**Sprint-2**

**Introduction**

In this Sprint, the purpose was to create Graph builder, compute N day rolling pearson correlations and add a teacher GNN. The following sections contain the user stories I worked on with a detailed description of the tasks I worked on:

**User Stories**

I worked on the following User Stories:

[**GNN: DishFT-GNN: Future-Aware Distillation GNN #595**](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595)

**Conditions of Satisfiability:**

* Correctness: Adjacency shapes and edge thresholds are validated.
* Performance: Teacher & student training complete without errors; student inference meets latency target.
* Robustness: Pipeline handles missing days or low-volatility periods gracefully.
* Integration: Crew AI agent consistently applies probability rules to emit valid recommendations.

**Definition of Done:**

* Price data loader and returns matrix are implemented and tested.
* Correlation-based graph builder produces correct adjacency tensors.
* Teacher GNN architecture, training loop, and checkpoints are in place.
* Student GNN with distillation loss trains and is serialized.
* Inference script loads student model and emits the required JSON.
* Crew AI decision agent is configured and returns correct BUY/SELL/HOLD payload.
* End-to-end integration test passes under performance requirements.

**Tasks**

[GNN.1 Price & Returns Ingestion (8 ph) #596](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/596)

[GNN.2 Graph Construction (9 ph) #615](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/615)

[GNN.3 Teacher GNN Development (9 ph) #713](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/713)

[GNN.4 Student GNN & Distillation (7 ph) #714](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/714)

[GNN.5 Inference Wrapper (6 ph) #715](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/715)

[GNN.6 Crew AI Integration (4 ph) #716](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/716)

[GNN.7 Validation & Testing (7 ph) #717](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/717)

[GNN.8 Backtesting & Evaluation (11 ph) #718](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/718)

**Tasks I Worked On**

[GNN.2 Graph Construction (9 ph) #615](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/615)

I introduced the GraphBuilderAgent to process the daily returns DataFrame by computing N-day rolling Pearson correlations, thresholding them at |corr| > θ to generate adjacency matrices, and saving each date’s adjacency in both .npy and .pt formats. The task was estimated at 9 person hours but it took me 16 person hours to complete.

[GNN.3 Teacher GNN Development (9 ph) #713](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/713)

I added TeacherGNN, a temporal graph model combining a GCN layer per time step with a GRU over t+Δ windows and a final classifier.The task was estimated at 9 person hours but it took me 18 person hours to complete.

**Summary Table of Work**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| UserStory GitHub Issue ID | User Story | Story Points | Task GitHub Issue ID | Task | Task Hours | Status | Actual Hours |
| [GNN](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595) | [DishFT-GNN: Future-Aware Distillation GNN #595](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595) |  | [GNN.2](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/615) | Graph Construction (9 ph) #615 | 9 | Complete | 16 |
| [GNN](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595) | [DishFT-GNN: Future-Aware Distillation GNN #595](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595) |  | [GNN.3](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/713) | Teacher GNN Development (9 ph) #713 | 9 | Complete | 18 |

**Summary Table of Commits**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Commit Number | Commit Description (exactly as in github) | User Story | Task |
| June 22nd, 2025 | b9f97df5f0907e0da59b0251811e8d6db09dcd33 | [Add Graph construction and Teacher GNN training code](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/pull/765/commits/b9f97df5f0907e0da59b0251811e8d6db09dcd33) | [GNN](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/595) | [GNN.2](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/615)  [GNN.3](https://github.com/Rivier-Computer-Science/AI-Agent-Stock-Prediction/issues/713) |