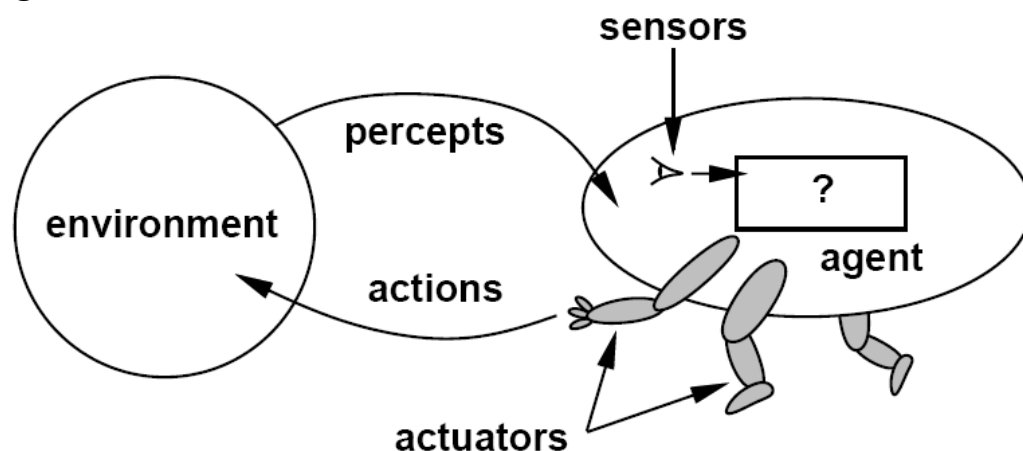


Section Content:✚ **Type of agents****Intelligence Definition**

- The ability to learn, solve problem, thinking and act rational

Agent Definition

- Is an any software program running **individual** on the machine as robot
- An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators

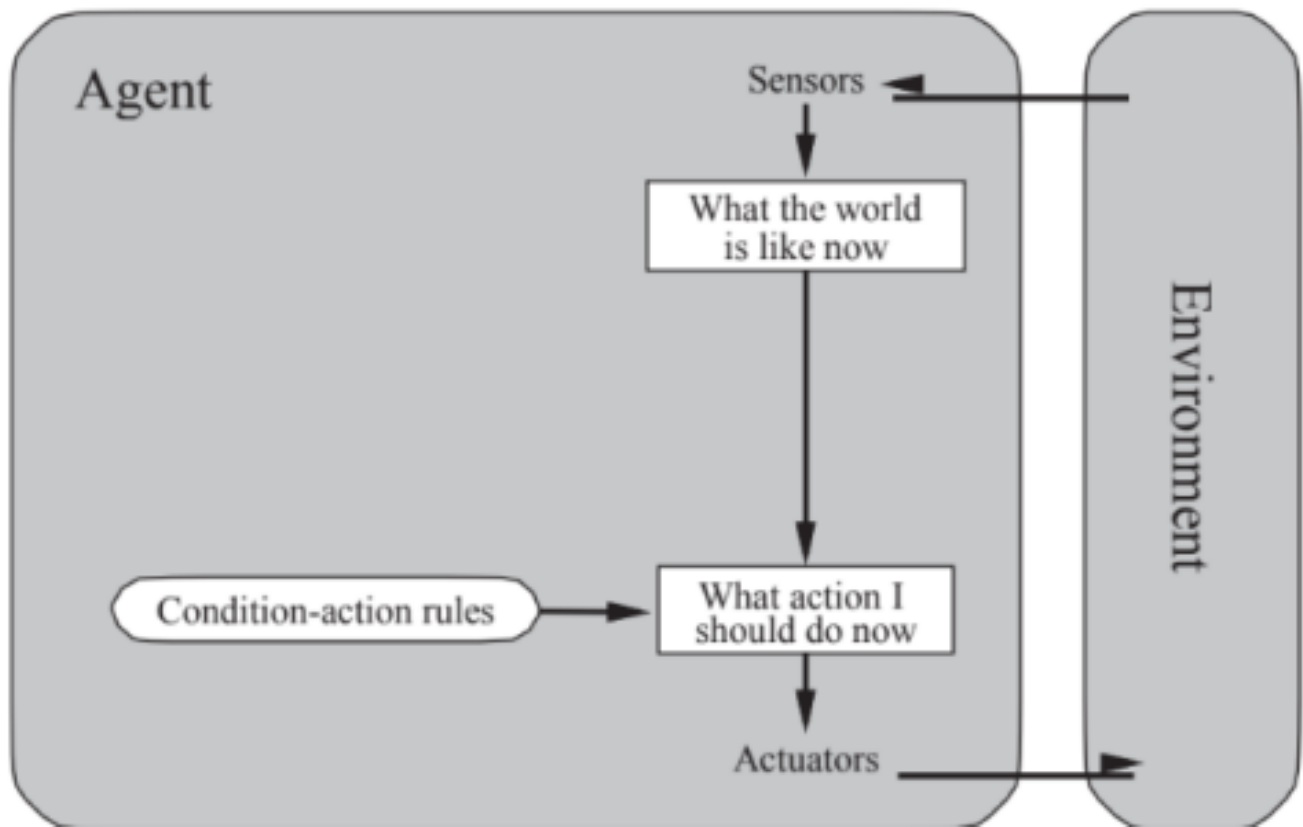
**Deferent between Agent and software program**

