PEAS

PEAS is a framework in AI that helps define the components necessary for designing intelligent agents. It stands for **Performance measure, Environment, Actuators, and Sensors**. Let's break it down with simple explanations and examples:

1. Performance Measure:

- **Definition**: This is how we measure the success of an AI agent. It's the criteria or goals that define how well the agent is doing.
- **Example**: In a **self-driving car**, the performance measure could be:
    - Reaching the destination quickly and safely.
    - Avoiding accidents.
    - Following traffic laws.

2. Environment:

- **Definition**: The surroundings in which the AI agent operates. This includes everything the agent interacts with.
- **Example**: For the **self-driving car**, the environment includes:
    - Roads.
    - Other vehicles, pedestrians.
    - Traffic lights, weather conditions.

3. Actuators:

- **Definition**: The tools or mechanisms the agent uses to act upon the environment. These are the parts of the agent that allow it to perform actions.
- **Example**: For the **self-driving car**, actuators would be:
    - Steering wheel to turn.
    - Accelerator and brake to control speed.
    - Signals and lights for communication.

4. Sensors:

- **Definition**: The tools or devices that gather information about the environment for the agent. They allow the agent to "sense" the world.
- **Example**: For the **self-driving car**, sensors include:
    - Cameras for visual input.
    - Radar and LIDAR for detecting objects and distances.
    - GPS for location tracking.

PEAS Example for a Self-Driving Car:

- **Performance Measure**: Safety, fuel efficiency, speed, following traffic rules, avoiding obstacles.
- **Environment**: Roads, other vehicles, pedestrians, traffic signals, weather conditions.
- **Actuators**: Steering wheel, brake, accelerator, turn signals, windshield wipers.
- **Sensors**: Cameras, radar, GPS, LIDAR, speedometer.

PEAS Example for a Robot Vacuum Cleaner:

- **Performance Measure**: Cleaning efficiency, battery life, avoiding obstacles, covering all areas.
- **Environment**: A house or room with furniture, dirt, and walls.
- **Actuators**: Wheels for movement, vacuum for cleaning, brushes for sweeping.
- **Sensors**: Bump sensors to detect walls, cameras for navigation, dirt sensors to detect how dirty the floor is.

PEAS Example for a Chess AI:

- **Performance Measure**: Winning the game, minimizing the number of moves, maximizing the score.
- **Environment**: Chessboard with pieces, opponent's moves.
- **Actuators**: Moving pieces on the chessboard (digital or robotic arm).
- **Sensors**: Visual input of the chessboard (if physical) or data input of the board state (if digital).