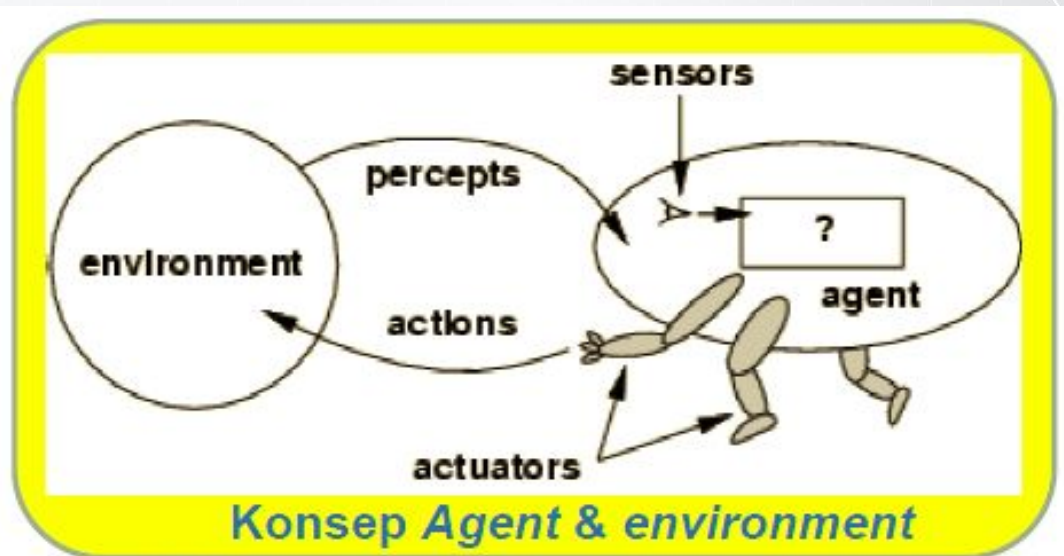
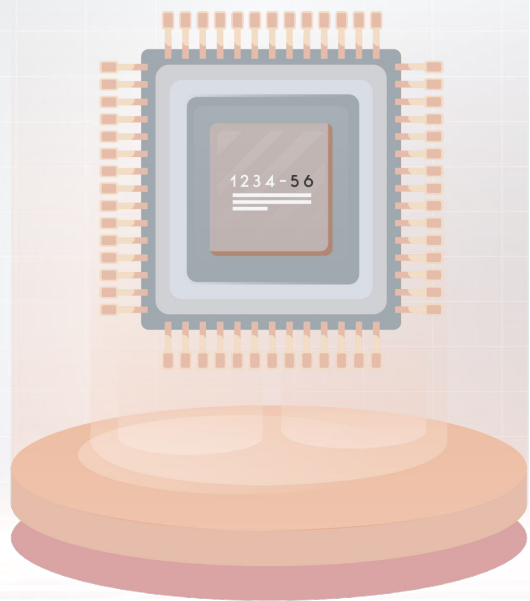




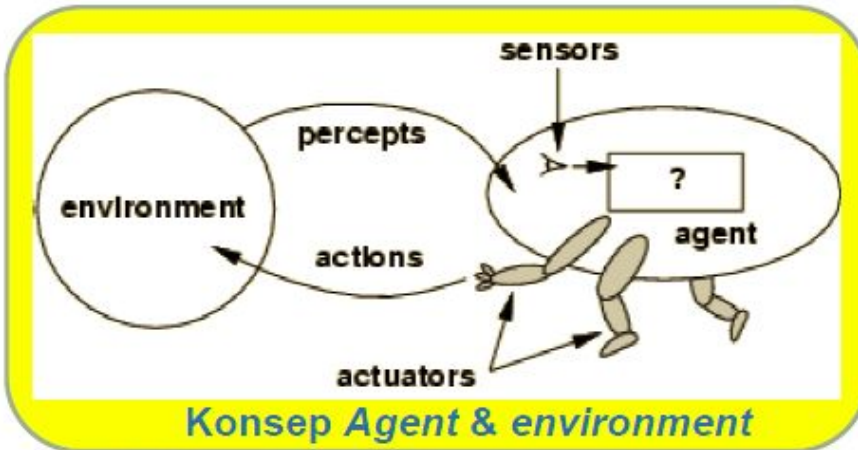
# INTELLIGENT AGENT

RATNA MUFIDAH, S.Kom., M.Kom.

