Employee Attrition Prediction and Analysis

1. Project Planning & Management

Overview:
This project aims to analyze employee attrition using data science techniques. By leveraging machine learning and statistical analysis, we seek to identify key factors influencing employee turnover and provide actionable insights to improve retention strategies.

Objectives:
- Identify patterns and trends in employee attrition.
- Develop predictive models to estimate the likelihood of employee turnover.
- Provide data-driven recommendations to HR teams.

Scope:
- Data preprocessing and exploration.
- Application of machine learning models.
- Evaluation of model performance.
- Interpretation of results and recommendations.

2. Project Plan

Timeline & Milestones:

Task	Duration
Data Collection & Cleaning	2 Weeks
Exploratory Data Analysis (EDA)	2 Weeks
Model Development	3 Weeks
Model Evaluation & Optimization	2 Weeks

Deliverables:
- Cleaned dataset.
- EDA report.
- Machine learning models.
- Final report with insights and recommendations.

3. Task Assignment & Roles

Name	Responsibility
Ziad Sami Ismail	Data collection, preprocessing, and deployment
Mahmoud Ali Ali	Model development and evaluation
Ahmed Mohamed Ahmed	Exploratory data analysis and visualization
Youssef Yasser Mohammed	Coordination, timeline management, and reporting

4. Risk Assessment & Mitigation Plan

Risk	Mitigation Strategy
Data Quality Issues	Implement data validation and cleaning procedures.
Model Overfitting	Use cross-validation and regularization techniques.
Lack of Interpretability	Employ explainable AI techniques and feature importance analysis.
Computational Limitations	Optimize model efficiency and use cloud computing if needed.

5. Key Performance Indicators (KPIs)

KPI	Measurement
Model Accuracy	Precision, recall, F1-score of predictive models.
Data Completeness	Percentage of missing values in the dataset.
Retention Rate	Percentage of employees retained post-intervention.
Processing Time	Time is taken for data processing and model training.