Self-Assessment Submission

Tour Guide - Multi-Agent AI System

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4. GitHub Repository: https://github.com/DVIRO44/llmcourse-hw4-google-maps

5. Self-Recommended Grade: 93

6. No special comments

7. No additional special documents

8. Summary Self-Assessment

Category	Weight	Self-Score
Project Documentation (PRD, Architecture)	20%	19/20
README & Code Documentation	15%	14/15
Project Structure & Code Quality	15%	14/15
Configuration & Security	10%	9/10
Testing & QA	15%	13/15
Research & Analysis	15%	15/15
UI/UX & Extensibility	10%	9/10
Total	**100%**	**93/100**

9. Justification

This project represents a comprehensive implementation of a multi-agent AI system designed to enhance road travel experiences through intelligent content curation. Over approximately six to seven weeks of development, the system has grown to encompass over 9,000 lines of production code, test suites, and documentation.

The architecture centers on a queue-based communication pattern that coordinates five specialized agents: Route Analyzer, YouTube Content Agent, Spotify Content Agent, History Agent, and Judge Agent. This design choice enables true parallel processing through Python's multiprocessing module, achieving approximately 2.8x speedup compared to sequential execution. The building block pattern with clearly defined input, output, and setup phases makes the system both maintainable and extensible.

Documentation emerged as a particular strength of this project. The PRD establishes clear requirements and success criteria, including ten diverse test routes spanning different geographic and cultural contexts. The architectural design document details the queue-based communication system, data flow patterns, and multiprocessing strategy. The task breakdown document maps the entire implementation across ten phases with 28 specific tasks, providing a clear roadmap that guided development.

Testing received significant attention, with 182 test functions covering unit tests, integration tests, and end-to-end scenarios. The test suite validates individual agent behaviors, queue communication reliability, and complete journey generation workflows. Mock objects isolate external API dependencies, ensuring tests remain fast and deterministic.

The research component includes a Jupyter notebook with five experiments analyzing system performance characteristics: route distance scaling, agent reliability patterns, content selection distribution, parallel processing efficiency, and parameter sensitivity. These experiments provide empirical validation of design decisions and identify optimization opportunities.

Areas for improvement include expanding the UI beyond the current CLI interface and implementing additional content sources. The initial development phase focused heavily on core functionality and architecture, leaving some extensibility features as future enhancements. The research notebooks, while comprehensive, were added toward the end of development rather than being integrated throughout the process.

The most valuable learning outcomes included mastering multiprocessing patterns in Python, designing resilient inter-process communication systems, and implementing

building block architectures that separate concerns cleanly. The Judge Agent's scoring mechanism required particular attention to ensure fair and consistent content evaluation across different media types.

10. Expected Review Rigor

Based on the self-assessed score of 93/100 (Excellent level), I expect a thorough and detailed review of all project components. Reviewers should examine the architectural decisions, code quality, test coverage, and research methodology with high standards. I welcome constructive feedback on any aspect of the implementation, particularly regarding the multiprocessing design and agent coordination patterns.

11. Academic Integrity Declaration

I declare that:

- ■ All work submitted is my own original work
- ■ I have properly cited all sources and references used
- ■ I have not plagiarized any content from other sources
- ■ I have not shared my code or solutions with other students
- ■ I have not received unauthorized assistance on this project
- ■ I understand the consequences of academic dishonesty