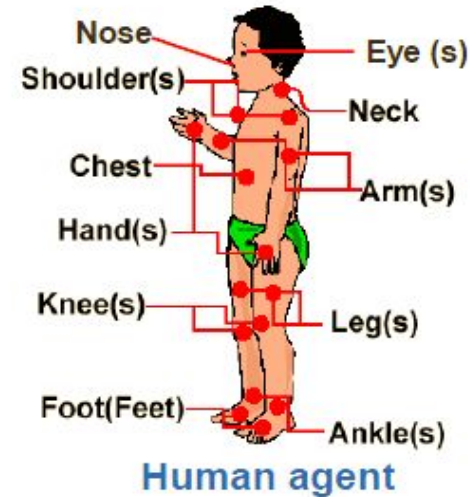


Sumber: S. Russel, P. Norving, Artificial Intelligen: A Modern Approach

# INTELLIGENT AGENT



Sumber: S. Russel, P. Norving, Artificial Intelligencen: A Modern Approach



- **Percepts:** input captured by the sensor
- **Actions:** the actions taken by the agent
- **Environments:** the environment around the agent
- **Actuators:** components through which energy is converted into motion
- **Agents:** humans, robots, softbots, etc



# INTELLIGENT AGENT

- **Rational:** Agents are able to do their best
- The purpose of the agent must be defined
- **Goal :** Performance measures
- **Rational Agent:** An Agent always acts to maximize performance measure, considering what he observes from the environment and other knowledge he has

Agent	Goal	Performance Measure
Student	graduated from college	GPA (grade-point average)
Employee	rich	monthly salary



# Task Environment : PEAS

**We must define the task environment when designing the agent**

The way to define the task environment is through defining **PEAS**.

## **P: Performance Measure**

What are the components of success for an agent?

## **E: Environment**

What conditions exist around the agent?

## **A: Actuators**

What can the agent do?

## **S: Sensors**

What is the input to the agent?



# PEAS : The agent–Auto taxi

## **P: Performance Measure**

arrive at the destination, obey traffic regulations, travel comfortably, save fuel

## **E: Environment**

road, traffic, pedestrians, passengers

## **A: Actuators**

steering wheel, gas, brake, horn, turn signal

## **S: Sensors**

Video, speedometer, GPS



# PEAS : The agent–Medical Diagnosis System

## **P: Performance Measure**

patients recover, low cost, correct diagnosis

## **E: Environment**

patients, doctors, nurses, hospitals

## **A: Actuators**

monitor

## **S: Sensors**

keyboard

# Task Environment Characteristics



## **Static vs Dinamic**

Does the environment change or not?

## **Discrete vs Continuous**

Are the actions contained around the agent limited or continuous?

## **Single Agent vs Multi Agent**

Is there only one agent or more in an environment?

## **Fully Observable vs Partially Observable**

Whether agent sensors can access environmental conditions completely or not?



# Task Environment Characteristics

## **Episodic vs Sequential**

Does the agent need memory of past actions or not to perform the next action?

## **Deterministic vs Stochastic**

Is the environment random or agent-definable?

# Task Environment Characteristics

Task Environment	Observable	Agents	Deterministic	Episodic	Static	Discrete
Crossword puzzle	Fully	Single	Deterministic	Sequential	Static	Discrete
Chess with a clock	Fully	Multi	Deterministic	Sequential	Semi	Discrete
Poker	Partially	Multi	Stochastic	Sequential	Static	Discrete
Backgammon	Fully	Multi	Stochastic	Sequential	Static	Discrete
Taxi driving	Partially	Multi	Stochastic.	Sequential	Dynamic	Continuous
Medical diagnosis	Partially	Single	Stochastic	Sequential	Dynamic	Continuous
Image analysis	Fully	Single	Deterministic	Episodic	Semi	Continuous
Part-picking robot	Partially	Single	Stochastic	Episodic	Dynamic	Continuous
Refinery controller	Partially	Single	Stochastic	Sequential	Dynamic	Continuous
Interactive. English tutor	Partially	Multi	Stochastic	Sequential	Dynamic	Discrete

Figure 2.6 Examples of task environments and their characteristics.