Point	Agent	Software program
Definition	Is a software that acts autonomously, makes decisions, and can adapt to achieve goals.	specific instructions, usually needing user input and doesn't act independently or adapt on its own.
Example	A virtual assistant like Siri or Alexa	A calculator app

Type of agents

Simple Reflex agent

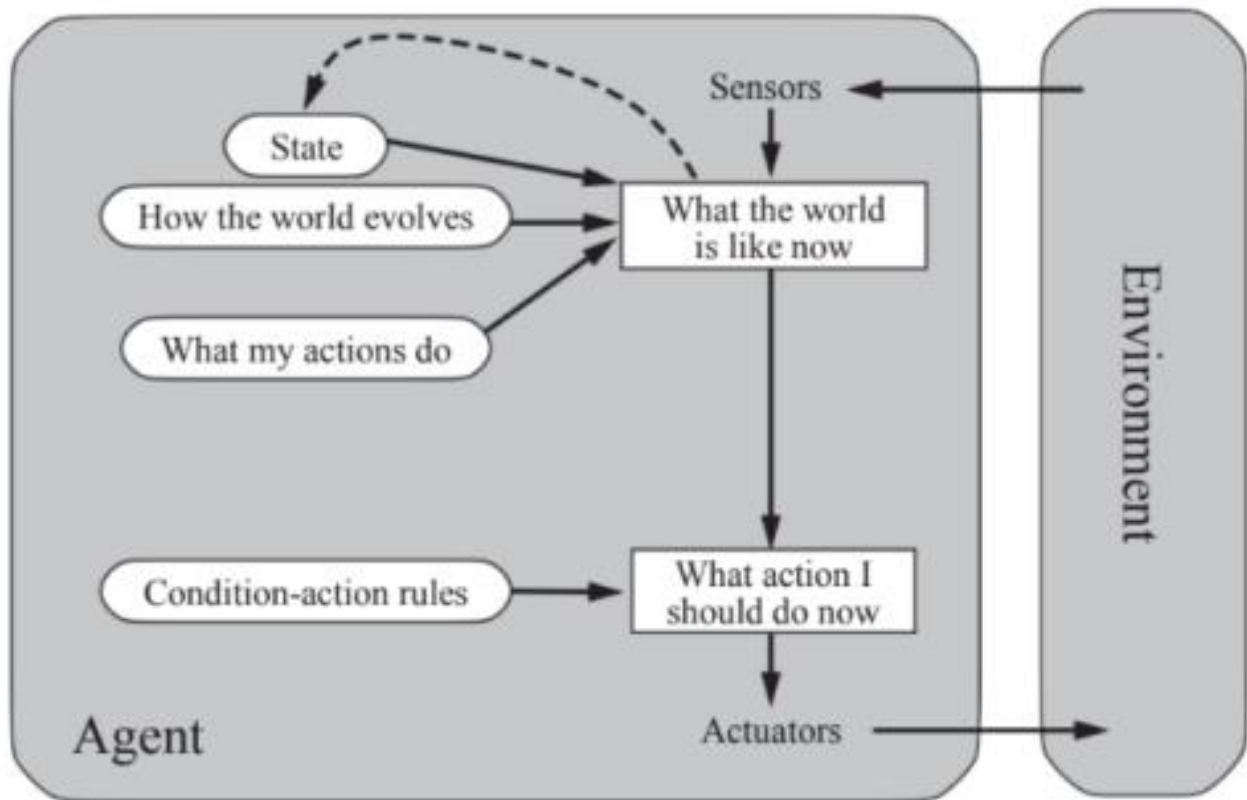
- Makes decisions based only on what it senses right now, without thinking about past actions.



