### **Critical Reflection**

*Project Name:* AI Pathfinding Showcase   
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*(500 words)*

**1. Introduction**

A pathfinding visualiser demonstrating BFS and A\* algorithms, highlighting clear visualisation, UI interactions, and real-time adjustments.

**2. Key Achievements**

* *Successfully implemented real-time grid manipulation and visualisation.*
* *Created clear visual indicators of search progress (colours, labels).*
* *Developed interactive UI components (sliders and buttons), enhancing usability.*
* *Fully functional search algorithms accurately visualise BFS and A\* pathfinding processes.*

**3. Challenges and Problems Encountered**

* **UI Layout issues:** Difficulty managing Unity UI components (e.g., alignment, disappearance of sliders during adjustments).
* Slider interactions during searches initially caused crashes.
* **Time management**: Tight deadlines, required prioritising critical features over some polish.

**4. Lessons Learned**

* *Improved understanding of Unity UI management and troubleshooting layout groups.*
* *Reinforced the importance of incremental changes and frequent testing to avoid regression issues.*
* *Enhanced debugging skills to quickly identify problems like sliders disappearing or crashes.*

**5. Future Improvements and Next Steps**

* *Better UI design: More intuitive layout, clear separation of concerns in UI.*
* *Additional pathfinding algorithms (e.g., Dijkstra, DFS) for expanded comparison.*
* *Performance optimisations to handle larger grids and smoother animations.*
* *Robust error handling to prevent runtime adjustments from causing crashes.*

**6. Conclusion**

*Overall, the project achieved its goals of visualizing BFS and A\* clearly and interactively. Despite some UI issues and tight schedules, valuable insights into Unity development and UI design were gained, providing a solid foundation for future enhancements.*