# Agent Types

Simple Reflex Agent

Model-based reflex agents

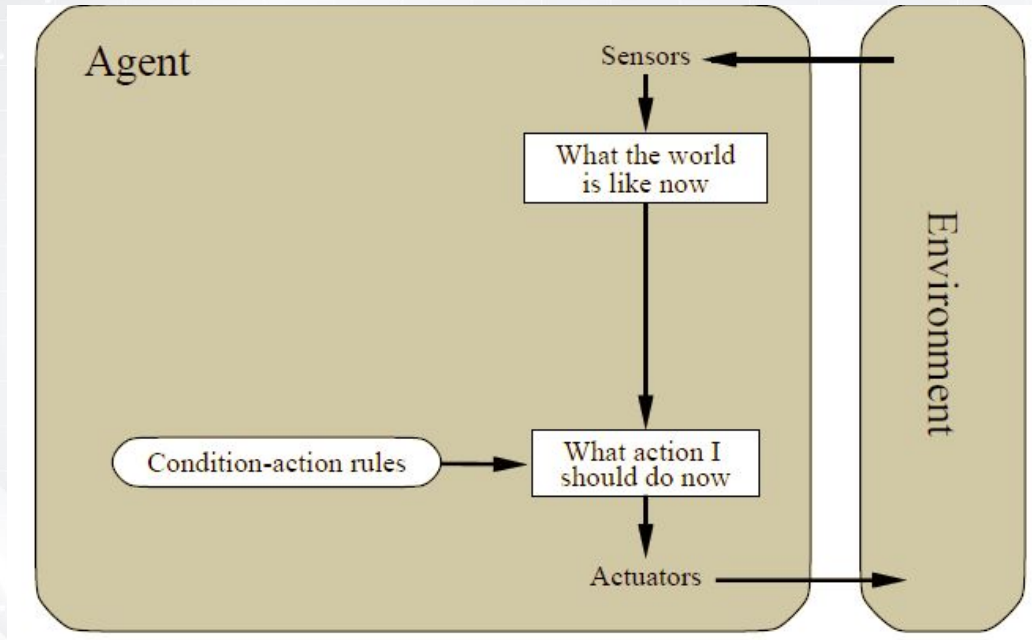
Goal-based agents

Utility-based agents

Learning agents

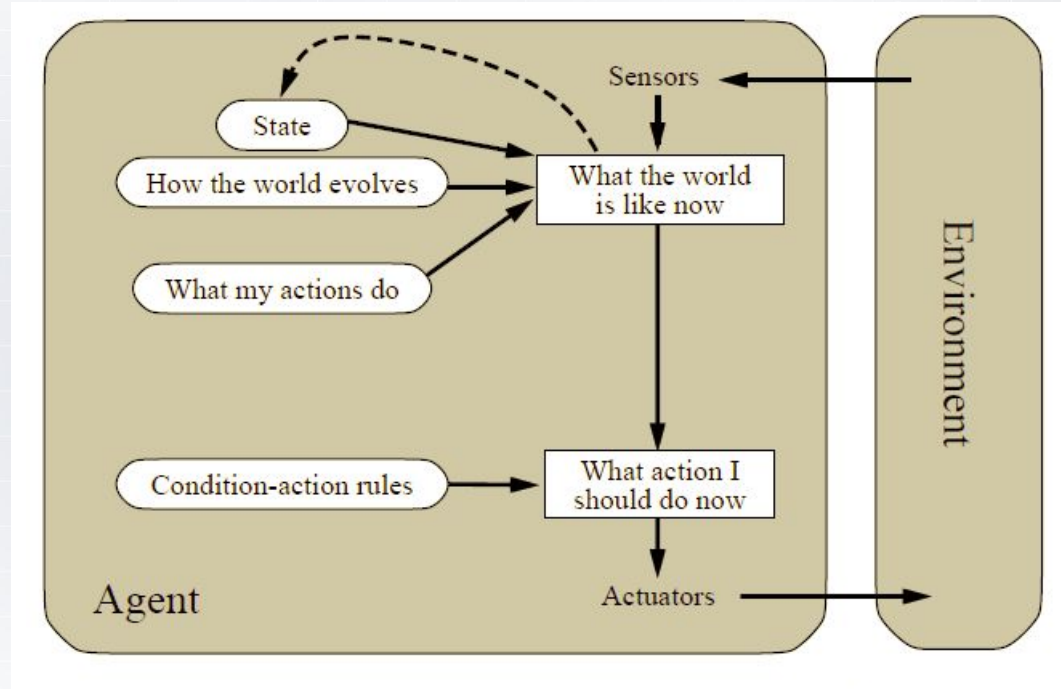
