EMPLOYEE ATTRITION PREDICTION WEB APPLICATION

Using Machine Learning to Predict Employee Turnover

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INTRODUCTION

- Objective: Predict whether an employee is likely to leave the company.
- Key Features:
  - FastAPI backend for predictions
  - Streamlit frontend for user interaction
  - High model accuracy of 98.83%

PROBLEM STATEMENT

- Challenge: Employee attrition is costly and disruptive.
- Goal: Develop a predictive model to help companies proactively manage employee retention.

DATASET OVERVIEW

- Source: Employee Attrition Dataset
- Key Features:
  - Satisfaction level
  - Last evaluation
  - Number of projects
  - Average monthly hours
  - Time spent at the company
  - Department, Salary, etc.

MODEL SELECTION

- Chosen Model: RandomForestClassifier
- Reason: High accuracy and robust performance on a variety of data types.
- Evaluation: Achieved an accuracy of 98.83% on the test set.

DATA PREPROCESSING

- Steps Involved:
  - Handling categorical variables (Label Encoding)
  - Feature selection
  - Splitting data into training and testing sets

- Tools: Pandas, Scikit-learn

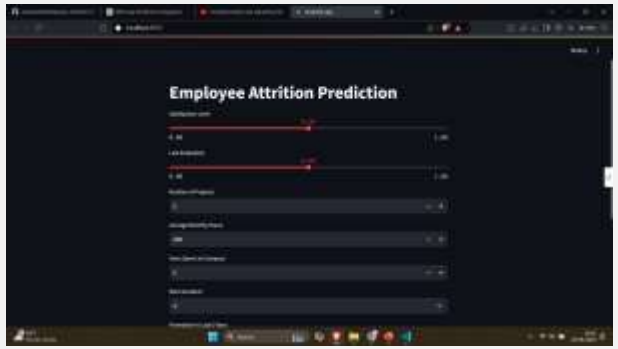
WEB APPLICATION ARCHITECTURE

- Components:
  - **FastAPI:** Backend API for handling predictions.
  - **Streamlit:** Frontend interface for user interaction.

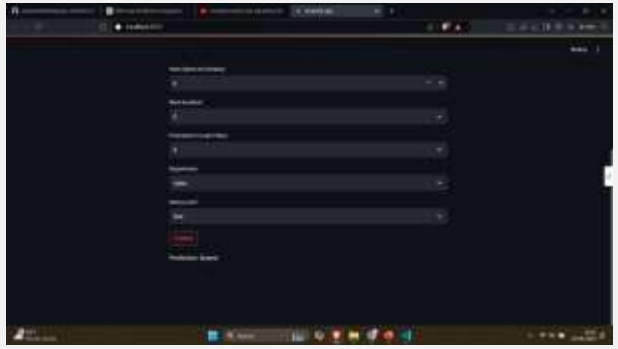
- Workflow:
  - User inputs employee data via Streamlit.
  - Data is sent to FastAPI for prediction.
  - Result is displayed back to the user.

DEMO

- Screenshots:
  - Input form on Streamlit



  - Prediction output



CONCLUSION

- **Outcome:** Successfully built a web application with high accuracy.
- **Impact:** Can be used by HR departments to identify employees at risk of leaving.
- **Future Work:** Explore additional features, improve the model, and deploy on cloud platforms.

Q&A

Any questions or feedback?