Unlocking Air Travel Potential: A Strategic Approach to Airline Optimization

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1. Introduction

1.1 Project Overview

One of the most popular forms of travel in the United States by plane. Each day there are more than 45,000 flights and nearly 2.9 million airline passengers, according to the Federal Aviation Administration ("Air Traffic by the Numbers"). There are many factors that can influence the number of flights going out and the number of flights cancelled, such as weather conditions, mechanical issues, seasonal patterns, and staffing shortages. According to the Department of Transportation, an average of 2.3% of flights are cancelled each year, with a record 7.2% of flights being cancelled amidst the pandemic in 2020 which dropped to 1.7% by 2021 ("2024 Flight Cancellation Rate"). This project aims to enhance airline operational efficiency by identifying and analyzing flight patterns. The first area of analysis included an exploration of a larger airline, Delta, with a smaller airline, Spirit. According to Delta Airways, "There are 100,000 Delta people leading the way to deliver a world-class customer experience on up to 5,000 daily flights to more than 290 destinations on six continents" (Delta News Hub). Alternatively, Allegiant airlines employs about 5,900 people and departs from 117 airports in the United States (Allegiant Air). The goal of this analysis is to compare the operations of a smaller and larger airline and pinpoint any discrepancies or areas to work on. The next area of analysis is to look at the geographical flight data. The goal of this portion of the analysis is to explore flight routes, distances, and specific airport locations to see how they may impact cancellation rates and delays. Finally, we would like to compare the flight patterns between 2020, during the Pandemic, with 2021, immediately post-Pandemic. By examining these variables, this project seeks to provide actionable insights that can help airlines improve operational efficiency, minimize delays, and enhance the overall travel experience for passengers in both the short and long term.

1.2 Dataset Overview

The Flights Status dataset, provided by Rob Mulla on Kaggle, was extracted from the U.S. Department of Transportation's TranStats data library (Mulla). It contains 61 features and 6,311,871 observations, offering comprehensive data on various aspects of air travel in the year 2021 and 2020. These features are categorized into four groups: airline information, including airlines, airports, and departures/arrivals; delays and cancellations, such as delay durations and cancellation indications; reasons for delays, covering causes like carrier issues, weather, security, or aircraft; and time, detailing the quarter, month, day, and flight date. This dataset provides a comprehensive overview of flight information with a very large sample size, making it suitable for use in this analysis.

1.3 Predictions, Inference, and Goals

The goal of this project is to identify patterns in flight operations that affect cancellations and delays, with a particular focus on comparing the performance of large and small airlines. By

analyzing geographical data and flight routes, we aim to determine the impact of various factors such as distance and airport location on operational efficiency. We predict that the pandemic will have a noticeable effect on flight patterns, particularly in terms of delays and cancellations. Ultimately, the findings will inform strategies to improve airline performance and the passenger experience.

2. Data Exploration

The "Flight Status Prediction" dataset was initially explored to get a sense of the distribution of the variables. In Figure 1, the distribution of the number of flights based on the airline is plotted. This plot shows that the top 5 airlines with the most flights in 2021, with more than 600,000 flights each, are: Southwest, SkyWest, Delta, American Airlines, and United. Some of the smaller airlines, with less than 200,000 flights each, included: Allegiant, Hawaiian Airlines, and Empire Airlines. Next, we sought to get a better understanding of the total flights and delayed flights. Figure 2 illustrates the total number of flights and number of delayed flights broken down by the quarter of the year. The plot shows that the majority of flights went out in the third quarter and least went out in the first quarter. The delayed data was very similar to the total flights data in that the most delayed flights were in the 3rd quarter and the least delayed flights were in the first quarter.

Finally, we sought to learn more about the cancellations data by exploring some more distributions. In Figure 3, the number of cancellations were plotted based on month. There most cancellations in 2021 were observed in February, followed by August. The least number of cancellations in 2021 were in May followed by April. This data was interesting because there did not seem to be a clear pattern between the time of year and the number of cancelled flights. Next, the cancellation data was further explored in Figure 4, in which we plotted the number of cancelled flights based on the airline. Some of the airlines with the highest number of cancellations were actually some of the smaller airlines such as: Allegiant Air and Gojet Airlines. Similarly, some of the largest airlines had the smallest number of cancelled flights such as Delta Airlines. This data was very interesting to us because it suggested that there could be a strong influence between the airline and the number of cancellations. To further explore some potential key features, we also created a correlation matrix in Figure 5. This correlation matrix showed some strong correlations between variables such as distance, air time, and elapsed time, but ultimately not a lot of other strong correlations between features.

