W 3.1

course	🤖 AI
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Resource	☐

Notes

Agents:

- An **agent** is a system that can **perceive** its environment and **act** upon it to achieve goals.
- It can be thought of as an **architecture** (hardware and software) with an **agent program** that controls its behavior.

Types of Agents:

1. **Simple Reflex Agents:**
    - React to their environment based **solely on the current percept** (sensory input) they receive.
    - Limited in their ability to handle complex situations.
    - Example: A thermostat adjusting temperature based on the current reading.
2. **Model-Based Agents:**
    - Maintain an **internal model** of the environment to **predict future states** based on current percepts and past experiences.
    - Can reason about the consequences of actions before taking them.
    - Example: A self-driving car using a map and sensor data to navigate.

3. **Utility-Based Agents:**
    - Select actions that **maximize their expected utility** (a measure of how desirable an outcome is).
    - Assign values to different outcomes and choose actions that lead to the most beneficial ones.
    - Example: A chess-playing AI evaluating different moves based on their potential outcomes.
4. **Goal-Based Agents:**
    - Have **specific goals** they aim to achieve.
    - Proactively **plan** their actions and **monitor** their progress towards the goal.
    - Example: A robot following instructions to assemble a product.
5. **Learning Agents:**
    - Continuously **learn** from their experiences and improve their performance over time.
    - Consist of three key elements:
        - **Learning element:** Updates the agent's knowledge based on new information.
        - **Critic element:** Evaluates the agent's performance and provides feedback.
        - **Performance element:** Selects actions based on the agent's current knowledge and goals.
    - Example: A recommendation system learning user preferences to suggest relevant items.