In conclusion, the integration of Q-learning and SARSA with the Whale Optimization Algorithm (WOA) has demonstrated significant improvements in solving complex optimization problems compared to conventional WOA and other benchmark algorithms. Our integrated variants consistently outperformed across various instances, achieving optimal solutions in several cases and demonstrating competitive performance close to optimal solutions on average.

Moreover, these integrated approaches streamlined the optimization process, significantly reducing tuning times. Detailed analysis of exploration and exploitation graphs revealed consistent convergence patterns with smaller variations and occurrences in our integrated variants, indicating potential for enhanced problem-solving capabilities.

Looking ahead, further validation and parameterization of results obtained from exploration and exploitation graphs are essential. Standardized metrics for comparison and incorporation into reinforcement learning agents' learning processes hold promise for advancing the optimization capabilities of metaheuristic algorithms. Overall, these findings underscore the potential of integrating reinforcement learning techniques with metaheuristic algorithms for effectively tackling complex optimization challenges.

In addition to the current advancements, future endeavors should explore the potential of leveraging SARSA's capability to store experiences for further improving the performance of the integrated SARSA Whale Optimization Algorithm (WOA). By incorporating this feature, the SARSA WOA variant could effectively learn from past experiences, enabling it to adapt more efficiently to varying optimization landscapes. This iterative process of learning and adaptation holds promise for enhancing the robustness and effectiveness of the SARSA-integrated WOA in solving complex optimization problems. Furthermore, continued research into parameterization of results obtained from exploration and exploitation graphs will be crucial in providing a standardized metric for comparison and further advancing the optimization capabilities of metaheuristic algorithms. Overall, these future directions highlight the potential for continuous refinement and improvement of SARSA-integrated WOA, ultimately contributing to more efficient and effective solutions for challenging optimization tasks.