Flight Ticket Price Predictor Using Machine Learning

Overview

This project introduces a machine learning-based system to predict flight ticket prices by analyzing key factors that influence airfare trends. The aim is to create a user-friendly platform that helps travelers plan their trips cost-effectively.

1. Understanding Key Factors:

- Examines elements affecting flight ticket prices such as locations, travel dates, airlines, seasonaltrends, and route popularity.
- Integrates market situations and customer behavior data for accurate predictions.

2. Utilization of Machine Learning Models:

- Algorithms used:
- Linear Regression, Random Forest, XGBoost, SVM, and Neural Networks.

3. Programming Implementation:

- Implemented in Python using Pandas, Scikit-learn, TensorFlow, and XGBoost.
- Sample Code: ```python import pandas as pd from sklearn.model_selection import train_test_split from sklearn.ensemble import RandomForestRegressor

df = pd.read_csv("flight_prices.csv")

X = df[["airline", "departure", "arrival", "duration", "stops", "date"]]

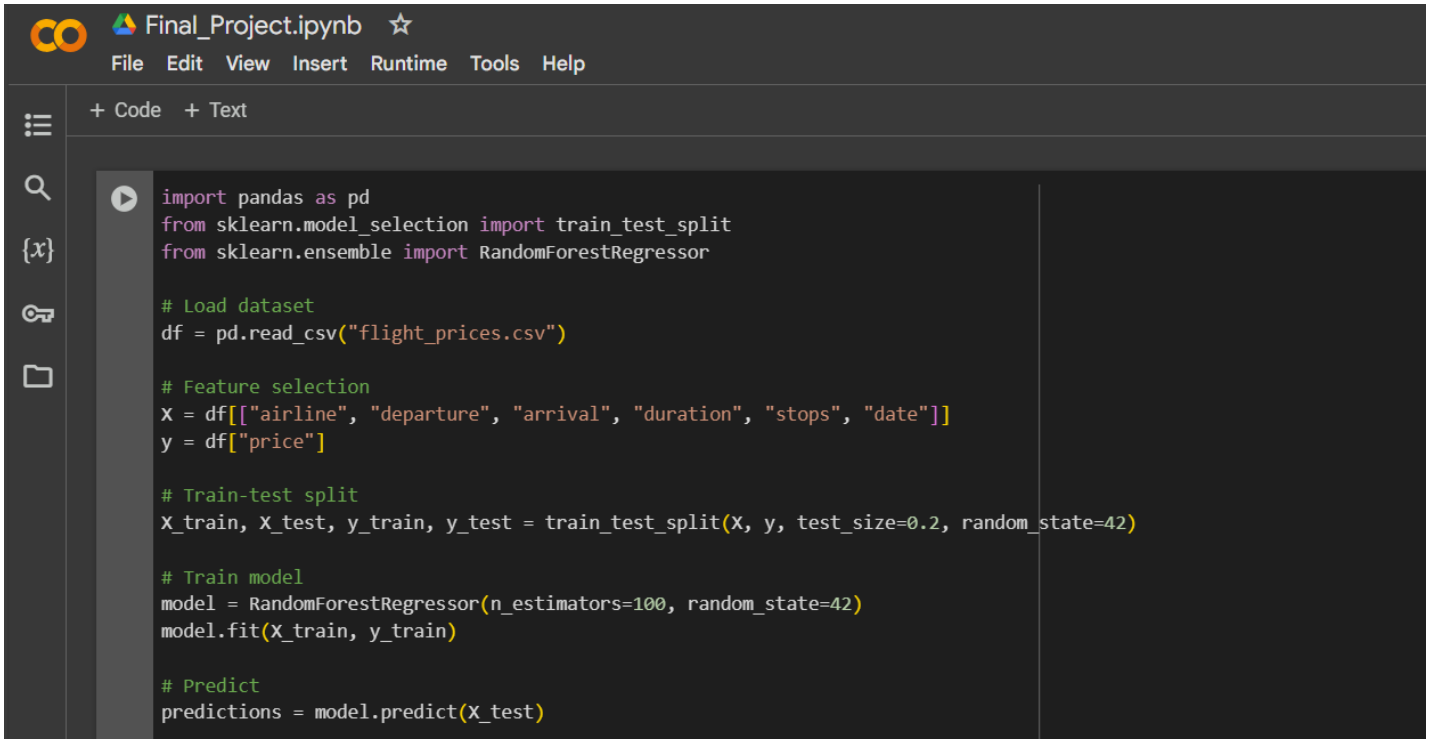
y = df["price"]

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

model = RandomForestRegressor(n_estimators=100, random_state=42)

model.fit(X_train, y_train)

predictions = model.predict(X_test)



4. Dataset Description:

- Includes flight price records with details like airline name, departure/arrival locations, flightduration, number of stops, travel dates, and seasonal indicators.
- Datasets used:
- Kaggle Flight Price Dataset
- OpenSky Network Data
- Airline APIs (Skyscanner, Amadeus)

5. Prediction Approach:

- Data preprocessing includes handling missing values, encoding variables, and feature scaling.
- Model training using cross-validation for performance optimization.
- Predicts ticket prices based on input features, with ensemble techniques enhancing accuracy.

6. Practical Benefits for Users:

- Provides insights on the best times to book flights and save money.
- Adapts to market changes for real-time accuracy and reliability.

7. Expected Outcomes:

- Fast and reliable price predictions using advanced data analysis.
- Improved user experience through a user-friendly interface.