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Project 2 Forecasting

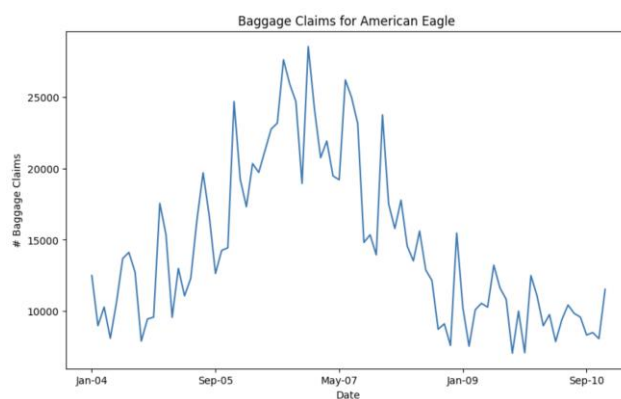Airlines Analysis & Executive Summary

Performance and Reputation:

The performance and reputation of airlines largely depend on baggage claims and canceled flights. United Airlines and American Eagle Airlines need to address these issues as they aim to turn data into insights and reduce the number of canceled flights and baggage claims. This process involves forecasting, making predictions, and providing recommendations.

Data Overview:

We analyzed data comprising 252 rows and 8 columns with no missing values. This data includes United, American Eagle, and Hawaiian Airlines. The columns are: Airline, Date, Month, Year, Baggage claims, Total scheduled flights, Total canceled flights, and Total passengers. Notably, the Month and Year are crucial as they define time series data, which involves repeated measurements over equally spaced time intervals.
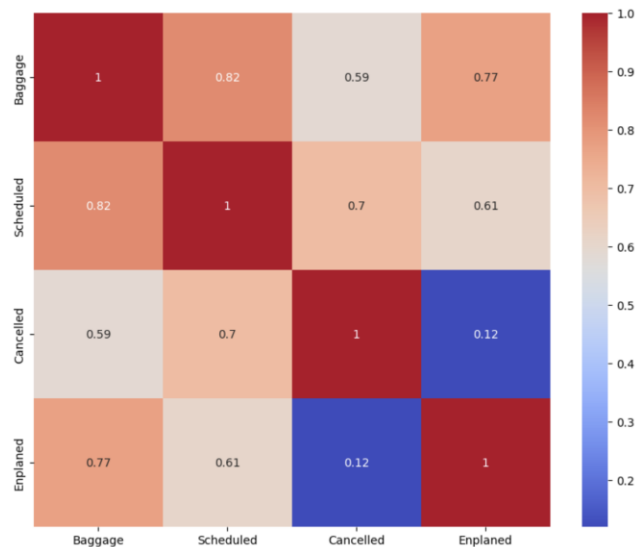
Time Series Data:

Time series data is a collection of observations taken over time. In this case, the data is collected monthly. We've created line plots to visualize this data.

Factors:

