Reinforcement Learning— Concept Document

Name: Sambathini Paul Jonathan
Day: 4
Topic: Reinforcement Learning

1. **Definition:** Reinforcement Learning (RL) is a learning method where an agent interacts with an environment and learns by receiving rewards or penalties.
2. **Core Idea:** The agent tries different actions and gradually discovers which actions bring the highest rewards.
3. **Main Components:**
    - **Agent** – decision-maker
    - **Environment** – system the agent acts in
    - **State, Action, Reward** – describe each interaction
4. **Learning Process:** The agent observes a state → chooses an action → receives a reward → updates its strategy (policy).
5. **Algorithm Example: Q-Learning**, which stores values for each state–action pair and updates them based on experience.
6. **Applications:** Used in robotics, gaming, navigation, and recommendation systems.
7. **Conclusion:** RL teaches machines to make decisions through experience rather than predefined labels.

Reflection (5–6 Lines)

I learned how agents learn from feedback instead of explicit supervision.
The idea of balancing exploration and exploitation was interesting and challenging.
Watching how rewards shape future actions clarified the learning cycle.
Understanding Q-values helped me connect mathematical updates with practical behavior.
Reinforcement Learning showed how AI can learn and improve through continuous interaction.