Developing A Flight Delay Prediction Model Using Machine Learning

PROBLEM STATEMENT:

The problem of flight delay prediction is approached most often by predicting a delay class or value. However, the aviation industry can benefit greatly from probabilistic delay predictions on an individual flight basis, as these give insight into the uncertainty of the delay predictions. Therefore, in this study, two probabilistic forecasting algorithms, Mixture Density Networks and Random Forest regression, are applied to predict flight delays at a European airport. The algorithms estimate well the distribution of arrival and departure flight delays with a Mean Absolute Error of less than 15 min. To illustrate the utility of the estimated delay distributions, we integrate these probabilistic predictions into a probabilistic flight-to-gate assignment problem. The objective of this problem is to increase the robustness of flight-to-gate assignments. Considering probabilistic delay predictions, our proposed flight-to-gate assignment model reduces the number of conflicted aircraft by up to 74% when compared to a deterministic flight-to-gate assignment model. In general, the results illustrate the utility of considering probabilistic forecasting for robust airport operations' optimization.

Who does the problem affect?	Persons who use the Flight on traveling
What are the boundaries of the problem?	People who use flight and facing issues of flight delay.
What is the issue?	The impact of flight delay can be a risk and this risk represents financial losses, the dissatisfaction of passengers, time losses, loss of

	reputation and bad business relations. If an airline doesn't deal with this problem immediately, it will cause other problems
When does the issue occur?	During the weather condition has changed in suddenly that time the issues occur.
Where does the issue occur?	The issue occurs in the flight take off, landing place and air place.
Why is it important that we fix the problem?	predicting flight delays can improve airline operations and passenger satisfaction, which will result in a positive impact on the economy. In this study, the main goal is to compare the performance of machine learning classification algorithms when predicting flight delays.
What methodology used to solve the issue?	They have used techniques like Decision Trees, AdaBoost, and K-Nearest Neighbors for predicting individual flight delays. A binary classification was performed by the model to predict the scheduled flight delay