Victoria University
of Bangladesh

MID Term Assessment

Md Bakhtiar Chowdhury

ID: 2121210061

Department: CSE

Semester: Spring -2023

Batch: 21th

Course Title: Artificial Intelligence

Course Code: CSI 341

Submitted To:

Md. Shahin Khan

Lecturer, Dept. of CSE/CSIT

Victoria University of Bangladesh

Submission Date: 19 April, 2023

Answer to the question no 1(a)

Answer to the question No 1(a)

1. a) Answer:- Define AI

AI is a branch of computer science that studies the computational requirements for tasks such as perception, reasoning and learning and develop systems to perform those tasks.

⇒ To respond to situations very flexably.

⇒ to make sense out of ambiguous or contradictory message

⇒ to recognize relative importance of different elements of situation

⇒ To find similarities between situations despite difference.

Application of AI

- Expert systems.
- Natural language processing (NLP)
- speech recognition.
- computer vision.
- Robotics
- Automatic programming.
- virtual assistants
- E-commerce
- Health-care

Answer to the question NO 1(b)

1. b) Answer:-

NLP:- NLP stands for Natural Language processing, which is a subfield of artificial intelligence (AI) and computational linguistics that focuses on the interaction between computers and human language

Example:- Smart Assistants, predictive text, Language translation chat bot

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

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

Answer to the question 2(a)

2. a) Answer:-

Different types of AI

\# modeling exactly how human actually think

    — cognitive models of human reasoning

\# modeling exactly how humans actually act.

    — models of human behavior (what they do, not how they think)

\# modeling how ideal agents "should think"

    — model of "rational" thought (formal logic)

    Note: humans are often not rational.

\# modeling how ideal agents "should act"

    — rational actions but not necessarily formal rational reasoning

    ie, more of ~~back~~ black-box/engineering approach

\# modern AI Focuses on the last definition

    — we will also focus on this "engineering" approach

    — success is judged by how well the agent performs.

    — modern methods are also inspired by cognitive & neuroscience (how people think)

<u>Answer to the question No 2(b)</u>

2.b) Answer:-

List of Foundation of AI

\# <u>Philosophy</u> - Logic, methods of reasoning, mind as physical system ~~fundational~~ foundations of learning, Language, rationality.

\# <u>Mathematics</u> - Formal representation and proof, algorithms, computation, (un)decidability, (in) tractability, probability.

\# <u>Economics</u> - ~~uliti~~ utility, decision theory.

\# <u>Neuroscience</u> - physical substrate for mental activity.

\# <u>psychology</u> - phenomena of perception and motor control, experimental techniques.

\# <u>computer engineering</u> - building fast computers

\# <u>controll theory</u> - Design system that maximize an objective function over time.

\# <u>Languistics</u> - knowledge representation grammar

\# <u>Statistics and machine learning</u> = AI realies heavily on statistical methods and machine learning algorithms.

Answer to the question NO 2(c)

2. c) Answer:- Define Agent.

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

An agent can be characterized by its degree of autonomy, which refers to the context to which it can act indipendently of human intervention.

List of sensors

* Temperature sensors.   * magnetic sensors.
* proximity sensors   * Light sensors.
* Pressure sensors.   * Humidity sensors
* Accelerometers.   * Gas sensors.
* Gyroscopes

Actuators name of agent.

* Electric motors.   * piezoelectric accautor.
* Hydraulic actuators   * shape memory alloys.
* pen pneumatic Actuator.   * Electromagnetic Accuton.

overall, actuators are essential components of agents that allows them to interact with their environment and perform tasks.

Answer to the question No 3 (a)

3. a) Answer :-

PEAS stands for performance measure, environment, Actuators and sensors and it is a framework used in artificial intelligence to design and evaluate intelligent agent.

Performance measure

- Minimize the average time it takes for a user to complete a transaction.

- maximize the accuracy of transactions.

- minimize the occurrence of errors of malfunctions.

Environment:-

- The physical environment includes the ATM machine and its components such as the display screen, card reader, keypad, and cash dispenser.

- the social environment includes the user interacting with the ATM, such as inputting their pin and selecting their desired transaction.

Actuators:-

- Display screen to display transaction options and prompts.

- card reader to read the user's debit and credit card.

- keypad to input the users pin and transaction details.

- cash dispensier to dispenses cash to the user

· Sensors:-

- card reader to deetor the presence of a card and read the card information

- keypad to deeted to user input and confirm the transaction. details.

- card dispenser to deeted the amount of cash dispensed

- sensors to deeted the status and functional of the ATM components, such as the card reader and cash dispenser.

overall the PEAs framework provides a usefool way to analyze and design intelelligent agents, such as an Automat teller machine, and to eveloate their performance in achieving their goals in a given environment.

Answer to the question NO 3.(b)

3.b) simple reflex agent.
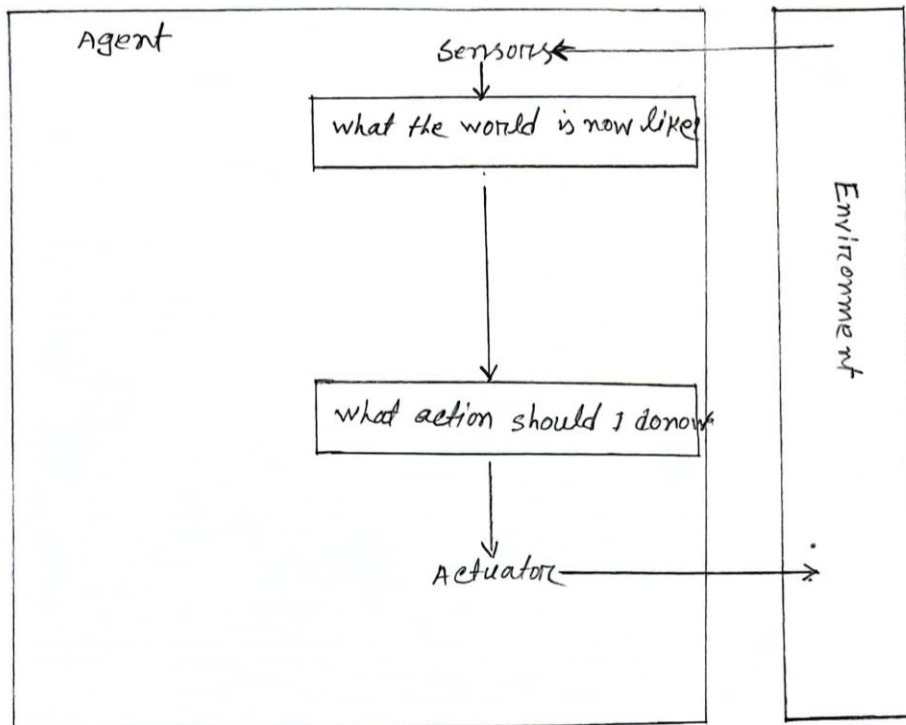
simple reflex agents

Describe simple reflex agents

table lookup of percept-action paired defining all possible condition-action rules necessary to interact in an environment.

problem:-
- too big to generate and to store (chess has about 10^{120} states for example)

- No knowledge of non-perceptual parts of the current state.

- No adaptive to changes in the environment, requires entire table to be updated if change occur

- Looping : can't make actions conditional.

>>> END <<<