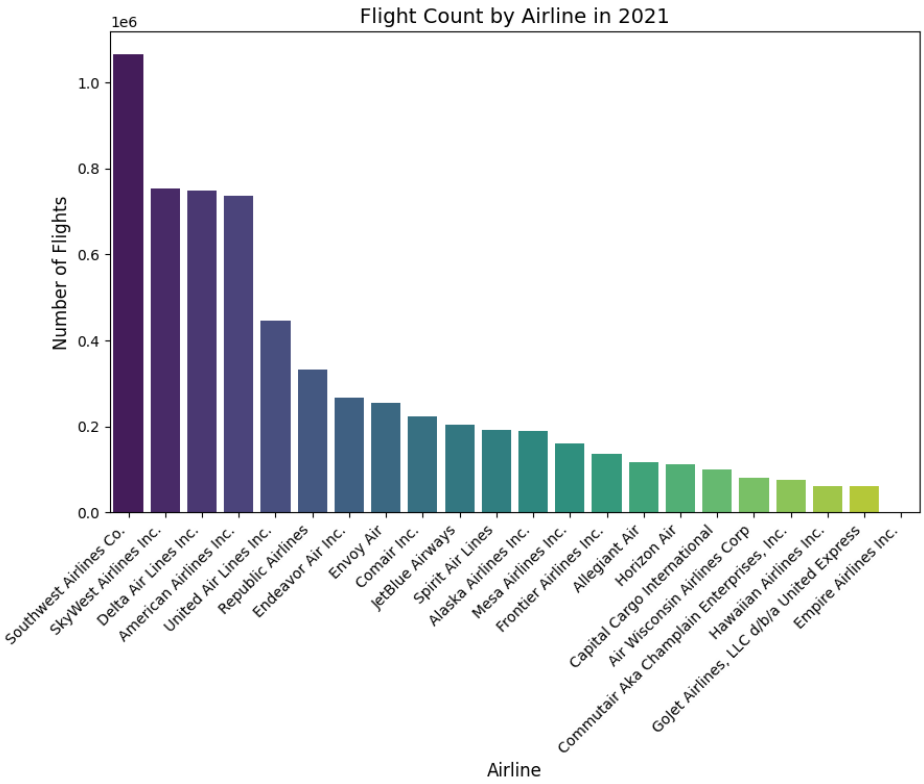

Figure 1: Number of Flights by Airline in 2021

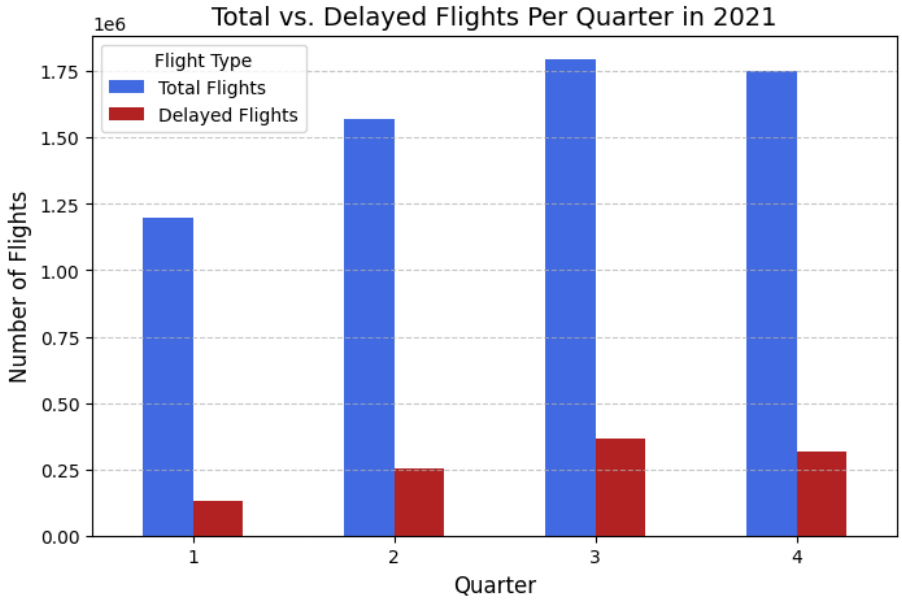

Figure 2: Number of Total Flights and Delayed Flights per Quarter in 2021

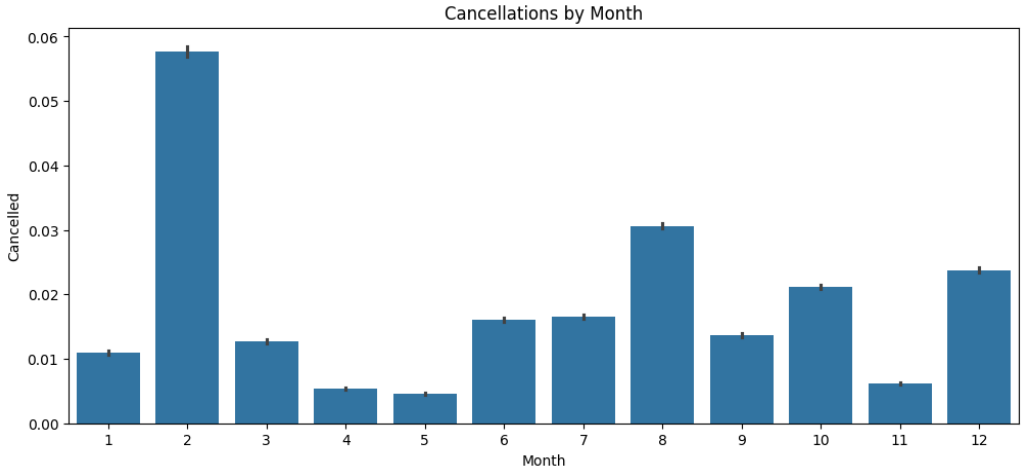

Figure 3: Cancellations by Month

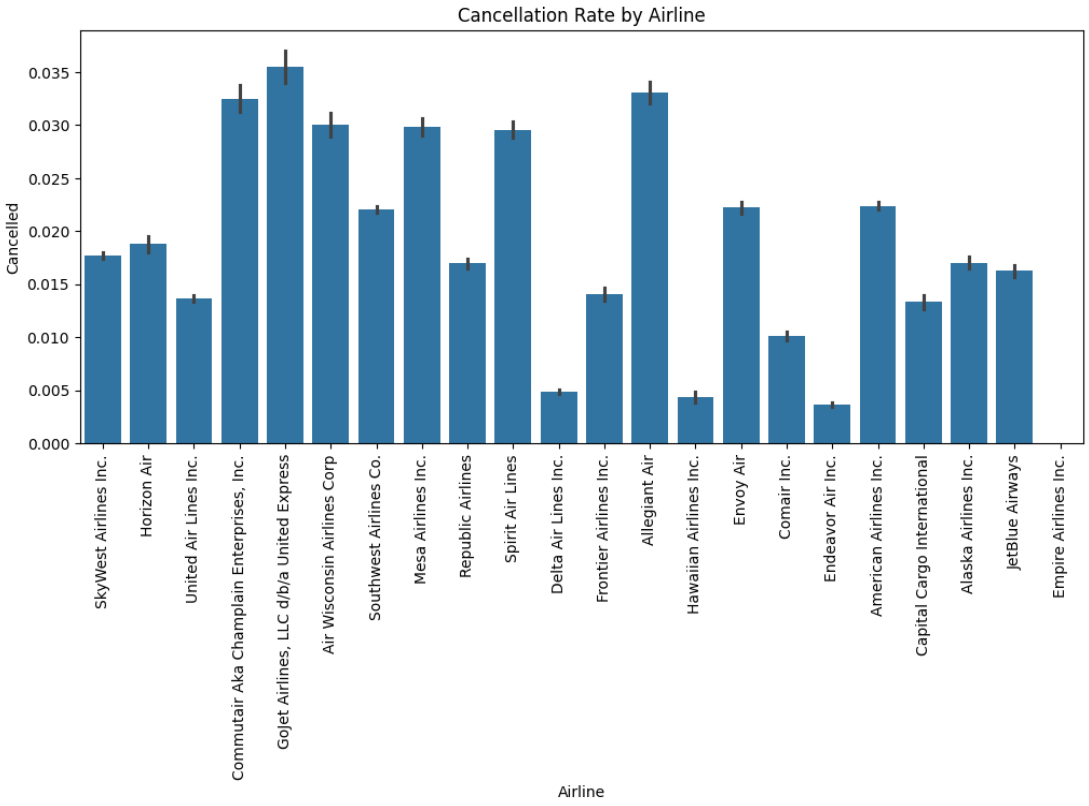

Figure 4: Cancellations by Airline

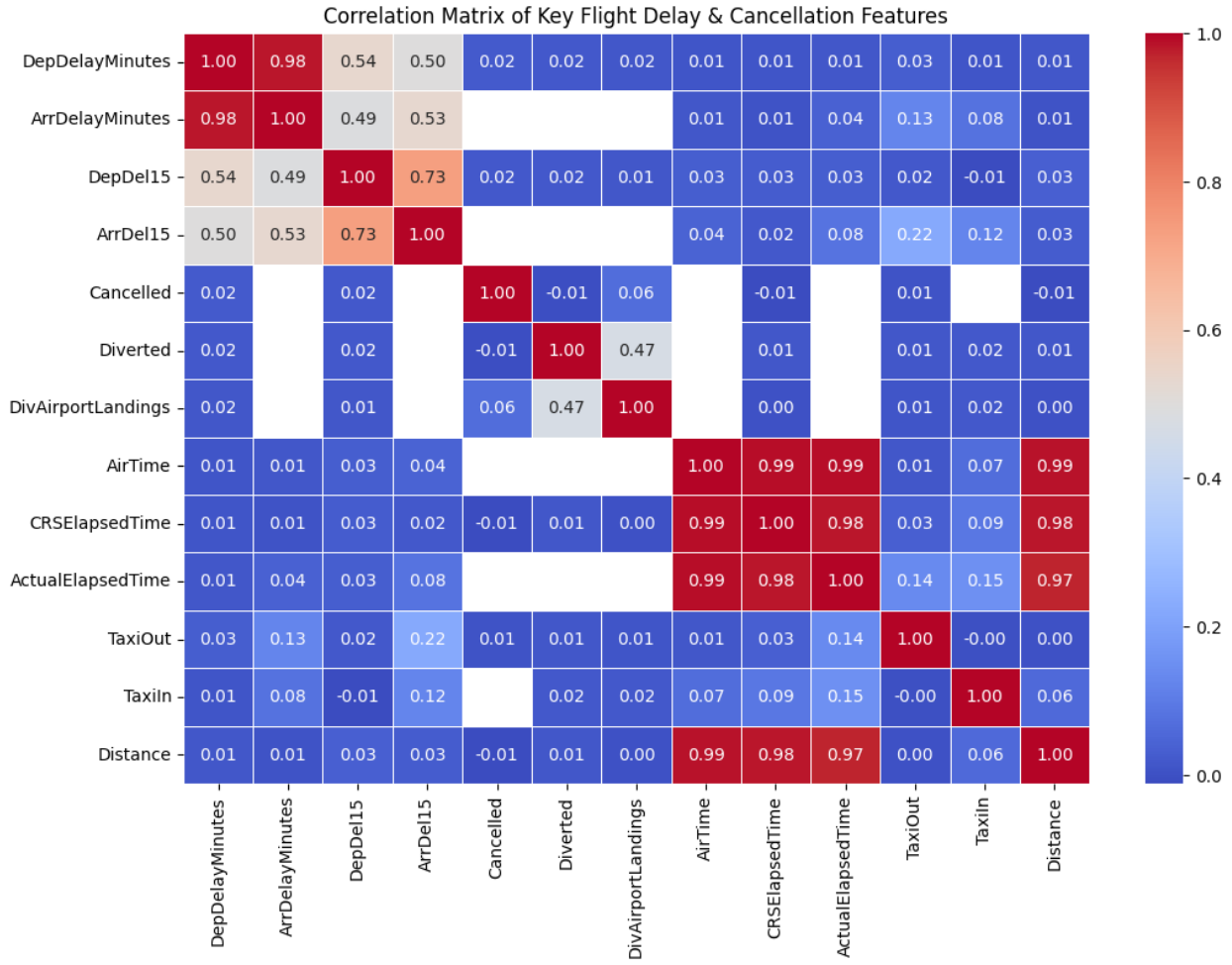

Figure 5: Correlation Matrix of Key Flight Delay and Cancellation Features

3. Methods

3.1 Comparison between Delta Air Lines and Allegiant Air

Problem Statement: Flight cancellations have a major impact on airline efficiency and passenger experience. This study compares two airlines — Allegiant Air, which has a relatively high cancellation rate, and Delta Air Lines, which maintains low cancellation rates. The goal is to understand what factors contribute to these differences and provide recommendations for reducing cancellations.

Methodology: We analyzed flight data from 2021, using a dataset with over 6 million flights. We focused our analysis on two airlines: Allegiant Air and Delta Air Lines Inc. We compared their

performance in terms of: overall cancellation rates, average departure delays, taxi-out times, performance on shared routes, and Airport-specific and day-of-week trends.

