Customer Satisfaction Prediction Project

# Project Description

This project focuses on predicting customer satisfaction using Machine Learning techniques on a dataset containing customer support ticket data. It utilizes tools such as Python, SQL, and Excel to perform Data Cleaning, EDA, Feature Engineering, and Model Building for accurate predictions.

# Tools and Technologies

Languages: Python, SQL, Excel

Libraries: pandas, numpy, seaborn, matplotlib, scikit-learn

Tools/Platforms: Jupyter Notebook, VS Code

ML Algorithm: Random Forest Classifier

# Dataset Overview

The dataset contains:  
- Ticket ID, Customer Name, Age, Gender, Email  
- Product Purchased and Date  
- Ticket Type, Description, Subject, Channel, Priority  
- Response Time, Resolution Time, and Customer Satisfaction Rating (1 to 5)

# Use Cases

- Predict Customer Satisfaction  
- Segment customers by behavior  
- Analyze ticket resolution time  
- Identify common complaints  
- Use NLP to classify or cluster ticket descriptions

# Steps Involved

1. Data Preprocessing: Handle nulls, encode categories, scale features  
2. EDA: Visualize data trends and outliers  
3. Feature Engineering: Create new meaningful variables  
4. Model Building: Random Forest Classifier  
5. Model Evaluation: Accuracy, Confusion Matrix, Feature Importance  
6. Visualization: Customer trends and insights

# Key Visualizations

- Line chart of ticket trends over time  
- Pie charts for gender, ticket type, priority  
- Histograms of satisfaction and age  
- Bar charts of top issues and products purchased  
- Facet grid of ticket type by age distribution

# Sample Code Snippet

from sklearn.ensemble import RandomForestClassifier  
rfc = RandomForestClassifier(random\_state=42)  
rfc.fit(X\_train, y\_train)  
y\_pred = rfc.predict(X\_test)  
print("Accuracy:", accuracy\_score(y\_test, y\_pred))

# References

Dataset: https://drive.google.com/file/d/1DRdLKOinSNuoMwVyFGH86f3xEhkZMrz6/view?usp=sharing

GitHub Inspiration: https://github.com/praveen-hegde/E-commerce-customer-satisfaction-predicton

# Summary

The project provides a comprehensive analysis of customer service data and builds a predictive model for customer satisfaction. It showcases practical implementation of machine learning and data analysis techniques to drive business insights and improve customer service quality.