# Agent Types: Simple Reflex Agent

acts on the last input received by the sensor

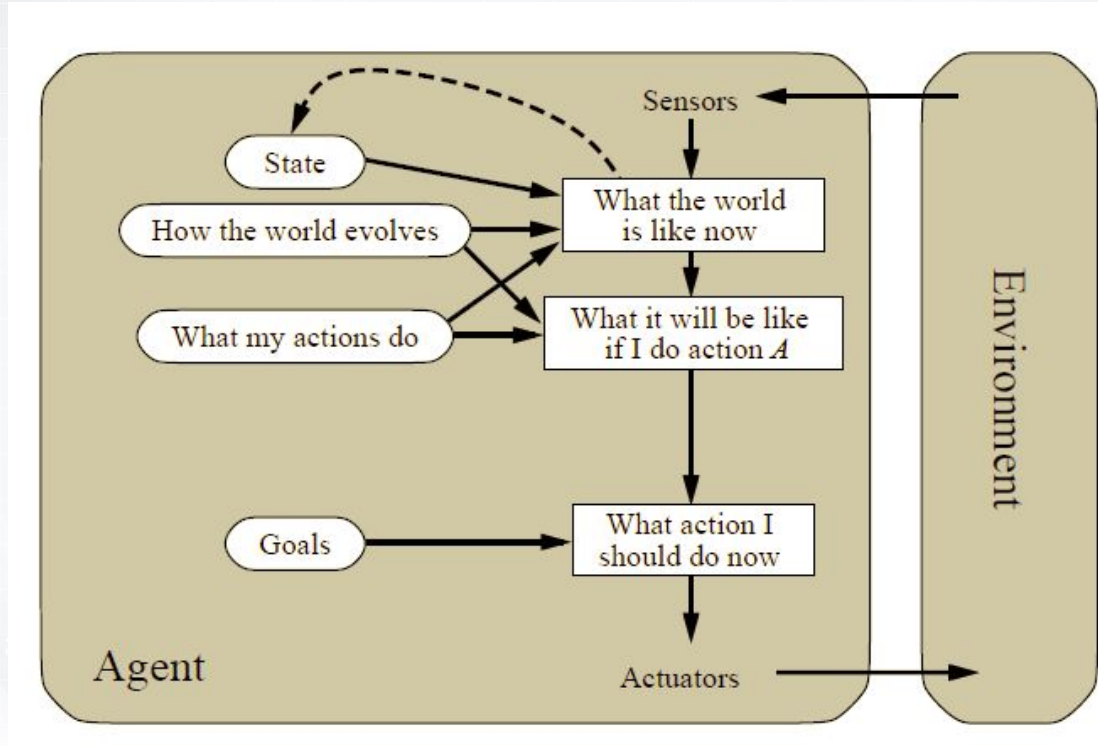


# Agent Types: Model-based Reflex Agents

acts on the last input received by the sensor and requires previous input to support the action

