

Design and conduct a controlled experiment to study the effect of Q-learning parameters and environment complexity on the agent's performance.

1. Modify your implementation to test at least three different configurations, such as:
 - Different learning rates (α) (e.g., 0.1, 0.5, 0.9)
 - Different exploration rates (ϵ) (e.g., 0.1, 0.3, 0.7)
 - Different grid sizes or number of obstacles
2. For each configuration:
 - Train the agent for the same number of episodes
 - Record the following:
 - Total reward achieved
 - Number of steps taken to reach the goal
 - Convergence behavior (number of episodes to stabilize)
3. Tabulate your results clearly in a table format.
4. Perform analysis and inference:
 - Compare the results across different configurations
 - Identify which parameter setting gives the best performance
 - How changes in parameters affect learning efficiency and decision-making