

Mid Examination - Spring 2023

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CSE - 21st Batch

Artificial Intelligence

Course code: CS1-341

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Ans. to the Q. no-1

(a)

* Artificial Intelligence :-

Artificial Intelligence is the simulation of process human intelligence process by machines, especially computer systems.

* Application of AI :-

- ① Astronomy
- ② Healthcare
- ③ Gaming
- ④ Finance
- ⑤ Data Security
- ⑥ Social Media
- ⑦ Travel and Transport
- ⑧ Automotive industry
- ⑨ Robotics
- ⑩ Entertainment
- ⑪ Agriculture
- ⑫ E-commerce
- ⑬ Education

5)

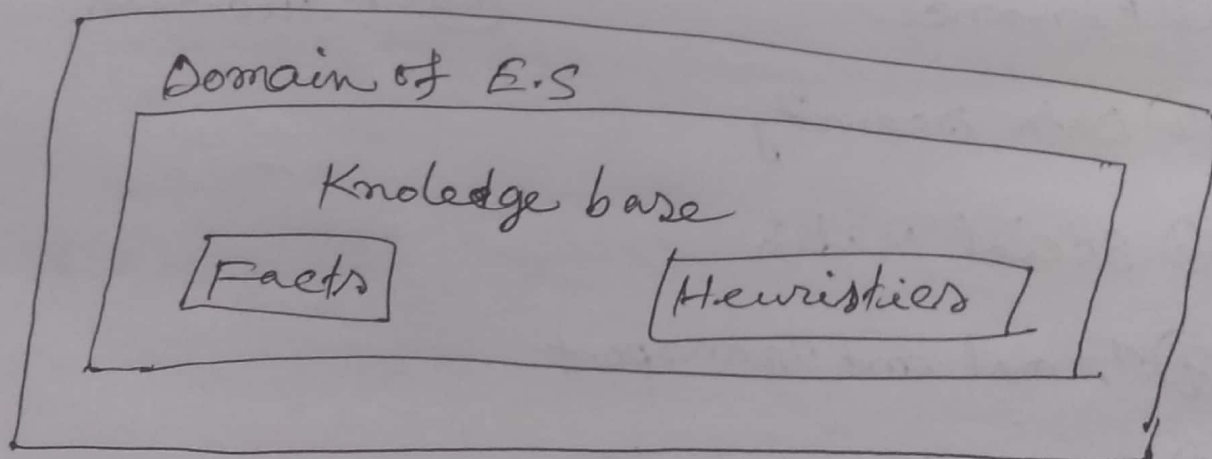
* Natural Language processing (NLP) :-

NLP helps computers to communicate with humans in their own language and solves other language related tasks.

For example - NLP makes it possible for computers to read text, hear speech, interpret it, measure sentiment and determine which parts are important.

* NLP Expert system :-

An expert system is a computer program designed to act as an expert in a particular domain (area of expertise).



(2)

* Necessity of NPL in Expert System :-

Expert system currently are ~~designed~~ designed to ~~expand~~ assist experts, not to replace them. They have been used in medical diagnosis, chemical analysis, geological explorations etc.

Ans. to the q. no - 2

2(a)

⇒ Different types of AI :-

① Purely Reactive :- These machines do not have any memory or data to work with, specializing in just one field of work.

② Limited Memory :- These machines collect previous data and continue adding it to their memory.

③ Theory of Mind :- This kind of AI can understand thoughts and emotions, as well as interact socially.

④ Self-Aware :- Self-aware machines are the future generation of these new technologies. They will be intelligent, sentient and conscious.

③

2(b)

* Foundation of AI :-

① Philosophy :- Logic methods of reasoning, mind as physical system foundations of learning language rationality.

② Mathematics - Formal representation and proof, algorithms, computations, (un) decidability, (in) tractability, probability.

③ Economics - utility, decision theory.

④ Neuroscience - physical substrate for mental activity.

⑤ Psychology - Phenomena of perception and motor control, experimental techniques.

⑥ Computer Engineering - Building fast computer.

⑦ Control Theory - Design systems that maximize an objective function over time.

⑧ Linguistics - knowledge representation grammar.

④

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~~2(a)~~

2(c)

An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators.