3.1.1 Overall Cancellation Rates

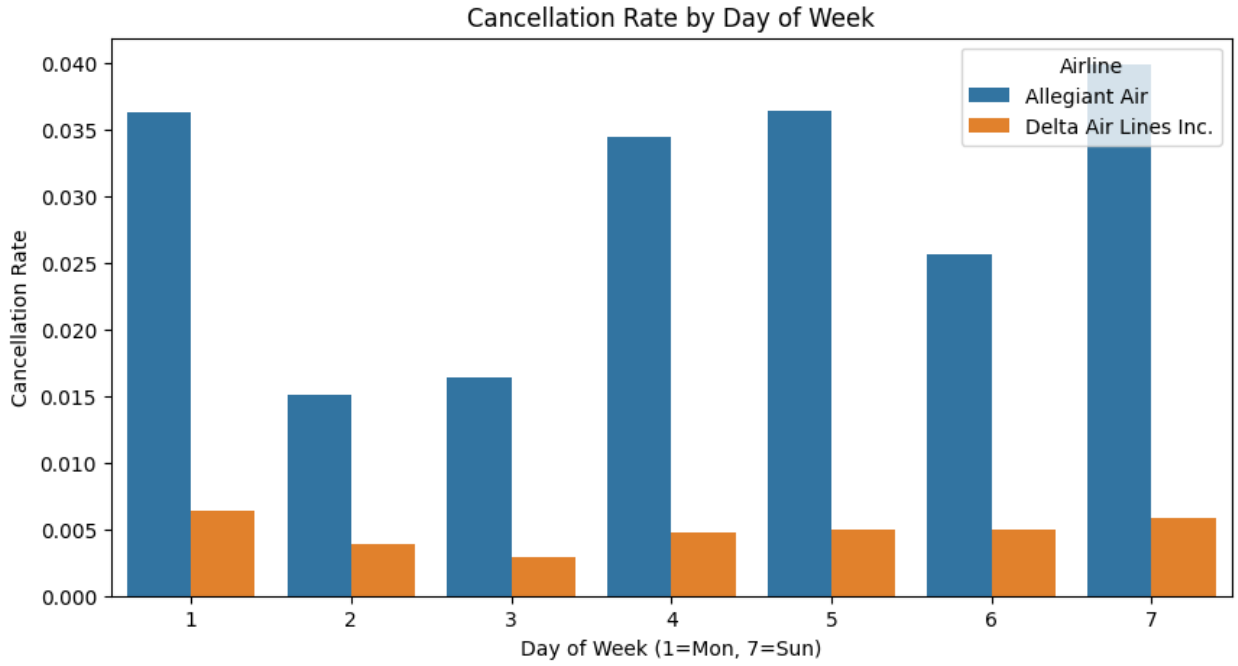

Figure 6: Cancellation Rate by Day of Week

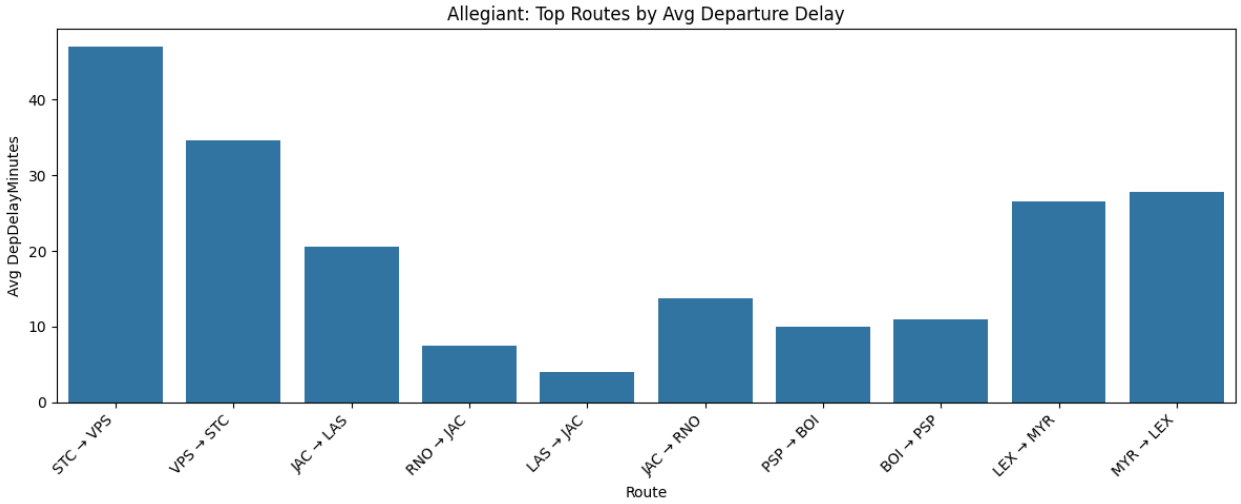

Figure 7: Allegiant's Top Routes by Avg Departure Delay

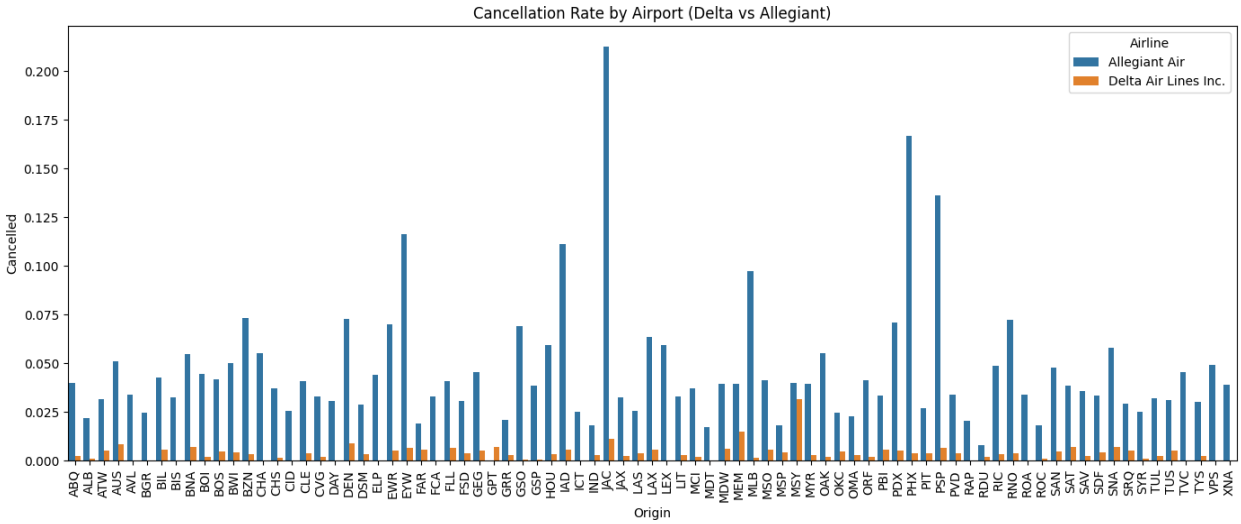

Figure 8: Comparative Cancellation Rate by Airport

Allegiant Air had a cancellation rate of 3.3%, while Delta had only 0.5%. This shows that Allegiant cancels flights 6x more often than Delta.

3.1.2 Departure Delays and Taxi-Out Times

Allegiant's average departure delay was approximately 19.6 minutes, more than double Delta's average of 8.9 minutes. Surprisingly, Delta had a slightly higher average taxi-out time, suggesting longer—but more stable and predictable—ground operations.

3.1.3 Cancellation Trends by Day of Week

Cancellations for Allegiant were highest on Sundays and Mondays, exceeding 3.5%, while Delta maintained a consistent cancellation rate of under 0.7% throughout the week. This suggests that Allegiant's weekend operations may be more strained.

3.1.4 Route-Level Analysis

When examining shared routes between the two airlines, Allegiant consistently had higher cancellation rates. For instance, on the CVG → LAX route, Allegiant canceled 12.8% of flights, while Delta canceled less than 1%. This trend was consistent across several other overlapping routes.

3.1.5 Airport Comparison

Looking at cancellations by airport of origin, Allegiant showed higher rates at nearly all major hubs it operates from, including Jackson Hole (JAC), Phoenix (PHX), and Palm Springs (PSP). Delta's cancellation rates remained low and consistent across its network of airports.

3.1.6 Discussion

Our analysis highlights clear operational differences between Allegiant and Delta. Allegiant's higher cancellation rate appears to be closely tied to longer departure delays, which are especially pronounced on specific routes and high-traffic days. Delta's better performance may be due to practices like schedule padding, the use of backup aircraft and crews, and more robust route planning.

Additionally, Allegiant shows more variability in cancellations by day and airport, which may reflect limited resources, fewer aircraft, or staffing constraints.

3.1.7 Recommendations for Allegiant Air

Our analysis shows that Allegiant Air cancels flights about six times more often than Delta, mainly due to departure delays, route performance, and limited scheduling flexibility. To help reduce cancellations, we recommend the following:

- **Focus on high-cancellation routes**
  Routes like CVG ↔ LAX, IND → LAX, and JAC ↔ LAS had cancellation rates over 30%. Allegiant should reduce flight frequency on these routes during peak times, adjust departure windows, and build in buffer time to improve reliability.

- **Improve ground operations**
  Delays before takeoff were a major cause of cancellations. Improving boarding speed, gate efficiency, and taxi-out timing can help keep flights on schedule and reduce risk of cancellation.

- **Strengthen weekend schedules**
  Cancellations peaked on Sundays and Mondays. Adding staff or buffer time on these days can help relieve pressure and prevent delays from cascading into cancellations.

- **Use real-time monitoring tools**
  Tracking weather, delays, and aircraft readiness in real time can help Allegiant predict and prevent cancellations by making early adjustments to flights or crew assignments.

- **Learn from Delta's strategies**
  Delta uses backup aircraft, standby crews, and schedule padding to stay on track. Allegiant should adapt these practices to fit its operations, especially on high-volume routes.

- **Increase flexibility**
  As a smaller airline, Allegiant is more impacted by disruptions. Having spare crews or planes at key airports would allow faster recovery from delays without canceling flights.

By addressing these areas, Allegiant can lower its cancellation rate and deliver a more reliable experience for passengers.

3.2 Methods for Geographical Analysis

This study had additional aims to extract patterns and trends involving flight delay and cancellations as it relates to geographic location. Understanding whether location impacts the likelihood of delay or cancellation is crucial. This study focuses on the top 2 origin cities experiencing the highest total number of delays and cancellations. The top 2 origin cities are extracted from each airline separately to further understand each airline's unique routes. After extracting the top 2 origin cities for both airlines, further analysis dives into the destination cities of high level cancellation rates, relative to the acquired top 2 origin cities of each airline.

3.3 Methods for Comparison of 2020 and 2021 Flight COVID-19 Analysis

In order to compare the 2020 and 2021 flights data, the 2020 data was initially explored. In order to get an understanding of the data, the distribution of cancelled flight data was first illustrated to compare cancelled versus non-cancelled flights for 2020 and 2021. Next, the Number of flights in 2020 and 2021 were compared for the two airlines we focused on in this analysis: Delta and Allegiant. Finally, the quarterly flight data was explored for 2020 and 2021 to illustrate the changes in flight patterns over each quarter of the year.

To get a better understanding of the data, time series analysis was then performed. To do so, the data was separated by the month of year, and the total number of flights per month were plotted over the years 2020 and 2021. Next, the cancellation rate was calculated per month and plotted comparatively over the years 2020 and 2021.

4. Results

4.1 Seasonality

Seasonality of departure delays were visualized to understand the relationship between time of year and likelihood of flight delays. From Figure 9 below, the following insights were extracted:

- Delta Air Lines Inc. saw peak departure delays between late-December and early-January with spikes in early-May, June-September, and October.
    - Potential Causes:
        - June-September: Delta may be experiencing higher delays due to higher total flights during the summer months.

        - December-January: Delta may be experiencing higher delays due to increased travel during Thanksgiving, Christmas, and New Years.
        - May and October: There is no indication at this time of possible causes for delays in these months.
- Allegiant Air saw peak departure delays between June and August with some spikes in late-November and December.
    - Potential causes:
        - June-August: Allegiant may be experiencing higher delays due to higher total flights during the summer months.
        - November-December: Allegiant may be experiencing higher delays due to increased travel during Thanksgiving, Christmas, and New Years.

