Overview of the Flight Ticket Price Predictor Project

Key Features of the Project:

1. **Goals**:

   o Use machine learning to predict future flight ticket prices by analyzing factors like departure location, airline services, routes, and seasonal trends.

   o Compare multiple machine learning models to identify the most accurate method for flight price prediction.

   o Build a user-friendly platform to help travelers book tickets at the best prices.

2. **Dataset**:

   o Includes flight price records, airline routes, and departure information.

   o Data sourced from major flight booking websites and airlines.

3. **Programming and Tools**:

   o **Languages and Platforms**: Python, Jupyter Notebook.

   o **Algorithms Used**: Linear Regression, Random Forest, XGBoost, Support Vector Machines (SVM), Neural Networks.

   o **Evaluation Metrics**: Accuracy, reliability, and adaptability to market changes.

Full Project Description

Abstract:

This project introduces a machine learning-based system for predicting flight ticket prices. Traditional methods that rely on static rules have limited success in understanding the complex dynamics of airline pricing. The proposed system reviews multiple factors, including departure location, airline services, route frequencies, travel dates, and seasonal trends. By learning from extensive flight price records and incorporating dynamic data, the system delivers improved prediction accuracy.

Objectives:

- **Price Prediction**: Develop a machine learning application to forecast flight ticket prices based on various influencing factors.

- **Adaptability**: Incorporate real-time market conditions and customer behavior to enhance forecasting accuracy.

- **Model Evaluation**: Compare machine learning models to identify the most effective for flight price prediction.

- **User Accessibility**: Provide a platform that helps users decide the best time to book tickets and save on travel expenses.

Dataset Description:

The dataset includes detailed flight price records, airline routes, and departure information, sourced from major booking platforms and airlines. This dataset enables the model to identify patterns and trends in ticket pricing.

Models/Algorithms:

1. **Linear Regression**: Forecasts flight rates using multiple contributing factors (Manibalan and Jothi, 2024).

2. **Random Forest**: Explores relationships between features and identifies non-linear connections.

3. **XGBoost**: Provides high-performance predictions for complex datasets.

4. **Support Vector Machines (SVM)**: Categorizes prices to enhance forecasting reliability.

5. **Neural Networks**: Identifies complex data relationships to improve trend predictions.

Expected Outcomes:

- **Fast and Accurate Predictions**: Provides reliable flight price estimates by analyzing market demand trends and other factors (Guan, 2024).

- **Adaptability**: Models remain accurate by adapting to current market conditions.

- **User Benefits**: The platform allows travelers to identify optimal booking times and manage travel costs effectively.

References:

- Manibalan, B., and Jothi, J.A.A., 2024, April. Airline Customer Reviews Analysis and Booking Completion Prediction using Data Visualization and Machine Learning for

British Airways. In *2024 International Conference on Emerging Technologies in Computer Science for Interdisciplinary Applications (ICETCS)* (pp. 1-6). IEEE.

- Guan, Y., 2024. Flight Price Prediction Web-Based Platform: Leveraging Generative AI for Real-Time Airfare Forecasting. *Journal of Web Engineering*, 23(2), pp.299-314.