Our goal is to predict baggage claims and canceled flights. To understand these variables, we used a correlation matrix. It helps us see how different factors relate to each other. Positive or negative correlations indicate how changes in one variable affect another. For example, baggage claims tend to increase with scheduled, canceled, and enplaned flights. Canceled flights show a positive relationship with baggage and scheduled flights but a weak negative relationship with enplaned passengers.
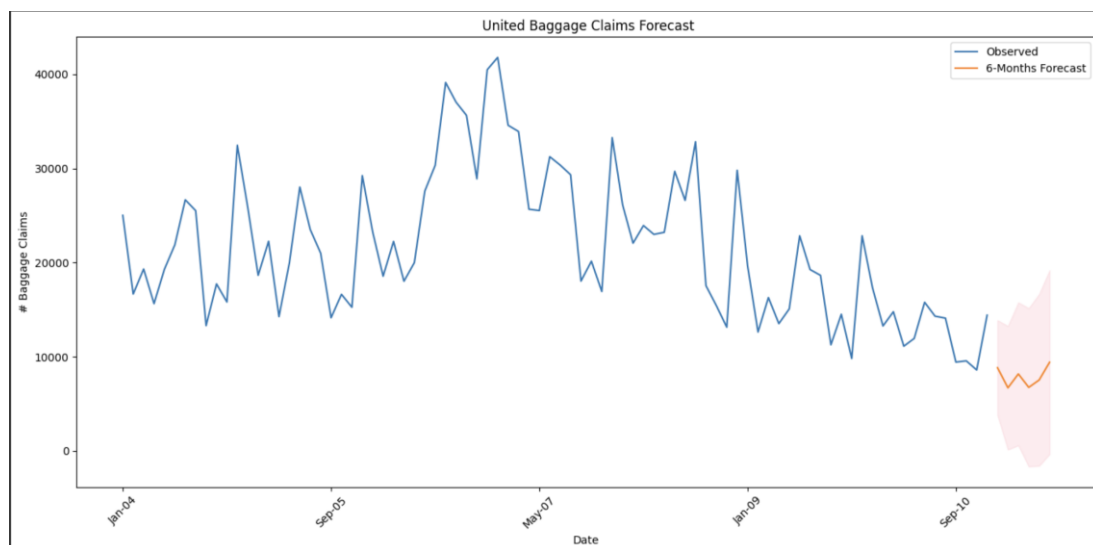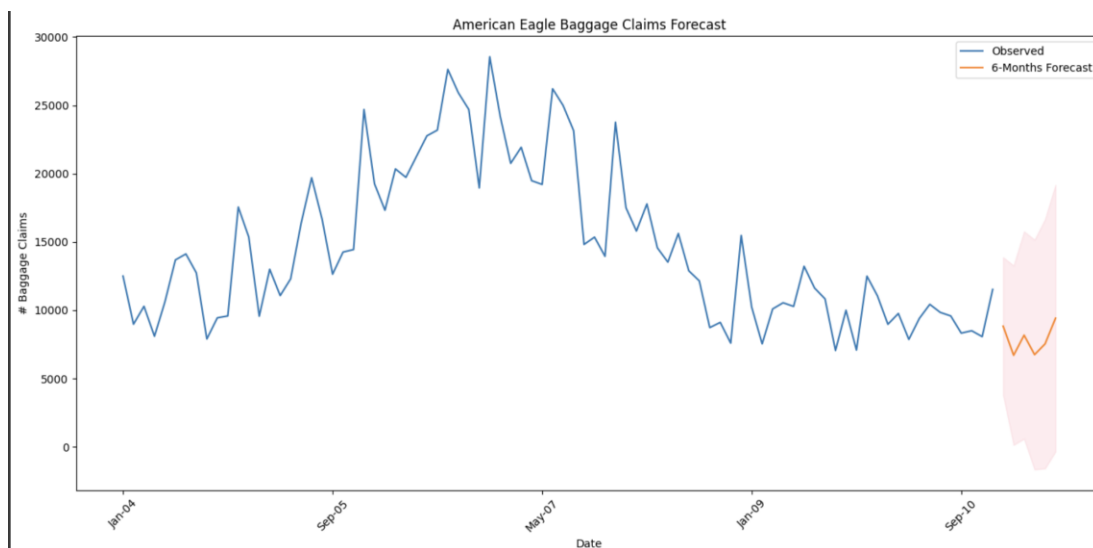

6-Month Forecast:

We aimed to predict baggage claims and canceled flights for the next 6 months. However, it's important to note that the farther in the future we predict, the less accurate the forecast becomes. To evaluate the quality of a forecast, we look for low errors, randomness in residuals, and statistical significance in model variables.

