CSCN8010: Applied AI & Machine Learning

Job Interview Guide Workshop

👥 Group 2 Information

- **Ali Cihan Ozdemir** (Student ID: 9091405)
- **Lohith Reddy Danda** (Student ID: 9054470)

> ⚠️ **Important Notice:** Group member Roshan did not attend the laboratory session, did not participate in the development, and provided zero contribution to this project.

🔗 GitHub Repository Link

https://github.com/alicih4n/JobInterviewGuide_Workshop.git

(All deliverables, including code, simulation transcripts, and visualizations, are hosted in this repository branch.)

📄 Executive Summary

For this workshop, we programmatically simulated a complete, interactive 15-question technical interview using an LLM. The assessment evaluated our mastery of core machine learning architecture, focusing on Train/Validation splits, Linear and Logistic Regression metrics (R^2 vs Cross-Entropy), identifying proper decision boundaries in Decision Trees, and K-Nearest Neighbors hyperparameter optimization.

During the session, the simulation successfully identified a specific knowledge gap regarding **Data Leakage**—specifically, the danger of fitting scalers on an entire dataset before partitioning it, which artificially boosts metrics during validation.

To address this, we completed a robust, heavily commented Python Jupyter Notebook utilizing `scikit-learn`. We built strict, leak-proof Machine Learning instances utilizing `Pipeline`, verified homoscedasticity computationally by charting linear residuals with `seaborn`, and mapped clear accuracy performance distributions under changing hyperparameter loads. We ensured all final implementations are PEP8-compliant and natively accessible via our project repository.