Appendix A

Major Project 21CSA699A

Proposal (Individual Mode)

Title: Advanced HR Analytics: Workforce Performance Prediction

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Address of the Company:

Name, Designation and Communication details of the Guide:

(if the student chooses 'industry integration'):

Abstract

This project focuses on building a machine learning-based system for predicting high-performing employees using multi-source HR data, including attendance, recruitment source, training completion, performance metrics, and engagement scores. The goal is to identify key factors influencing workforce performance and to provide actionable insights for improving hiring, retention, and productivity. The system leverages Python's scikit-learn for classification modeling, feature selection tools for identifying impactful variables, and visualization libraries for model explainability.

Assumptions/Declarations:

1. All HR datasets are anonymized and compliant with data privacy policies. 2. The project uses synthetic or sample data modeled after industry formats for demonstration purposes. 3. The predictive model serves as a decision-support tool, not a direct employee evaluation mechanism.

Main Objective/Deliverable:

To design and implement a workforce performance prediction model using historical HR data that identifies potential high performers early, enabling data-driven workforce planning and optimized recruitment.

Timeline and Milestones:

	Milestones	Timeline
1.	Problem definition and domain understanding	Week 1

Tools to be used.

Software/Hardware Tools	Specifications
Python, scikit-learn, Pandas, NumPy, Matplotlib, Seaborn, Power BI, Google Colab / Jupyter Notebook, Excel	Machine learning model development, Data processing, Data visualization and dashboarding, Project implementation, HR dataset collection and manipulation

Learning involved:

Topic	Description
HR Analytics, Feature Engineering, Machine Learning, Data Visualization, Workforce Planning	Deriving insights from employee-related data for strategic decisions, Identifying and transforming variables that impact employee performance, Applying predictive analytics to optimize staffing and retention strategies

Date 10/17/2025

Student Name and Signature Neeraj Suresh