

1. How does reinforcement learning (RL) differ from other machine learning paradigms such as supervised and unsupervised learning?

A) RL relies solely on labeled data like supervised learning

B) RL involves an agent interacting with an environment to maximize cumulative reward, unlike supervised and unsupervised learning

C) RL only focuses on clustering and pattern recognition

D) RL does not involve any learning process, only rule-based actions

Answer: B) RL involves an agent interacting with an environment to maximize cumulative reward, unlike supervised and unsupervised learning

2. What is the primary difference between exploration and exploitation in reinforcement learning?

A) Exploration focuses on maximizing immediate rewards, while exploitation focuses on gathering new information

B) Exploration focuses on gathering new information, while exploitation focuses on maximizing known rewards

C) Exploration and exploitation are the same concepts used interchangeably

D) Exploitation is only used in supervised learning, while exploration is used in reinforcement learning

Answer: B) Exploration focuses on gathering new information, while exploitation focuses on maximizing known rewards

3. What is the main distinction between sparse and dense reward structures in reinforcement learning?

A) Sparse rewards are given frequently, while dense rewards are given rarely

B) Sparse rewards provide feedback at every step, while dense rewards provide feedback occasionally

C) Sparse rewards are provided infrequently, while dense rewards provide frequent feedback

D) Dense rewards are irrelevant in reinforcement learning

Answer: C) Sparse rewards are provided infrequently, while dense rewards provide frequent feedback

4. Why is reward important in reinforcement learning?

A) It provides the primary signal for the agent to learn and improve its actions

B) It is used to store the agent's past experiences

C) It helps the agent memorize the environment states

D) It has no impact on the learning process of the agent

Answer: A) It provides the primary signal for the agent to learn and improve its actions

5. What is the key difference between a policy and a plan in reinforcement learning?

A) A policy is a fixed sequence of actions, whereas a plan is a function mapping states to actions

B) A policy is a function mapping states to actions, while a plan is a predefined sequence of actions

C) A policy is used only in model-based RL, while a plan is used in model-free RL

D) There is no difference; both terms mean the same

Answer: B) A policy is a function mapping states to actions, while a plan is a predefined sequence of actions