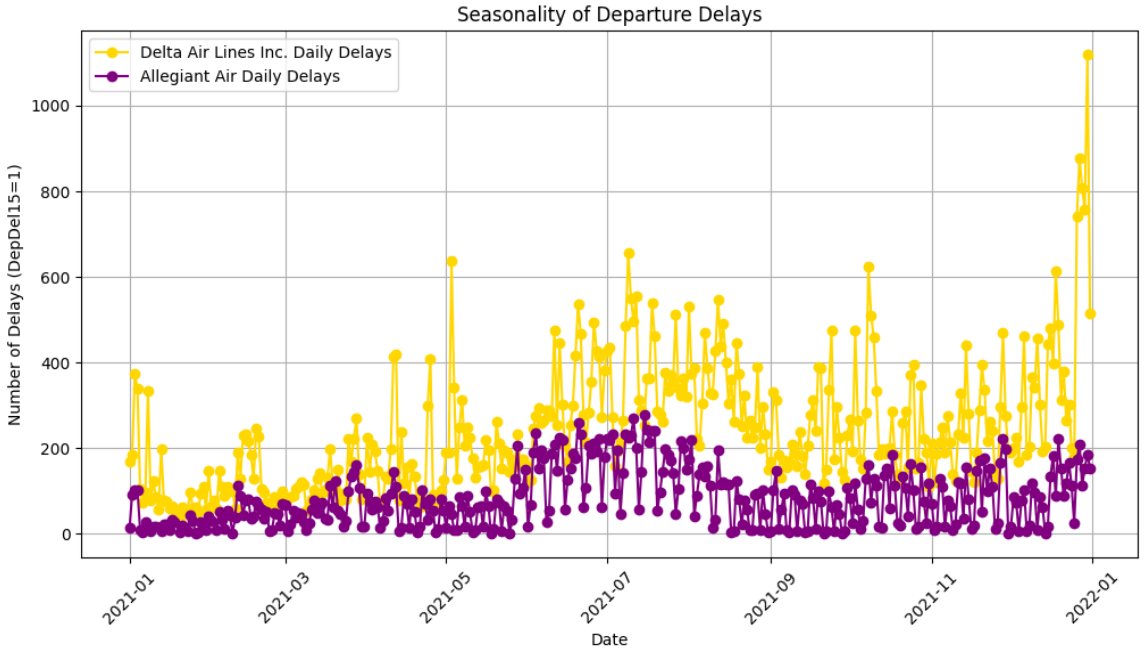

Figure 9: Seasonality of Departure Delays

4.2 Geographical Analysis

4.2.1 Flight Delays

In order to further understand complications in efficiency, a geographic analysis was conducted to pinpoint specific origin and destination cities which were heavily impacted by delays and cancellations. The highest total number of departure delays in each city were extracted for both Delta Air Lines Inc. and Allegiant Air. Figures 10 and 11 below indicate the following:

- Delta Air Lines Inc. typically faces the most departure delays when flying out of:
    - Atlanta, GA

    - Salt Lake City, UT
    - and New York, NY
- Allegiant Air typically faces the most departure delays when flying out of:
    - Sanford, FL
    - Las Vegas, NV
    - and St. Petersburg, FL

Delta Origin City Departure Delays

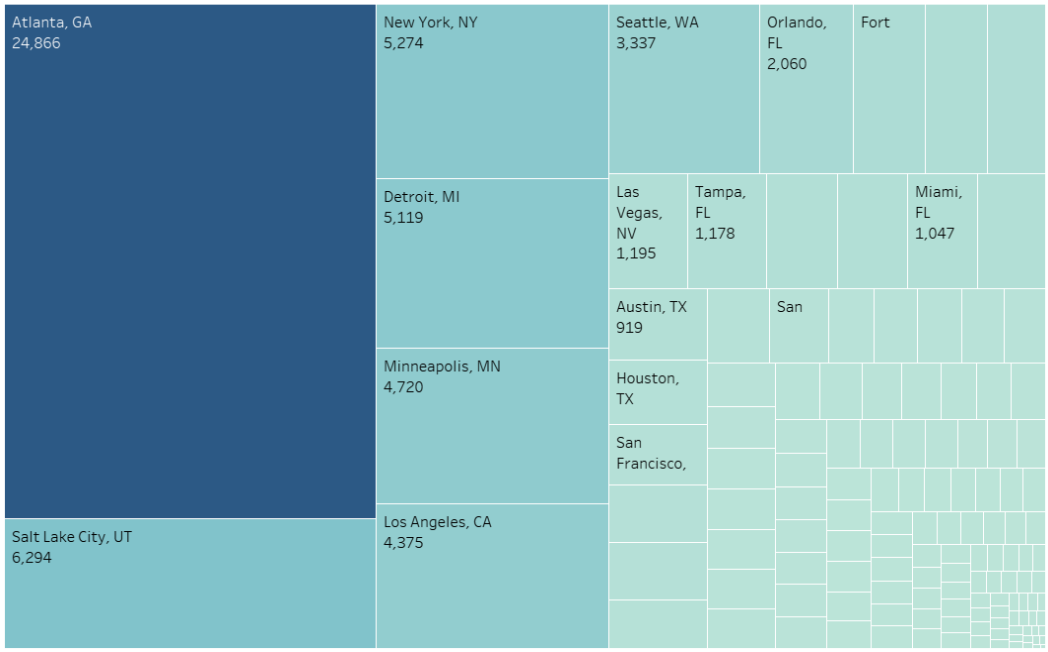

Figure 10: Delta Air Lines Origin City Departure Delays

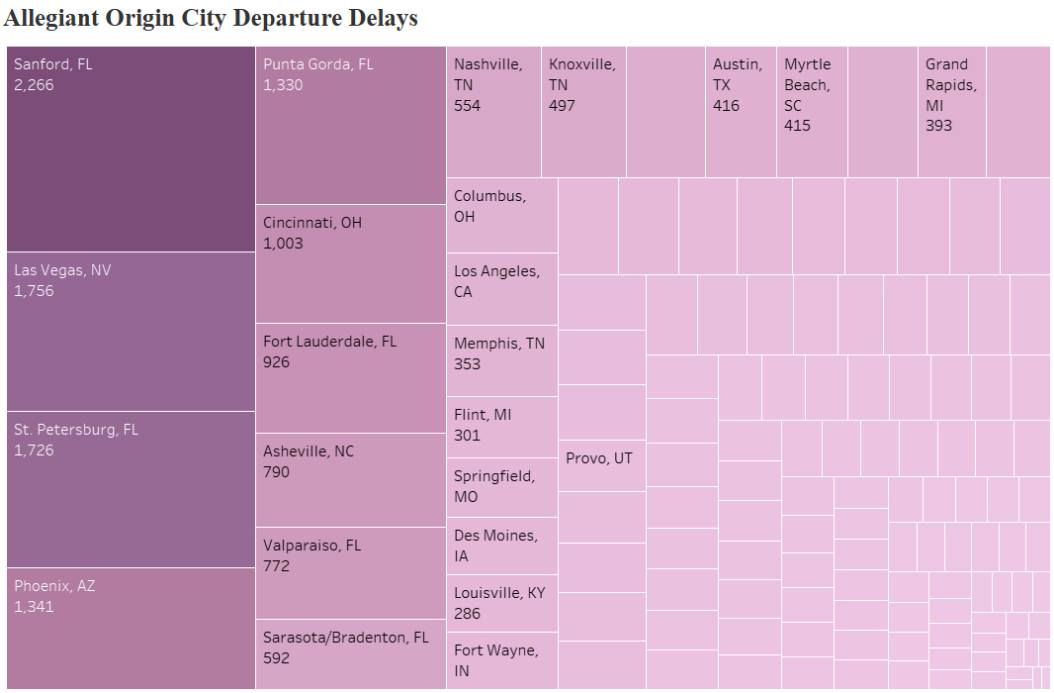

Figure 11: Allegiant Air Origin City Departure Delays

Upon analyzing the top origin cities facing the most departure delays for Delta, it seemed that flights originating from Atlanta, GA were significantly more prone to delays with a total of 24,866 delays in 2021. The next highest departure delay count was for Salt Lake City, UT which actually had considerably less with 6,294 total delays—equating to approximately 3.32% and 0.84%, respectively, of total Delta flights. In comparison, the top origin city facing most departure delays for Allegiant was Sanford, FL with 2,266 total delays. The next highest departure delay count was for Las Vegas, NV with 1,756 total delays—equating to approximately 1.96% and 1.52%, respectively, of total Allegiant flights.

In order to further analyze geographic trends, separate investigations for Delta and Allegiant were conducted based on their respective *high delay* origin cities: Atlanta, Salt Lake City, Sanford, and Las Vegas.