- **Automatic door:** It opens when someone steps in front of a sensor and closes when no one is there. It reacts only to whether someone is present at the moment

Model based reflex agent

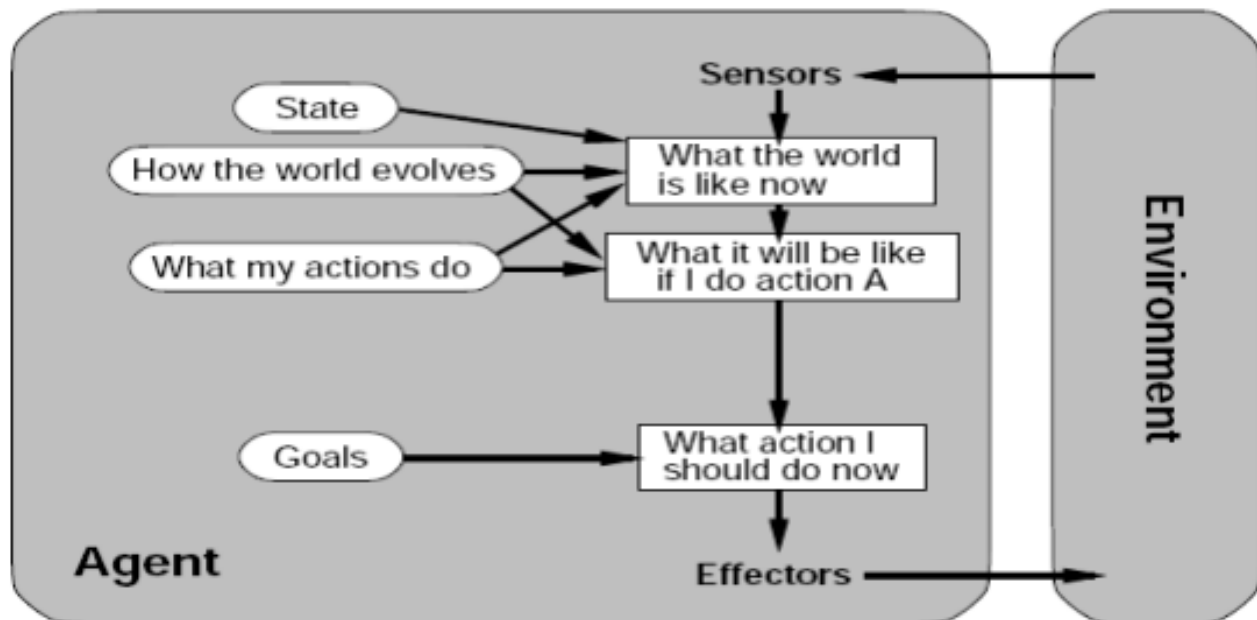
- Acts based on both current observations and an internal model of the world. It remembers past information to help it make better decisions.



- **A self-driving car** that knows its current speed and remembers the location of traffic lights. It doesn't just react to what's immediately in front but also uses memory to avoid obstacles and follow traffic rules.

Goal based agent

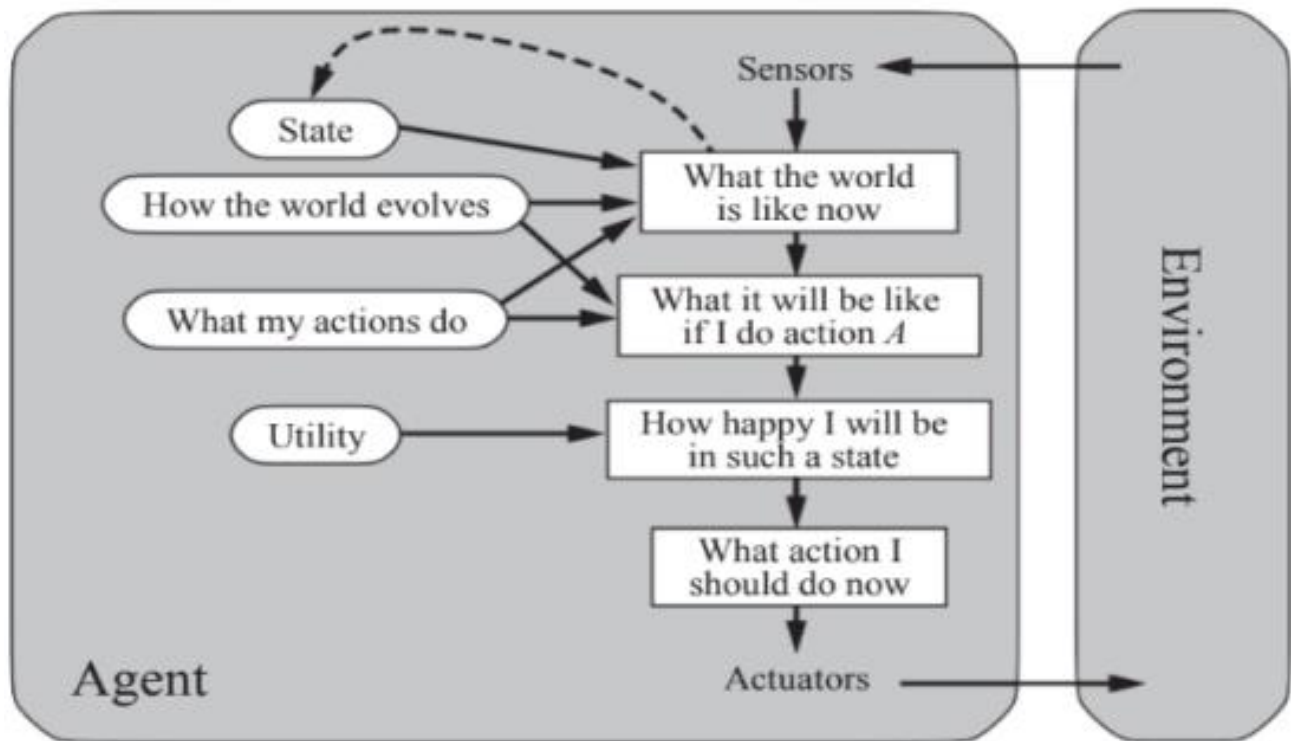
- Makes decisions based on specific goals it wants to achieve. It evaluates different actions to find the best way to reach its goals.



