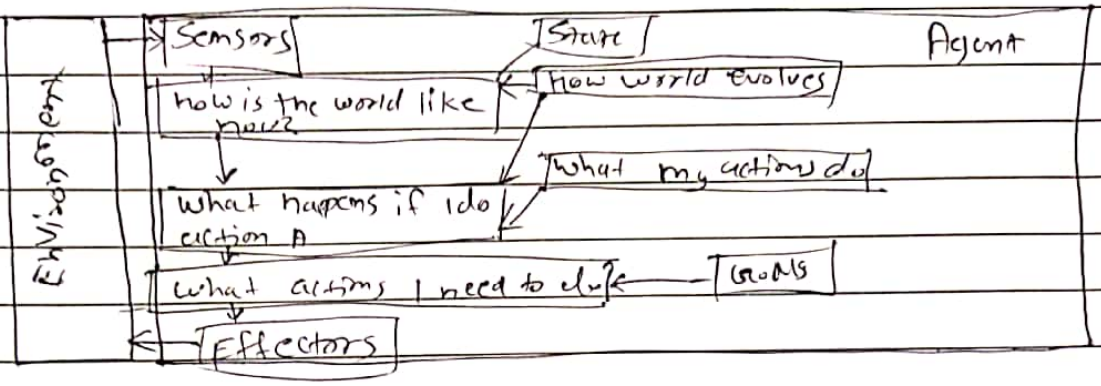
Agent Structure can be vieved as a combination of Agent architecture and Agent program, Agent Architecture refers to the machinery that an agent executes on whereas Agent program is an implementation of agent function.



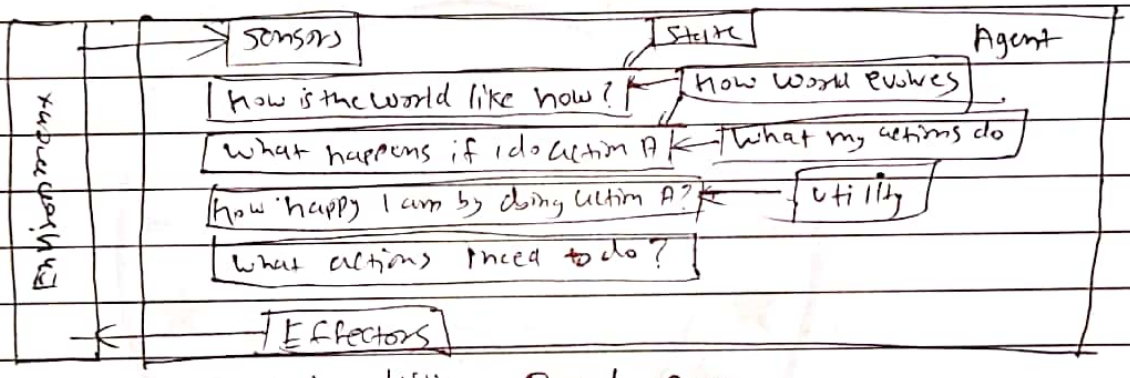
(a) Simple Reflex Agent



(b) Model Based Reflex Agent.



(c) Goal Based Agent.



(d) Utility Based Agent.

Agent Architecture Types

An AI agent is referred to as Rational Agent. A rational agent always performs right action where the right action means the action that causes the agent to be most successful in the given percept sequence. The problem the agent solves is characterized by performance measure, Environment, Actuators and Sensors (PEAS).

Another important piece of information is task environment properties while analyzing task environment the agent architect needs to consider following properties.

1. Discrete or Continuous If there are a limited number of distinct clerly defined states of environment the environment is discrete.

2. Observable or Partially Observable If it is possible to determine the complete state of the environment at each time point from the percepts it is observable.

3. Static or Dynamic If the environment does not change while an agent is acting then it is static. Otherwise it is dynamic.

5. Deterministic or Non-deterministic If the next state of the environment is completely determined by the current state and the actions of the agent

5. Episodic or Sequential In an episodic environment, each episode of events consists of the agent perceiving and then acting

6. Single agent or Multiple agents the environment may contain single agent or other agents which may be of the same kind as that of the agent.

7. Accessible or Inaccessible If the agent's sensory apparatus can have access to the complete state of the environment then the environment is accessible to that agent.

Working: Search internet for AI based applications in following scenarios and identify who is agent for that application.

1. Autonomous Lunar Rover.
2. Deep Blue Chess playing computer program.
3. Eliza the natural language processing computer created
4. Automatic portfolio management.
5. Sophia is a Social humanoid developed.
6. AlphaGo is a Computer program that plays the board game Go.
7. Apple's virual assistance Siri
8. Endurance
9. CASPER
10. marvel
11. Automated Cross word solver.

Resources The above diagrams are taken from online tutorial available at tutorials. points on topic AI - agents and environments.