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TE COMP - B
ROLL NO - 01

Subject :- IIS Experiment / Tutorial / Assignment No. :- FA - 1 Page :- 1

Q1] Describe Performance measures, environment, Actuators and Sensors for above applications.

→ 1] Factory Automation
Part picking robot is a part of it
Performance measure :- To pick up all the spare parts timely and assemble it in proper bins.
Environment :- Factory, tools, workers, conveyor belt with parts, bins
Actuators :- Jointed Arm/Hands
Sensors :- Camera, joint angle sensors

2] Medical :- A virtual doctor is a part of it
Performance measure :- Patient is satisfied, fully recovered from disease.
Environment :- Teleclinic, Room, Hospital.
Actuators :- Display screen, voice response system and captions on screen.
Sensors :- Medical devices, voice inputs from patients and attendant data entry by the local attendant.

3] Education :- Online tutor is an example of Education field.
Performance Measure :- Maximize students score on test, improve student performance.
Environment :- Classroom, Set of students.
Actuators :- Screen display
Sensors :- Keyboard

4] Education/Entertainment :- Movie recommendation system.
Performance Measure :- The user watches the movie/show recommended by the system.

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Environment :- Living room, OTT platform, History and interest of user.
Actuators :- Analyse data and recommend movies/shows to the customers.
Sensors :- Past Watch, Popular watch of all users.

2] Determine Environment characteristics of above applications

→ Factory automation :- Part Picking Robot.
a) Partially observable :- It can see environment depending on the range of camera.
b) Single Agent :- Its actions are independent of other agents.
c) Stochastic :- It can't determine based on its actions.
d) Discrete :- If actions depends on number of posts.
e) Episodic :- Its next action doesn't depend on its previous one.

Medical :- Surgical Robots.
a) Partially observable :- It can observe environment based on surgery.
b) Multi-Agent :- It performs multi-task at a time.
c) Deterministic :- It can determine the result based on its actions.
d) Continous :- We can't count the actions required in surgery.
e) Sequential :- Its future actions depends on its percept history.

Education :- Online Tutor.
a) Partially observable :- Can see only the range of camera.
b) Multi-agent :- Its use depends on other agent.
c) Stochastic :- It can't determine what happens next.
d) Sequential :- It can perform series of action
e) Discrete :- Its actions are countable.

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4] Entertainment :- Poko.

a) Partially observable :- We can't observe whole environment.

b) Multi- Agent :- Multiple players can play the game.

c) Stochastic :- We can't determine what would happen next.

d) Sequential :- Actions depends on decision taken in past.

e) Discrete :- We can finish the game in numberical action.

Q3] Identify and justify category of Intelligent System.

→ 1) Factory Automation is a category of bodily Kinesthetic intelligence. it robusts heads to use their arms, hands and dismantle parts of their system to complete the task.

2) Medical falls in the category of linguistic intelligent system as to virtual doctor system nents to interact with the patients is their regional language and understand their concern.

3) Education falls in linguistic Intelligent as interactive english tutor needs to Know English and be able to speak in English to teach students

4) Entertainment falls into interpersonal intelligence system to determine/recommend movies/shows based on customers feelings and intentions which helps the system to be effective.

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Q4] For each of the applications, relate which type of agent architecture is most appropriate.

→ 1) Factory automation :- Utility based agent architecture is used and most appropriate as companies needs the robots to complete the task timely and effectively.

2) Medical :- Goal based agent is most appropriate as we need to ensure that the surgery is performed with good results.

3) Education :- Goal based agent is most appropriate as the goals met the student should score more marks in the exam.

4) Entertainment :- Utility based architecture is most appropriate as we can suggest movies/shows to the user which his/she stream with the least amount of the data possible or available.

Q5] Outline the problem formulation for each of the above application w.r.t any task related to application.

→ 1) Problem Formulation for Part-Picking Robot

Initial state :- Robot is currently free from work.

Actions :- Picks the part, assemble the part in correct bin.

Goal state :- Successfully picks the part and assemble properly in bins.

Path cost :- 1 actions per move.

2) Medical diagonose robot :-

Initial state :- Robots is ready to take patients history.

Actions :- Picks the surgery tools, perform surgery and drop the tool.

Path cost :- 1 cost per action.

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3) Educational chatbot :-

Initial state :- Wait for students questions / doubts.
Actions :- To give response to questions / doubts asked.
Goal state :- To make students satisfied with the response.
Path cost :- 1 cost per action.

4) 8 Puzzle Game :-

Initial State :- 8 puzzle provided to use to achieve the goal.
Actions :- Move a blank tile up, left, right, bottom.
Goal state :- To reach the 8 puzzle pattern needed.
Path cost :- 1 cost per action.

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