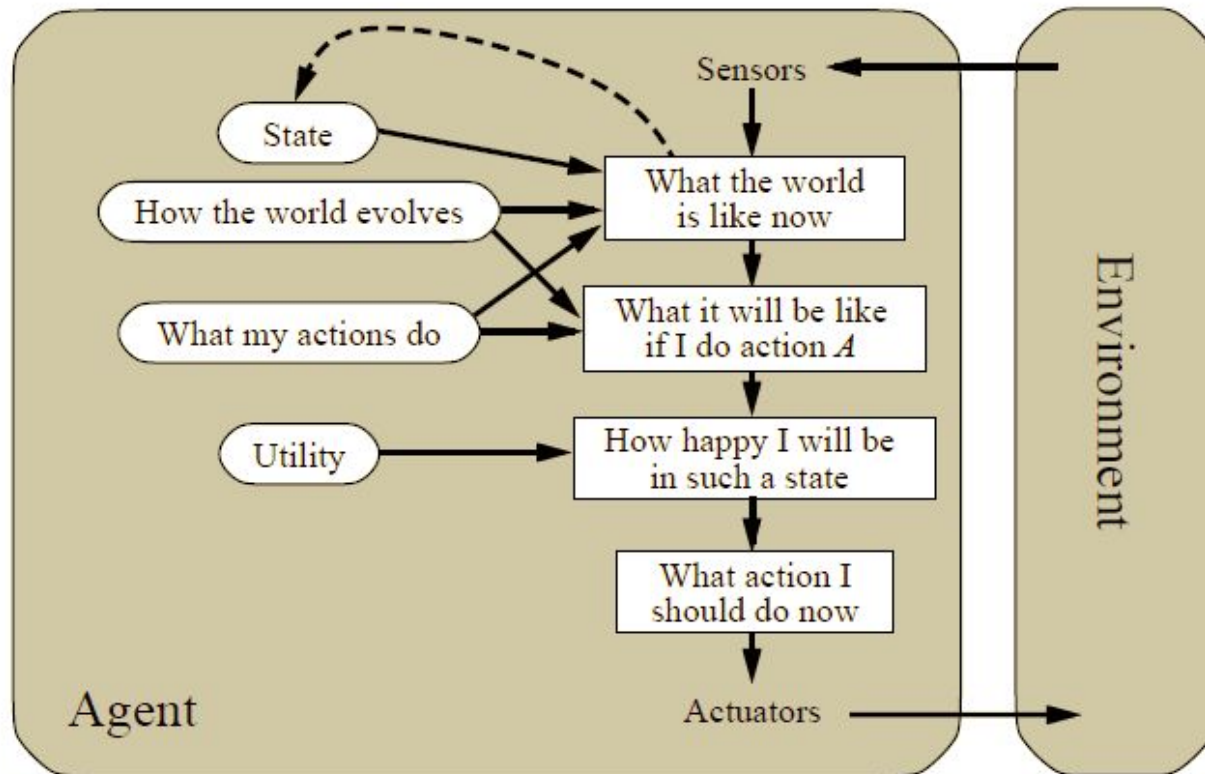


# Agent Types: Goal-based Reflex Agents



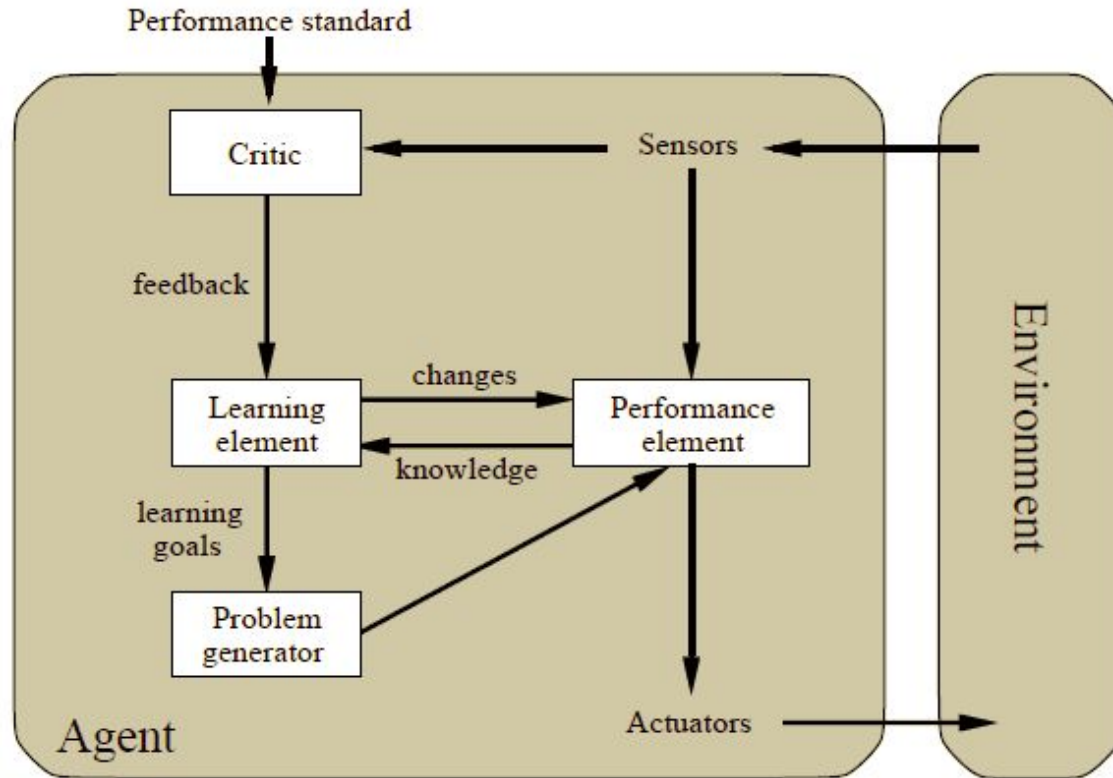


# Agent Types: Utility-based Reflex Agents



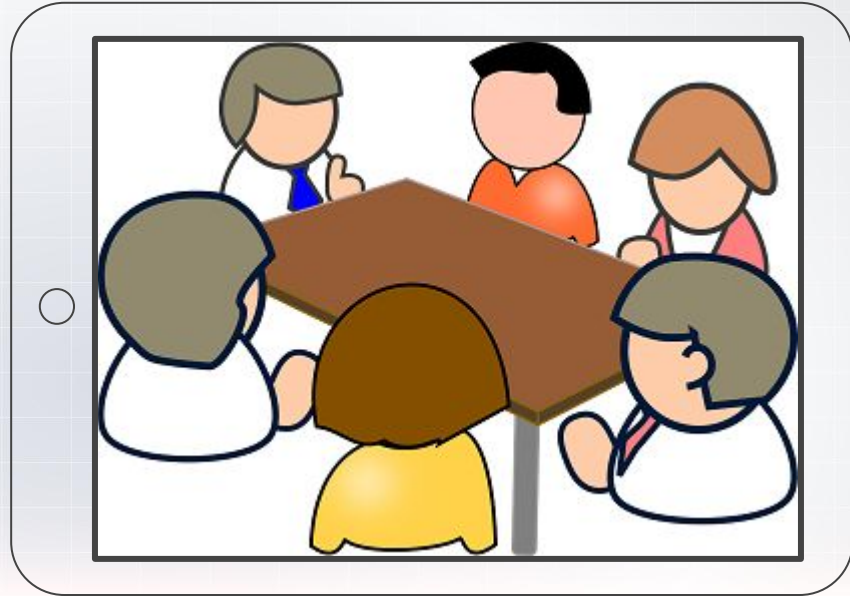


# Agent Types: Learning Agents



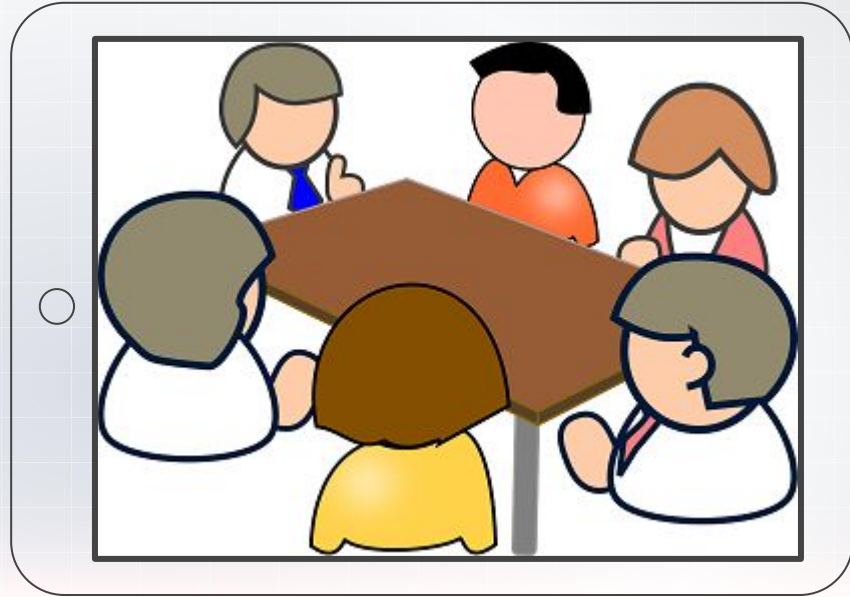
# Class Discussion (10 minutes)

1. The class will be divided into several groups
2. One group consists of 4 to 5 members
3. Group discussions are held for 10 minutes
4. The results of the group discussion will be presented in front of the class for 10 to 15 minutes
5. The presenter will get 1 questions from other groups



# Discussion Materials

**Mention another intelligent agent  
(only one) and determine its PEAS!**



The background features a light gray grid pattern overlaid with various geometric shapes. On the left, there are overlapping triangles in shades of gray and white. On the right, there are faint, thin white lines forming a network-like structure. In the bottom left and bottom right corners, there are decorative circular elements consisting of concentric arcs in blue and orange. The overall aesthetic is modern and minimalist.

# THANKS!

See You

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