American Eagle Airlines vs United Airlines

American Eagle Airlines has a more accurate baggage claims forecast, while United Airlines struggles. American Eagle's forecast suggests a possible upward trend in baggage claims, whereas United Airlines predicts a decrease.
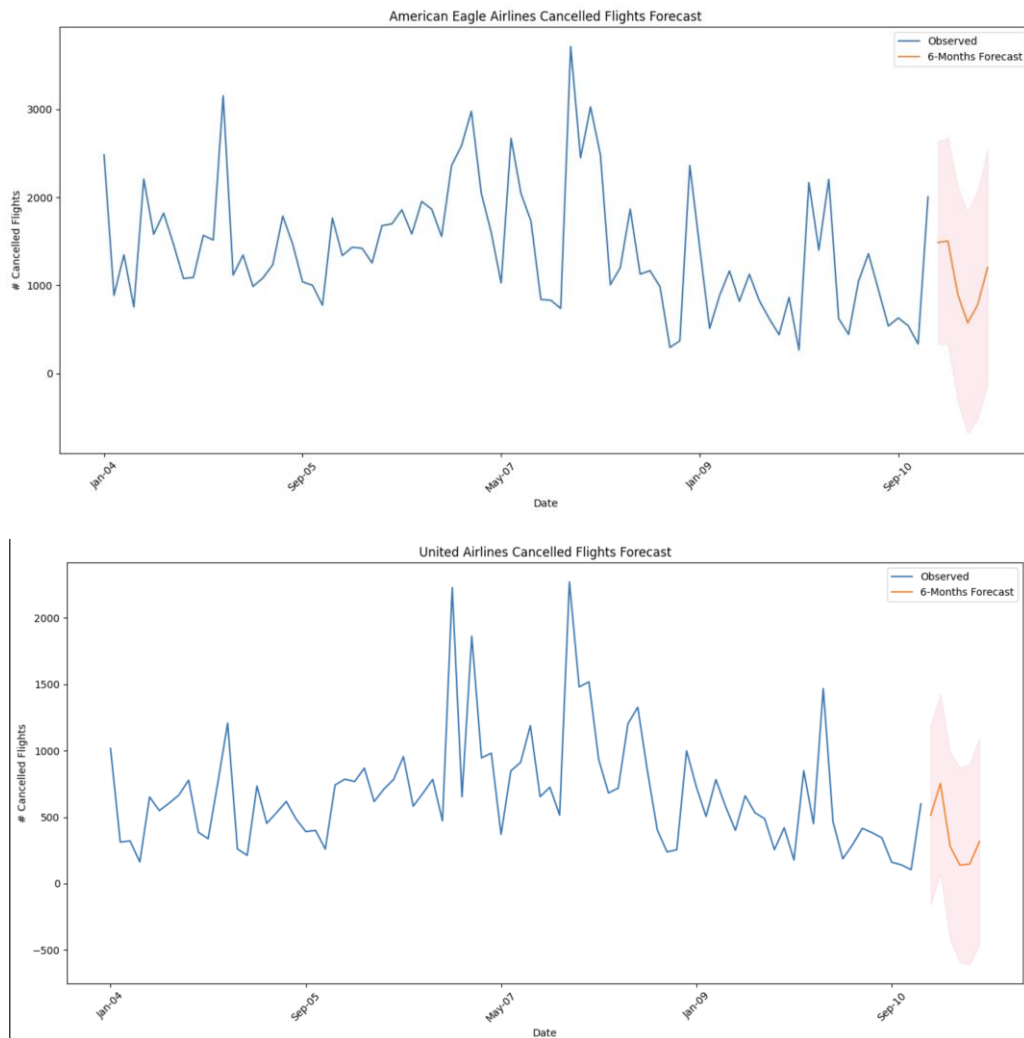
Down below You see that will find that American Eagle Airlines has a solid fit for predicting the number of baggage claims for the next 6 months, while United Airlines seems to struggle. Also, American Eagle

has slightly lower error than United Airlines. Also, American Eagle has the orange band around the orange line allows to state that we are 95% confident that the true value of baggage claims can take place between the lower bound and upper bound of the orange band. Now, since the orange band covers the higher part of the blue line this means that our forecast suggests the possibility of a upwards trend of baggage claims in the next 6 months which is accurate as Jan 2004 to September 2005 shows that there is a upwards trend of baggage claims. United airlines suggest there will be a decrease and its orange band does not cover much area like American Eagle, so we stand that American Eagle Airlines has a more accurate and stronger forecast.

For canceled flights, United Airlines has a more accurate forecast compared to American Eagle Airlines, especially between January 2004 and September 2005.

Down below, you will find that United Airlines has a solid fit for predicting the number of baggage claims for the next 6 months, while American Eagle seems to struggle especially with the orange line. United Airlines' best prediction (orange line) is the closest to the blue and best represents the behavior of the original data especially in the time between January 2004 and September 2005 where there is a peak and then drops. While for American Eagle airlines, the shape of the orange line does not really replicate well or predict well the behavior of the time between January 2004 and September 2005 with the peaks and drops. Hence, we believe that United Airlines has a more accurate and stronger forecast.

Recommendations:

- American Eagle Airlines: Expect a decrease in baggage claims and consider a 3-month or shorter forecast for canceled flights due to a high error rate.

- United Airlines: Anticipate a drop in baggage claims over the next six months and a peak followed by a decrease in canceled flights.

In summary, consider booking with American Eagle Airlines within the next 2-3 months for fewer canceled flights. For United Airlines, bookings in the next 2-6 months should result in fewer canceled flights. Additionally, American Eagle Airlines seems to offer a more reliable baggage claim forecast.