- **A navigation app** that helps you find the quickest route to a destination. It looks at multiple paths and chooses the one that gets you there the fastest, considering traffic and road conditions to achieve the goal of arriving on time.

Utility agent

- Makes decisions based on how much happiness or satisfaction (utility) it expects from different actions. It evaluates options to maximize its overall benefit.



- **A shopping app** that compares prices and reviews to suggest products. It chooses items that will provide the best overall value and satisfaction based on your preferences, like price, quality, and brand.

Example used across all four types of agents, showcasing how they would behave differently in the same scenario:

Scenario: Finding a Restaurant

1. Simple Reflex Agent

- **Behavior:** A basic app that lists nearby restaurants when you open it. If you press a button for "Italian," it immediately shows you the first Italian restaurant it finds, without considering any other options.

2. Model-Based Reflex Agent

- **Behavior:** An app that remembers which restaurants you've liked or disliked based on previous visits. If you've previously marked a restaurant as "too noisy," it avoids suggesting that one again when you search for "Italian."

3. Goal-Based Agent

- **Behavior:** An app that helps you find a restaurant based on your goal of having dinner with friends. It considers factors like distance, type of cuisine, and user reviews to suggest the best options that fit your specific goal of having a nice dinner.

4. Utility Agent

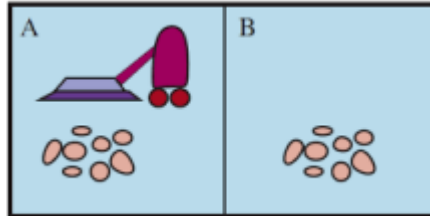
- **Behavior:** An app that evaluates all nearby restaurants by calculating an overall score based on factors like price, cuisine type, and user ratings. It suggests the restaurant that gives you the highest utility based on your preferences for quality and cost, maximizing your satisfaction.

Summary of Differences:

- **Simple Reflex Agent:** Reacts to immediate conditions without memory.
- **Model-Based Reflex Agent:** Uses current data and remembers past states.
- **Goal-Based Agent:** Focuses on achieving specific goals with decision-making.
- **Utility Agent:** Evaluates options to maximize satisfaction based on preferences.

Assignment

1. Solve Exercise chapter 2 at book
2. Write a Python program to create a reflex based agent that fulfills the following:



- a. Perception and action: the agent should be able to perceive its immediate surroundings (the current location in grid) like shown in the figure to identify dirt patches and obstacles.
 - b. Movement: the agent should move towards dirt patches while avoiding obstacles. The agent can move up, down, left or right in the grid.
 - c. Cleaning: upon reaching a cell with dirt patch, the agent should clean it (identify state)
3. Write a Python program to create a reflex based agent that fulfills the following:
 - a) The agent should accept two inputs: weather condition and time of day. Weather conditions can include "sunny", "rainy", "snowy", and "cloudy". Time of day can include "morning", "afternoon", "evening", and "night".
 - b) Implement a function `decide_outfit (weather, time_of_day)` that decides an activity or precaution based on the given weather and time. For example, if it's "rainy" and "morning", the agent might suggest "Take an umbrella" or "Wear waterproof boots". Sunny, [morning, afternoon] then agent suggest wear light clothing and sunhat .if it's rainy [morning or afternoon] then agent suggests "waterproof jacket" rainy[night] agent suggests "warm, waterproof and umbrella". if it's snowy [morning or afternoon or evening] the agent suggests "heavy winter clothing"
 - c) Agent Responses: The agent should have a variety of responses for different combinations of weather and time. Ensure that the agent covers all combinations of the given weather conditions and times of day.