

Project Progress Report

(Group – 04)

Week 2: June 18 – June 25, 2025

1. Project Structure Implementation

During this week, we successfully implemented the foundational project structure as per the provided guidelines. This structure organizes datasets, models, training logic, and evaluation methods into a clean, modular format, enabling easier scalability and maintenance throughout the project.

2. Command-Line Integration & Testing

We validated the core functionality of the command-line interface (CLI). A successful test run of the print function was completed using:

```
python ./codeP/main.py --dataset datasetName --model modelName --otherOptions  
OtherOptionsName --message "$1"
```

This confirmed the proper setup of argument parsing and dynamic input handling from the user side.

3. Implementation of Basic GCN Model

We implemented a basic Graph Convolutional Network (GCN) model and trained it on a sample dataset. The model setup included:

- Graph construction with node features and edge connections
- Forward pass with layer-wise propagation
- Loss function and optimizer for training

Initial experiments confirmed the model's ability to learn node-level representations effectively.

4. Bipartite Graph Construction and Analysis

We explored the concept of Bipartite Graphs:

- Constructed a bipartite graph based on manually defined interactions between two distinct node sets.
- Integrated the bipartite graph with the existing GCN model.
- Used the Cora dataset to train the model on this structure.
- Performed link prediction based on the learned embeddings from the GCN.

Summary

The third week marks significant foundational progress:

- Core system structure and input mechanisms are in place.
- A basic yet functional GCN model is ready.
- Experiments with bipartite graphs show potential for more complex relational modeling.