BAI - EXPERIMENT 2

Nidhi Niraj Worah

AIML, 60

BAI - EXPERIMENT 2

AIM:

1. Design an intelligent system using PEAS

2. Problem Definition with state space representation

THEORY:

PEAS System is used to categorize similar agents together. The PEAS system delivers the performance measure with respect to the environment, actuators, and sensors of the respective agent. Most of the highest performing agents are Rational Agents. **Rational Agent:** The rational agent considers all possibilities and chooses to perform the highly efficient action. For example, it chooses the shortest path with low cost for high efficiency. **PEAS** stands for a *Performance measure, Environment, Actuator, Sensor*.

1. **Performance Measure:** Performance measure is the unit to define the success of an agent. Performance varies with agents based on their different precepts.

2. **Environment**: Environment is the surrounding of an agent at every instant. It keeps changing with time if the agent is set in motion. There are 5 major types of environments:

   - Fully Observable & Partially Observable

   - Episodic & Sequential

   - Static & Dynamic

   - Discrete & Continuous

   - Deterministic & Stochastic

3. **Actuator**: An actuator is a part of the agent that delivers the output of action to the environment.

4. **Sensor**: Sensors are the receptive parts of an agent that takes in the input for the agent.

1. PEAS Table

Aa Event	☰ Performance	☰ Enviornment	☰ Actuators	☰ Sensors
1. Playing soccer	scoring goals, defending	playground, teammates, opponents, ball, weather, crowd	tackling, passing ball, shooting	camera, location sensor, other players locator, speed sensor
2. Playing a tennis match	winning	playground, racquet, ball, opponent	ball, raquet, joint arm	ball locator, camera, racquet sensor, opponent locator
2. tspark sports event organization	winning	playground, ball, opponents	passing, shooting, throwing	camera, ball locator, other players locator, location sensor
4. Water Jug problem	Successfully reach the goal, number of moves	a 4 gallon jug, a 3 gallon jug, water, table	robotic arm, pump	sensor to detect waterlevel, camera, weight sensors
5. Performing high jump	running, winning	players, opponents, refree, audience, playground	robotic leg, robotic arm	camera, touch sensors

2. State Space Representation

Aa Name	☰ States	Initial State	☰ Final State	☰ Actions
Water Jug Problem	Arrangements with of 5 and 3 gallon jugs with different proportions of water filled	Both the gallons empty	4 gallon of water filled in a jug	Add/ deduct water from either of the gallons to reach the final state
The 8 puzzle problem	Different positions of tiles	Any random shuffled state	Check whether the given state matches the goal	moving tiles (up, down, left, right)
Untitled				

Conclusion:

1. We are able to define PEAS for any given problem statement

2. We are able to present State Space Representations for the given problem statements