

Supervised ML (Assignment2)

Assignment Project

Problem Statement

A multinational company **TalentCore Pvt. Ltd.** has been experiencing a rising number of employee resignations, which increases recruitment cost, project delays, and loss of skilled talent.

The HR department wants to build an **intelligent ML system** that can **predict whether an employee is likely to leave the company** based on job satisfaction, salary, age, work-life balance, training hours, bonuses, and other work-related factors.

You are hired as a **AI/ML Engineer** to:

1. Build a **baseline Logistic Regression model**
2. Improve it using **Regularization (L1 & L2)**
3. Compare their performances and recommend the best model.

Dataset Description

The Employee dataset has 900 rows and 15 columns (features), representing various employee metrics. This dataset aims to reflect realistic scenarios in a corporate settings.

Following is a brief overview of the dataset:

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Feature	Description
Job_Satisfaction	Level of satisfaction with the job
Performance_Rating	Employee performance score
Years_At_Company	Number of years worked in company
Work_Life_Balance	Balance between work and personal life
Distance_From_Home	Distance of home from workplace
Monthly_Income	Monthly salary
Education_Level	Education qualification level
Age	Age of employee
Num_Companies_Worked	Number of companies worked previously
Employee_Role	Encoded job role
Annual_Bonus	Bonus received annually
Training_Hours	Training hours attended
Department	Encoded department
Annual_Bonus_Squared	Engineered feature (bonus^2)
Annual_Bonus_Training_Hours_Interaction	Interaction feature between annual bonus and training hours.
Employee_Turnover (Target)	1 = Employee Left, 0 = Stayed