* Human Agent :- (1) Sensors (2) Actuators

① Sensors - Eyes, ears and other organs for -
Sensors.

② Actuators - Hands, legs, mouths and other body parts.

* Robotic Agent :-

① Sensors - Cameras, touch sensors and infra-red range finders.

② Actuators - various motors for actuators.

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⑤

Ans. to the Q. no-4

4(b)

Draw the block diagram and briefly describe of model-based reflex agent.

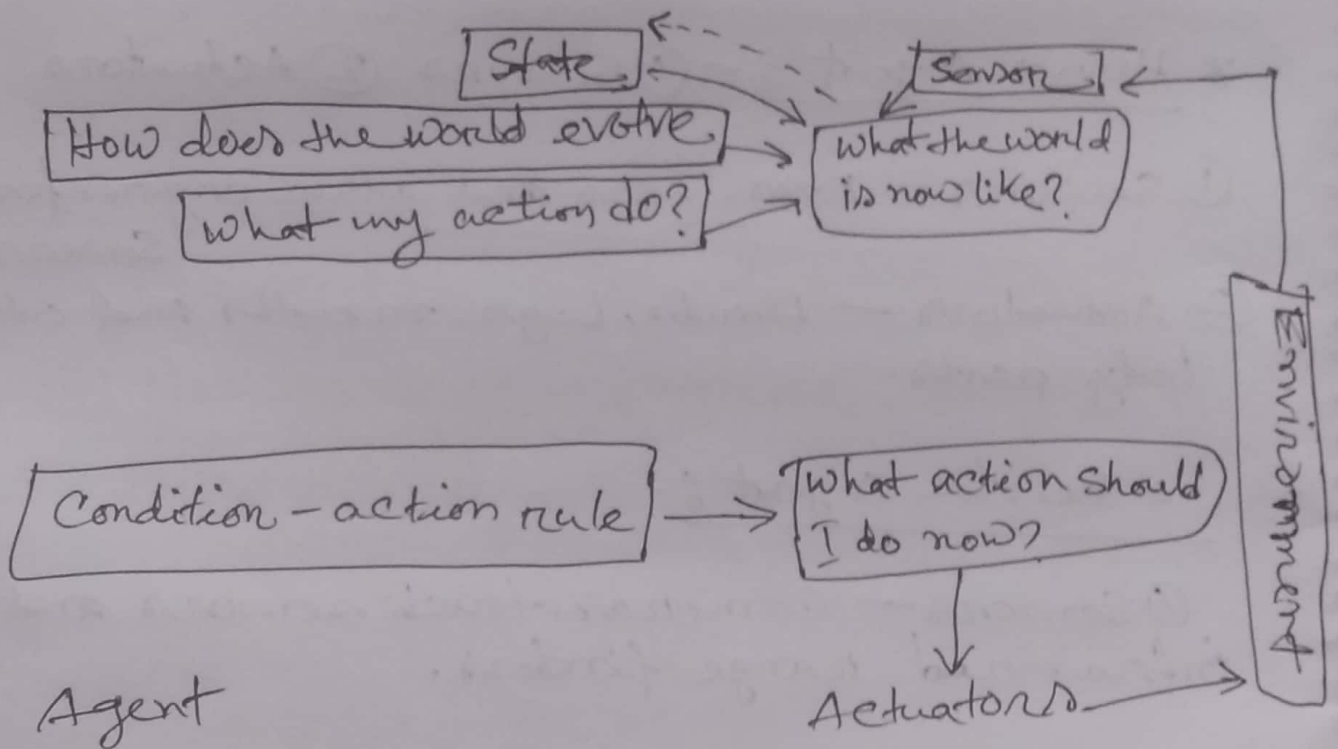


Fig: Model-based reflex agent

(b)

Function reflex-agent-with-state (perception) return an action

state: state, a description of current world.

rules, a set of condition action rules.

action, the most recent action, initially none.

state \leftarrow update-state (state, action, percept)

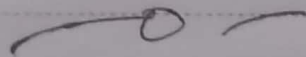
rule \leftarrow Rule-Match (state, rules)

action \leftarrow Rule-action (rule)

return action -

Knowing about the current is not always enough to decide what to do.

For example - in the junction, left, right, go straight.



(7)