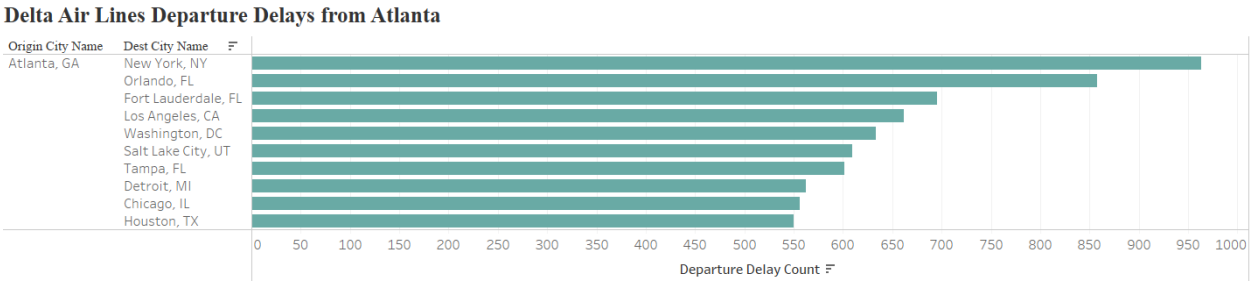

Figure 12: Delta Air Lines Departure Delays from Atlanta, GA

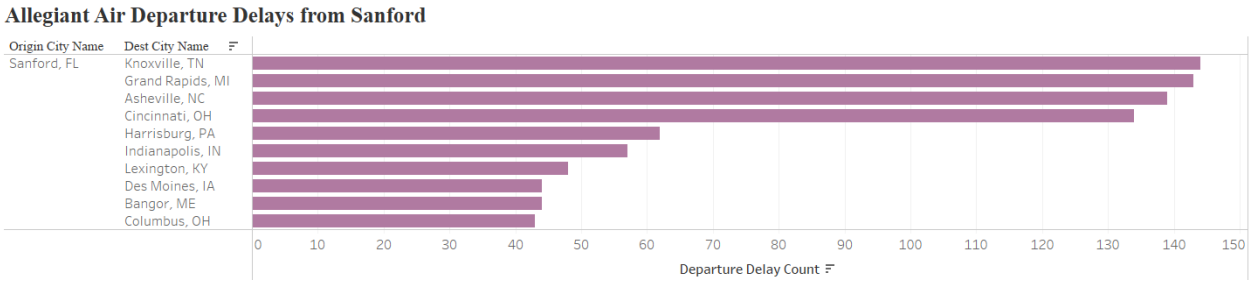

Figure 13: Allegiant Air Departure Delays from Sanford, FL

As gathered from Figure 12 above, Delta flights from Atlanta, GA faced the highest number of delays when flying to New York, NY with a total of 963 delayed flights. This is followed by Orlando, FL with a total of 858 delayed flights and Fort Lauderdale, FL with 695 delayed flights. Additionally, Delta flights flying from Salt Lake City, UT faced the highest number of delays when flying to Los Angeles, CA with a total of 308 delayed flights. This is followed by Seattle, WA with a total of 281 delayed flights and Dallas/Fort Worth, TX with 270 delayed flights. Figure 27 displaying Delta departure delays from Salt Lake City, UT can be found in the appendix.

For Allegiant, as seen in Figure 13 above, flights from Sanford, FL faced the highest number of delays when flying to Knoxville, TN with a total of 144 delayed flights. This is closely followed by Grand Rapids, MI with a total of 143 delayed flights and Asheville, NC with 139 delayed flights. Furthermore, Allegiant flights flying from Las Vegas, NV had the highest number of delayed flights to Des Moines, IA with a total of 63 delayed flights. This is followed by Memphis, TN and Cincinnati, OH with 59 and 55 delayed flights respectively. Figure 28 displaying Allegiant departure delays from Las Vegas, NV can be found in the appendix.

Beside this, the top 10 routes, or destinations, from each *high delay* origin city were extracted. Each route represents areas for improvement for their respective airlines. This study highlights 40 total routes—20 routes per airline.

4.2.2 Flight Cancellations

In addition to geographic analysis for flight delay patterns, further analysis of geographic trends for flight cancellations was conducted. In this section, the highest total number of cancellations in each city were extracted for both Delta Air Lines Inc. and Allegiant Air. Figures 14 and 15 below indicate the following:

- Delta Air Lines Inc. typically faced the most cancellations when flying from:
  - Atlanta, GA
  - New York, NY

    - and Seattle, WA
- Allegiant Air typically faced the most cancellations when flying out of:
    - Las Vegas, NV
    - Sanford, FL
    - and St. Petersburg, FL

Interestingly, there is an overlap for both Delta and Allegiant, where each individual airline shares common origin cities between *highest delay* and *highest cancellation*. For example, while Delta experienced highest flight delays in Atlanta, GA—as established in Section 4.2.1—it also faced the highest number of cancellations in Atlanta, GA. This observation is also true for Delta's flight flying out of New York, NY. As for Allegiant, they experienced the highest flight delays in Sanford, FL. This city came second in total number of flight cancellations. Another top city Allegiant flies from that shares this trend is St. Petersburg, FL.

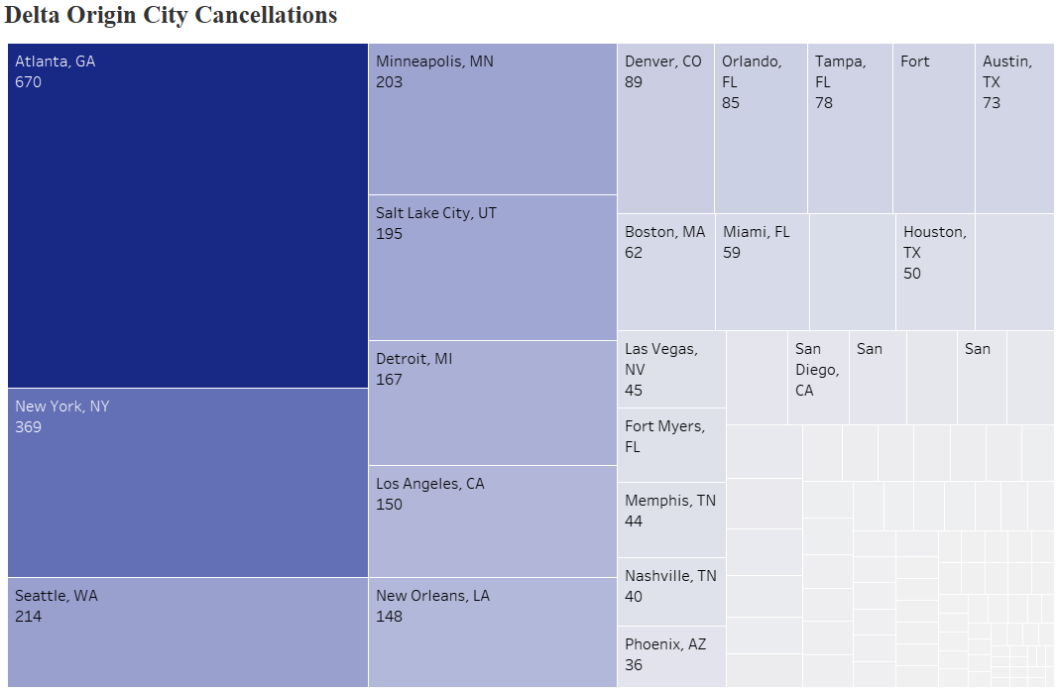

Figure 14: Delta Air Lines Origin City Cancellations

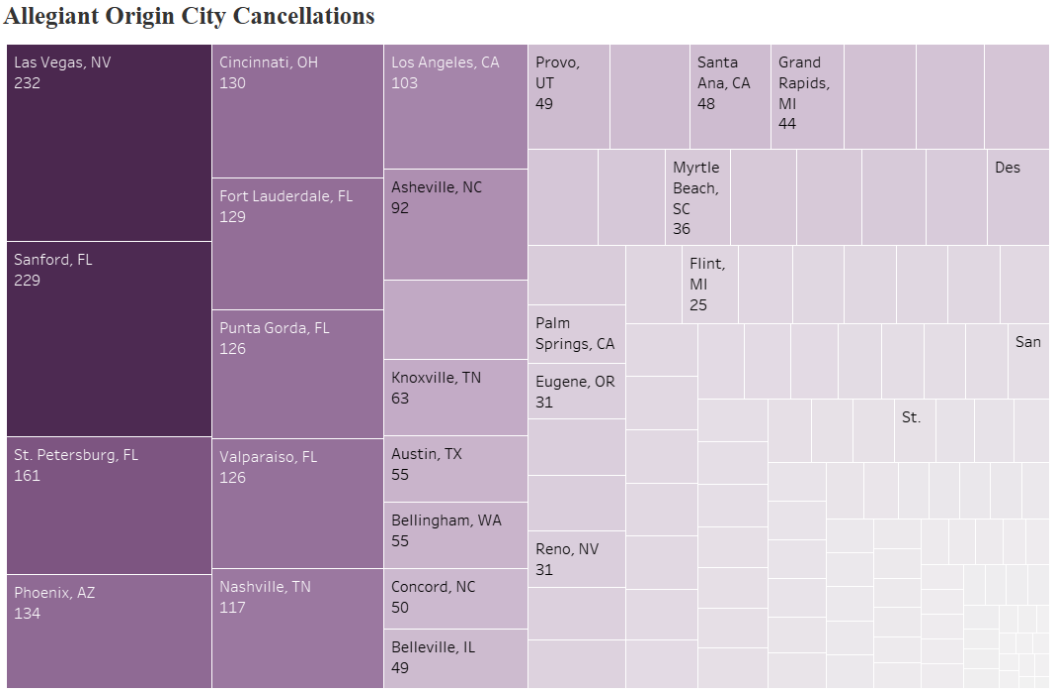

Figure 15: Allegiant Air Origin City Cancellations

Upon analyzing the top origin cities facing the highest total number of cancellations for Delta, it seemed that flights originating from Atlanta, GA were more prone to flight cancellations in 2021. The next highest flight cancellations were from New York, NY and Seattle, WA. On the other hand, the top origin city facing the highest total number of cancellations for Allegiant was Las Vegas, NV. It is closely followed by Sanford, FL and St. Petersburg, FL.

In order to further analyze geographic trends, separate investigations for Delta and Allegiant were conducted based on their respective *high cancellation* origin cities: Atlanta, New York, Las Vegas and Sanford.

