Assignment 2 - LSTM Frequency Extraction

Group Code: LLM_Agents_Tom_Igor_Roie

Submitters:

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GitHub Repository:

https://github.com/tomron87/LLM_Agent_Orchestration_HW2

Self-Assigned Grade: 92/100

Self-Evaluation Justification Form

Students:
Tom Ron, ID 301020723
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Project Title: Assignment 2 - LSTM Frequency Extraction from Mixed Signals
Submission Date: November 2025
Self-Assigned Grade: 92/100

Justification for Our Self-Evaluation

We chose a grade of 92 out of 100 based on systematic evaluation against course criteria. This reflects an "Excellent" level project with significant strengths alongside identified gaps.

Strengths:

The project demonstrates exceptional professionalism in several areas. First, we documented seven formal Architecture Decision Records (ADRs) explaining each major design decision, including alternatives considered and detailed reasoning. Second, we achieved a perfect test pass rate - 72 out of 72 tests passing, indicating high code quality. The documentation includes 11 comprehensive documents totaling over 200 pages, including a 726-line extension guide and a 1,403-line prompt log documenting the entire development process. The code includes 100% docstring coverage, professional configuration management, and structured logging framework.

Weaknesses:

The main gap is test coverage of only 42%, compared to the target of 85%. The core training module is covered at only 20%. Evaluation and visualization modules are covered at 37-42%. Expanding test coverage to 85% would have required a great amount of additional work, which was not possible within the time constraints. Additionally, the ADR documents could have included more quantitative data and diagrams.

Time Investment:

Approximately 80 hours were invested in developing the project: 30 hours on code and models, 25 hours on documentation and ADRs, 15 hours on testing, and 10 hours on analysis and results. The Level 4 improvements required an additional 5 hours.

Innovation:

The key breakthrough was discovering the phase scaling factor (0.01). The original task was impossible to learn due to full phase randomization. Reducing the phase factor by 100x transformed an impossible task (MSE 0.502) into a learnable task (MSE 0.199), a 2.5x improvement in MSE and 51x improvement in correlation.

Learning:

We learned about the importance of state management in LSTMs, the dramatic impact of hyperparameters on learning ability, and understood the difference between $L = 1$ and $L > 1$. We experienced professional working methods such as ADRs, hierarchical configuration management, and transparent documentation of the development process.

Academic Integrity Declaration

I/We hereby declare that:

Our self-evaluation is honest and truthful.

We have checked the work against all criteria before determining the grade.

We are aware that a high self-assigned grade will lead to more meticulous evaluation.

We accept that the final grade may differ from the self-assigned grade.

This work is the product of our effort and we are responsible for all content.

Signatures:

Tom Ron

Igor Nazarenko

Roie Gilad

Date: November 13, 2025