**TUTORIAL 1**

Q1)To what extent are the following computer systems instances of artificial intelligence:

• Supermarket bar code scanners – Are not considered systems of AI

• Web search engines. -: Uses AI technology as it google making recommendations to search from when typing in the search engine

• Voice-activated telephone menus - : They do not use AI in such a way. They use pre-programmed

• Internet routing algorithms that respond dynamically to the state of the network. - : Not considered instances of AI

Q2) Is AI a science, or is it engineering? Or neither or both? Explain

AI can be both science and engineering,

1. Science: AI involves scientific principles and methodologies in various ways:
   * Computational models and algorithms: AI researchers develop mathematical models and algorithms to represent and simulate intelligent behavior. These models draw upon concepts from mathematics, statistics, logic, and cognitive science.
   * Machine learning and data analysis: AI heavily relies on machine learning techniques, which involve training models on data and deriving patterns and insights. This process often involves statistical analysis and experimentation.
   * Cognitive science and neuroscience: AI researchers often draw inspiration from the study of human cognition and the functioning of the brain to develop AI models and systems that mimic or simulate intelligent behavior.
2. Engineering: AI is also an engineering discipline due to its practical implementation and application in real-world systems:
   * System design and development: AI engineers apply scientific knowledge to design and develop AI systems that solve specific problems or tasks. This involves developing software architectures, integrating various components, and optimizing system performance.
   * Software engineering: AI systems require robust and scalable software implementations. Engineers need to design and build software frameworks, libraries, and tools that enable the development and deployment of AI models and applications.
   * Ethical considerations and deployment: AI engineers consider ethical implications, social impact, and legal aspects when developing and deploying AI systems. This involves making engineering decisions that ensure fairness, transparency, privacy, and accountability.

Q3) Write the PEAS description for the following agents?

i. Taxi Driver

ii. Part-picking robot

iii. Interactive Mathematics Tutor

iv. Biding Agent

v. Web Search Agent

vi. Medical Diagnostic Agent

vii. Game Agent

1. Taxi Driver:

* Performance Measure: Safely and efficiently transport passengers to their requested destinations while adhering to traffic laws and maximizing earnings.
* Environment: Road network, traffic conditions, passengers, other vehicles, traffic signals, weather conditions.
* Actuators: Steering wheel, accelerator, brakes, turn signals, communication devices.
* Sensors: Cameras, GPS, traffic sensors, passenger requests, vehicle condition sensors.

1. Part-picking Robot:

* Performance Measure: Accurately and efficiently pick and place parts according to specifications while minimizing errors and maximizing productivity.
* Environment: Warehouse or factory floor, shelves, bins, conveyor belts, other robots, parts.
* Actuators: Robotic arm, gripper, conveyor systems.
* Sensors: Vision systems, depth sensors, object recognition, proximity sensors.

1. Interactive Mathematics Tutor:

* Performance Measure: Help students understand and solve mathematical problems effectively, improve learning outcomes, and adapt to individual student needs.
* Environment: Classroom or online learning platform, textbooks, math problems.
* Actuators: Instructional materials, explanations, step-by-step guidance, practice exercises.
* Sensors: Student input, progress tracking, error analysis, feedback evaluation.

1. Bidding Agent:

* Performance Measure: Secure the most advantageous bids and negotiate successfully in auctions while optimizing profitability.
* Environment: Online auction platforms, bidding rules, other bidders.
* Actuators: Placing bids, submitting offers, negotiation tactics.
* Sensors: Auction information, bidding history, current bid prices, competitors' actions.

1. Web Search Agent:

* Performance Measure: Provide accurate and relevant search results to users based on their queries, improving user satisfaction and search efficiency.
* Environment: Internet, search engine, web pages, user queries.
* Actuators: Crawling web pages, indexing, ranking algorithms, displaying search results.
* Sensors: User queries, web page content, user interactions, search history.

1. Medical Diagnostic Agent:

* Performance Measure: Accurately diagnose medical conditions, recommend appropriate treatments, and improve patient health outcomes.
* Environment: Medical facility, patient information, medical databases, symptoms, medical tests.
* Actuators: Generating diagnoses, suggesting treatments, ordering tests.
* Sensors: Patient symptoms, medical records, test results, medical literature.

1. Game Agent:

* Performance Measure: Achieve success in the game by maximizing points, winning matches, or accomplishing specific objectives.
* Environment: Game environment, opponents, game rules, virtual world.
* Actuators: Game controls, movements, interactions, strategy decisions.
* Sensors: Game state, opponent actions, virtual world feedback, scoring updates.