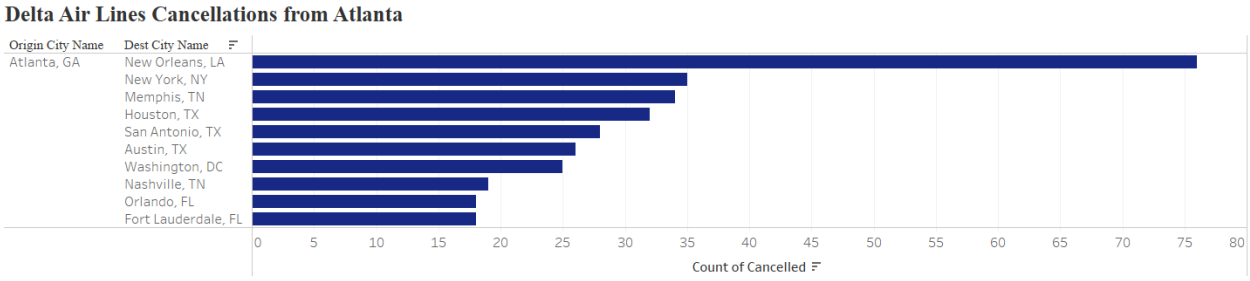

Figure 16: Delta Air Lines Cancellations from Atlanta, GA

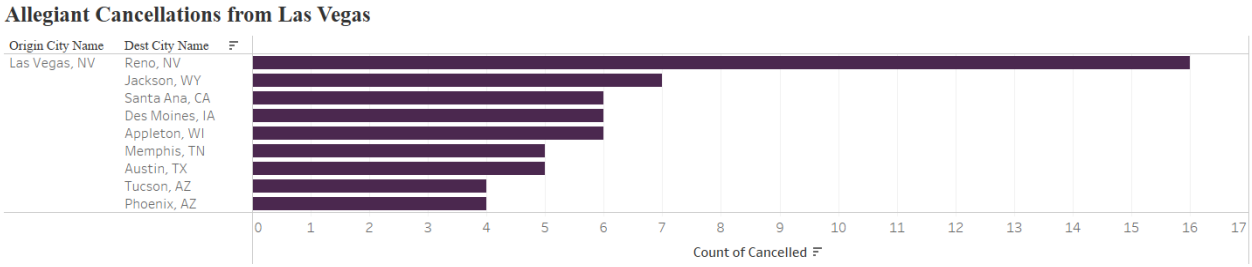

Figure 17: Allegiant Air Cancellations from Las Vegas, NV

As shown in Figure 16 above, Delta flights from Atlanta, GA faced the highest number of cancellations when flying to New Orleans, LA with a total of 76 flights. This number is drastically higher than any other routes flying from Atlanta, GA. It is followed by New York, NY and Memphis, TN with 35 and 34 total cancelled flights respectively. Additionally, as shown in Figure 29 in the appendix, Delta flights originating from New York, NY faced the highest number of cancellations when flying to Orlando, FL with a total of 40 cancelled flights. This is followed by flights to Tampa, Fort Lauderdale, and Miami, FL with 38, 35, and 33 total cancelled flights respectively.

For Allegiant, as shown in Figure 17 above, flights from Las Vegas, NV faced the highest number of cancellations when flying to Reno, NV with a total of 16 cancelled flights. This is double the amount of cancelled flights than the second highest which were to Jackson, WY with 7 cancelled flights. Furthermore, shown in Figure 30 in the appendix, Allegiant flights originating from Sanford, FL faced the highest number of cancellations when flying to Asheville, NC with 19 cancelled flights. This is followed by Knoxville, TN and Key West, FL with 13 and 10 cancelled flights respectively.

Overall, Allegiant saw a lower total number of cancelled flights, though this is intuitive considering the difference in total number of flights of each airline—Delta having a considerably larger number than Allegiant.

4.3 Comparison of 2020 and 2021 Flight COVID-19 Analysis

Initial analysis revealed key insights into the impact of COVID-19 on flight travel in 2020. Figure 18 shows that 2021 saw nearly 1.5 million more flights than 2020, yet cancellations were higher in 2020. Figure 19 illustrates the quarterly distribution of cancelled flights in 2020 and 2021. In Q1 of 2020 there was the highest number of flights for the year, but a sharp decrease in number of flights and increase in number of cancellations in Q2 of 2020, aligning with the pandemic's onset. Travel did slowly recover in the later quarters of 2020. Travel seemed to return back to a steady flow by Q3 of 2021, with flight numbers similar to that of the start of 2020. This information indicates how important it is to look at this data with the context of what was going on in the world at the time.

Next, Delta Air Lines and Allegiant Air were analyzed further by comparing 2020 and 2021 data. Based on the plot in Figure 20, it is clear that Allegiant Air had a small increase in flights from 2020 to 2021, while Delta seemed to have a much larger increase in flights from 2020 to 2021. This data suggests that Delta, a larger flight company, seemed to have bounced back better after the Pandemic, and increased the number of flights, whereas Allegiant had only a very slight increase in the total number of flights. Lastly we explored some time series data by following the number of flights and cancellation rates over each month in 2020 and 2021. As shown in Figure 21, the number of flights plummeted in 2020 around March, which is consistent with when the Pandemic hit. The lowest number of flights was around May of 2020, and then it began to steadily increase again. This steady increase continued into 2021, and then seemed to level off around July of 2021. Interestingly, this figure shows that between January and March of 2020 was the highest total number of flights, and the 2021 flights data never reached the same level. Finally, Figure 22 illustrated the cancellation rates in 2020 and 2021. For the most part, the cancellation rate stayed right around 1-3%. However there is a steep jump in cancellations consistent with the onset of the 2020 Pandemic. This data indicates that the cancellation rates stay relatively the same with minor fluctuations but major events, which have effects on travel, do have significant effects on flight cancellations.

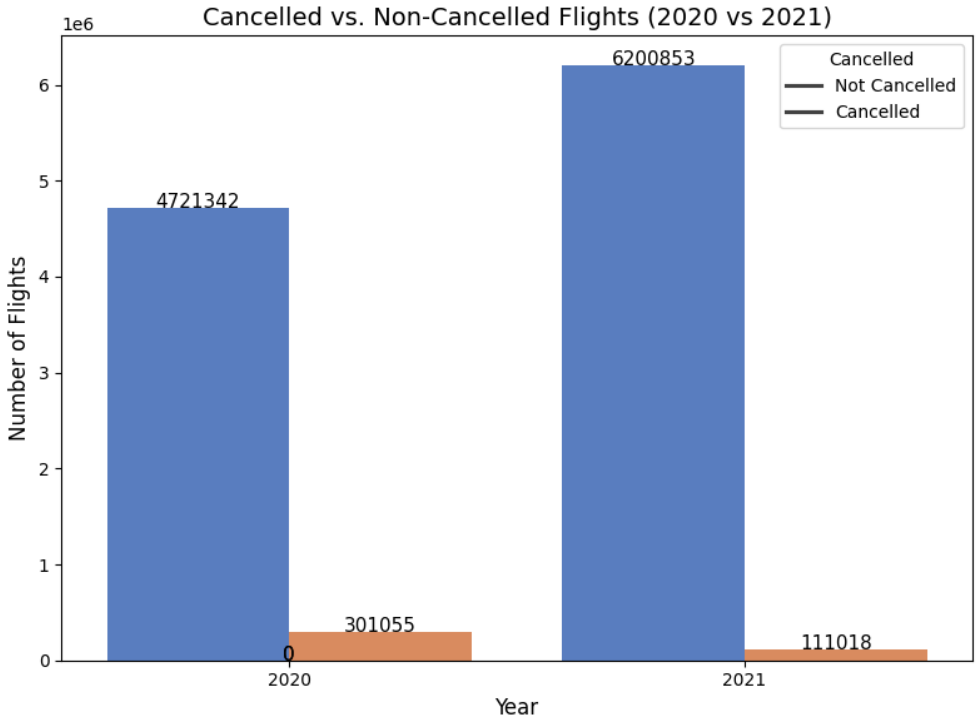

Figure 18: Comparison of Cancelled vs. Non-Cancelled Flights in 2020 vs. 2021

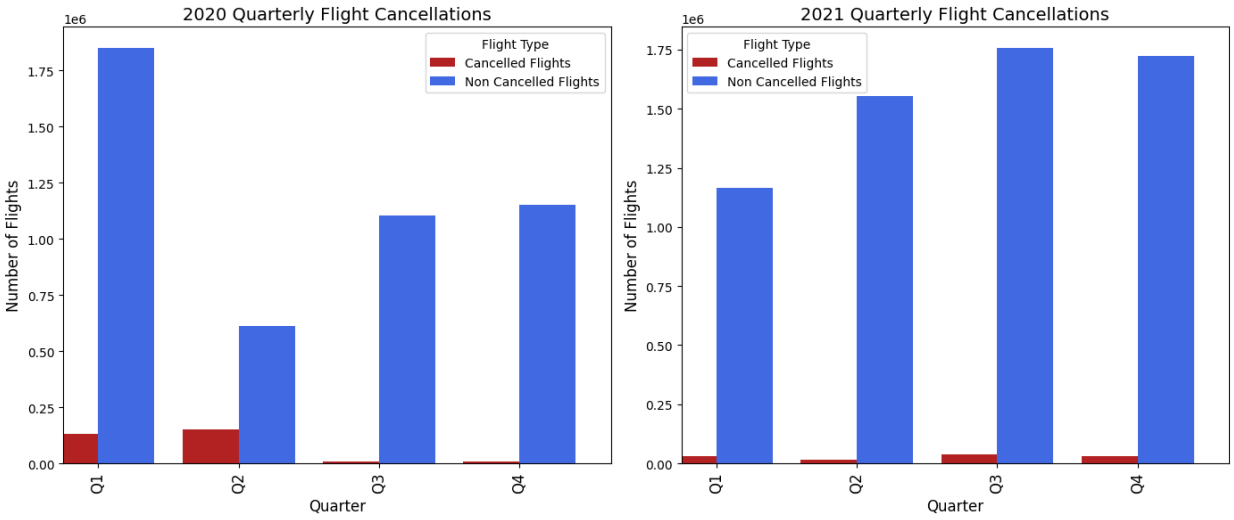

Figure 19: Comparison of Quarterly Cancelled vs. Non-Cancelled Flights in 2020 vs. 2021

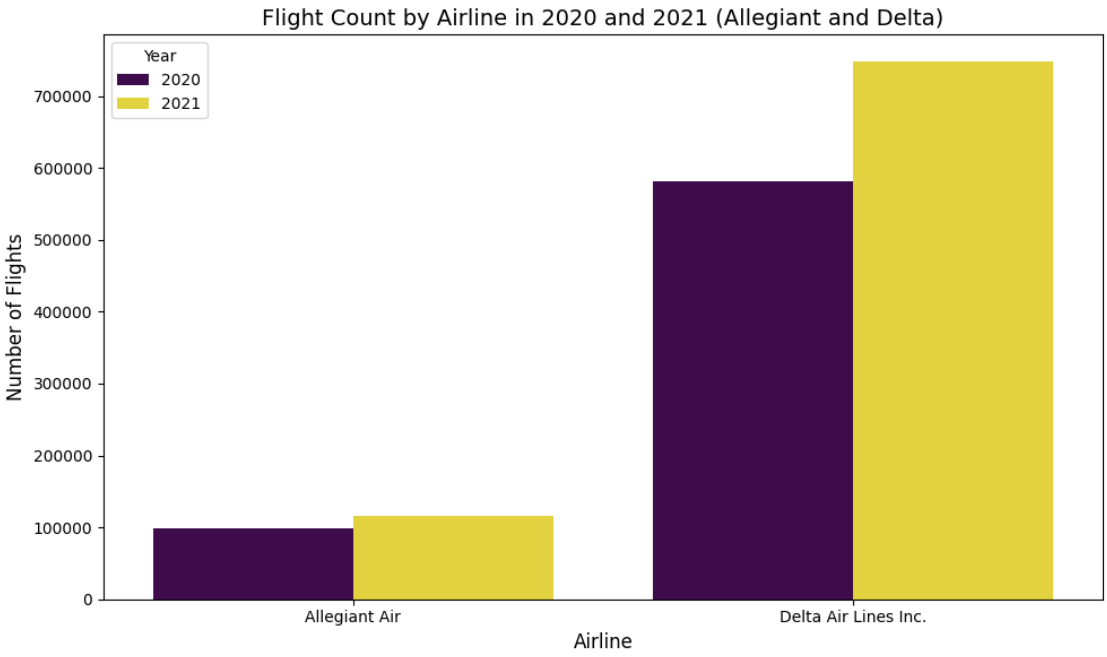

Figure 20: Comparison of Allegiant and Delta Flights in 2020 and 2021

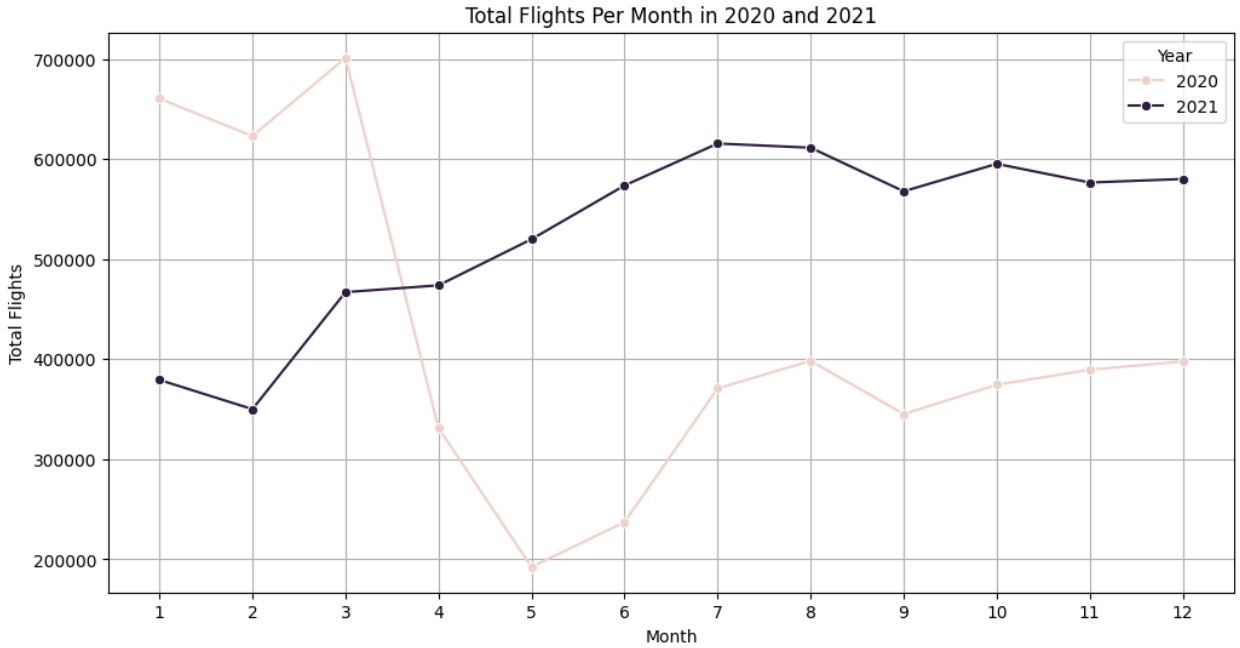

Figure 21: Total Flights per Month in 2020 and 2021

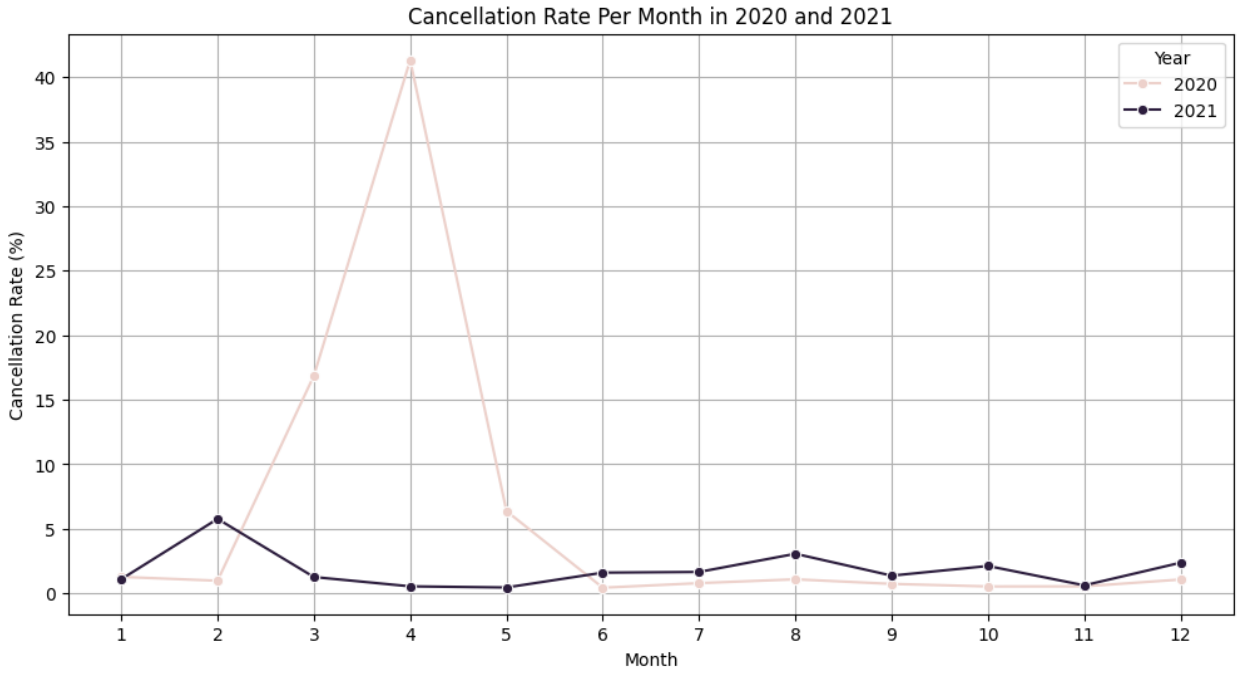

Figure 22: Flight Cancellation Rate per Month in 2020 and 2021

5. Problems Encountered

A major problem with our data was that modeling cancellations and delays of flights ended up being a major challenge. The class imbalance in the 'Cancelled' column made it difficult to accurately predict cancellations, as there were far fewer cancelled flights compared to non-cancelled ones. Additionally, the large number of variables and the size of the dataset led to longer run times, especially when trying to use models such as SVM. Ultimately when we did run the models too, we experienced overfitting, as shown in the following two figures in which the accuracy for the models was 100%.

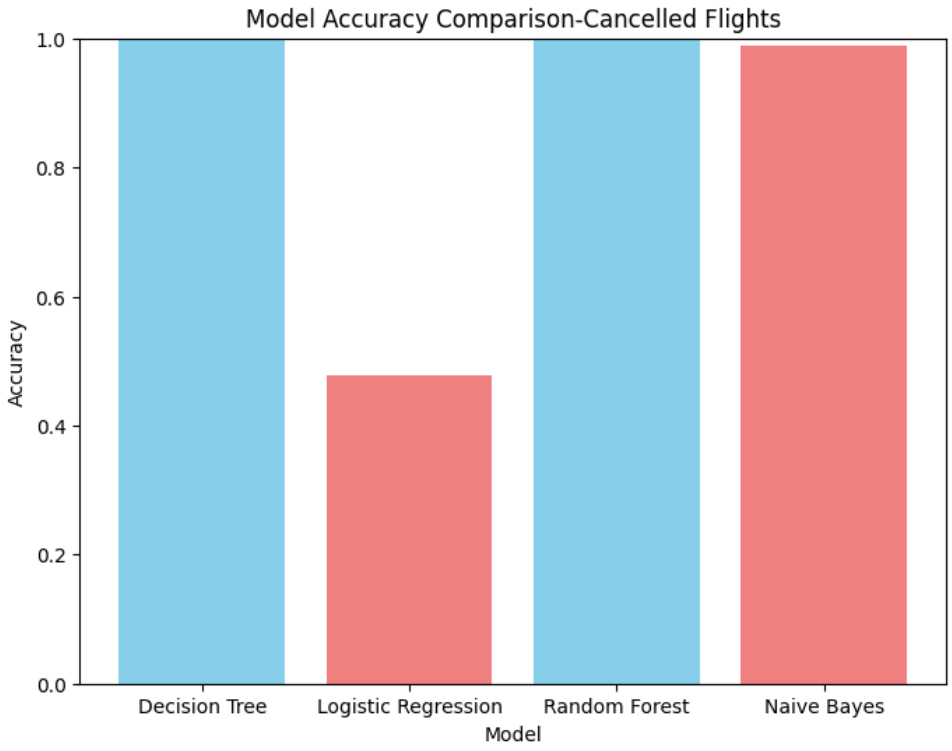

Figure 23: Model Comparison for Predicting Cancelled Flights

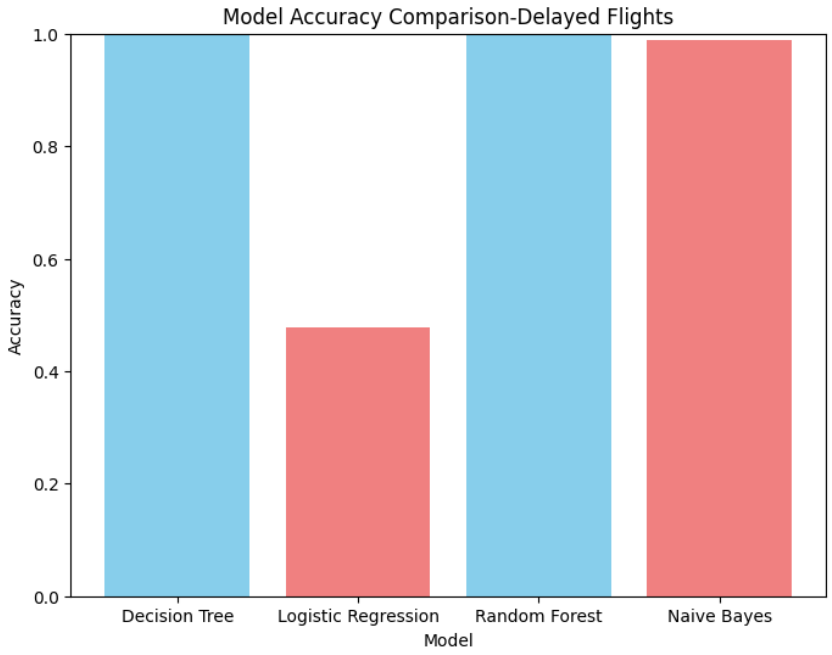

Figure 24: Model Comparison for Predicting Delayed Flights

6. Interesting Results

The logistic regression model was the only model we identified that did not seem to be overfitting with our data. Therefore, despite its low accuracy, we opted to explore the variables and their p-values. Based on the output shown in Table 1, we identified potential predictors of flight cancellations, such as airline, departure delay, and flight distance. However, the model's low R-squared value (0.0021) indicates a very weak fit to the data. We were hoping for a better model fit, as other unaccounted factors may influence cancellations.

Logit Regression Results

Dep. Variable:	Cancelled	No. Observations:	4418309
Model:	Logit	Df Residuals:	4418301
Method:	MLE	Df Model:	7
Date:	Tue, 25 Mar 2025	Pseudo R-squ.:	0.002086
Time:	21:13:11	Log-Likelihood:	-3.9021e+05
converged:	True	LL-Null:	-3.9102e+05
Covariance Type:	nonrobust	LLR p-value:	0.000

	coef	std err	z	P>|z|	[0.025	0.975]
const	-3.9035	0.014	-270.474	0.000	-3.932	-3.875
Airline	0.0099	0.001	18.001	0.000	0.009	0.011
Origin	-0.0003	3.56e-05	-9.286	0.000	-0.000	-0.000
Dest	-0.0003	3.56e-05	-9.665	0.000	-0.000	-0.000
Diverted	-34.1645	1.93e+06	-1.77e-05	1.000	-3.77e+06	3.77e+06
DepDelayMinutes	0.0244	0.003	7.824	0.000	0.018	0.031
Distance	-0.0818	0.004	-20.934	0.000	-0.089	-0.074
Quarter	-0.0459	0.003	-13.708	0.000	-0.052	-0.039

Table 1: Results of Logistic Regression

7. Conclusion

Overall, we gained a much deeper understanding of airlines and flight patterns based on this analysis. The first takeaway was how much the COVID-19 Pandemic had an impact on travel. The number of flights drastically decreased after the Pandemic, and by the end of 2021, the number of flights had still not returned to their height before the Pandemic. It would be interesting to continue to inspect flight data from 2022, 2023, and see what the long term effects of the Pandemic were on flight travel. Another major takeaway from this analysis, is that there are major differences in travel based on the airline being used. As shown in our comparison between Delta and Allegiant, there are a lot of areas for improvement for Allegiant in terms of their cities of operation and decreasing their high cancellation rates. Lastly, it is important for travelers to note that there may be more delays based on the cities they are traveling through. For example, Louisiana, New Jersey, and Texas seemed to have the highest cancellation rates.

A major factor of our study which we wanted to explore was predicting flight cancellations. Unfortunately, we were unable to produce an accurate model capable of predicting flight cancellations based on a series of variables. However, through our analysis of the COVID-19 data, we were able to see that major events, particularly those with travel implications, can have massive effects on flight travel. We would be curious to look back in history and see if there are other major events in the United States, what kind of effects they had, and the long term effects they had on flight travel.

7.1 Recommendations

As gathered from the analysis, optimization recommendations for Allegiant Air are as follows:

Allegiant Air

1. *Seasonality: Summer months and winter holidays typically experience higher delay times. This could be heavily correlated to increased travel and flights in this season, however.*
2. *Geographic: Departures from Sanford, FL seem to experience high levels of delays. Specifically routes to Los Angeles, CA and Seattle, WA.*
3. *Predictive Scheduling: Adopt practices to anticipate and prevent delays.*
4. *Benchmark: Apply Delta's Route Management to identify best practices.*

7. Citations

1. "Air Traffic By The Numbers." *Federal Aviation Administration*, U.S. Department of Transportation, 9 Sept. 2024, www.faa.gov/air_traffic/by_the_numbers. Accessed 18 Mar. 2025.
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5. Allegiant Air. *About Us*. Allegiant Air, https://www.allegiantair.jobs/about-us/. Accessed 23 Mar. 2025.

8. Appendix

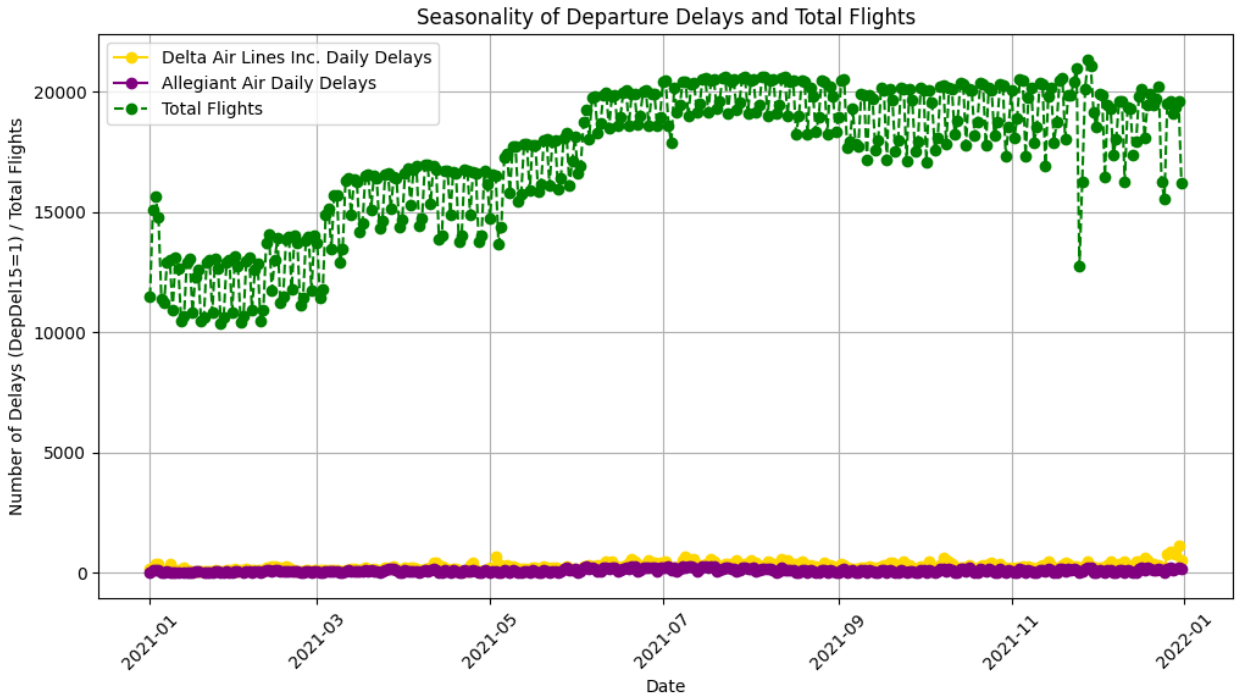

Figure 26: Seasonality of Departure Delays and Total Flights

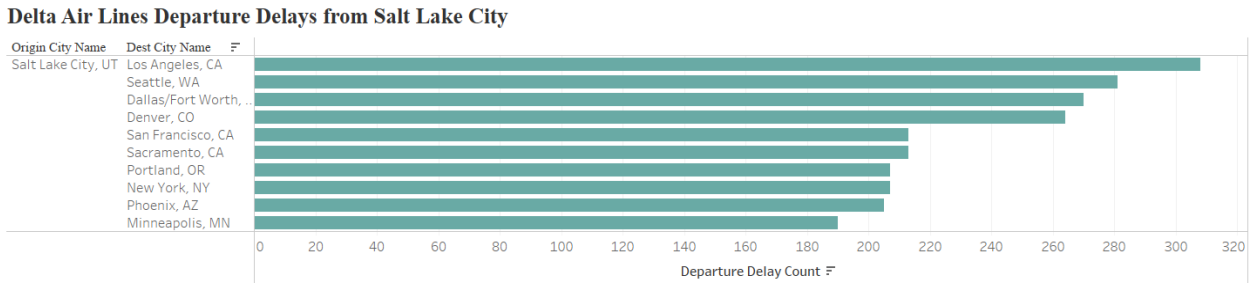

Figure 27: Delta Air Lines Departure Delays from Salt Lake City, UT

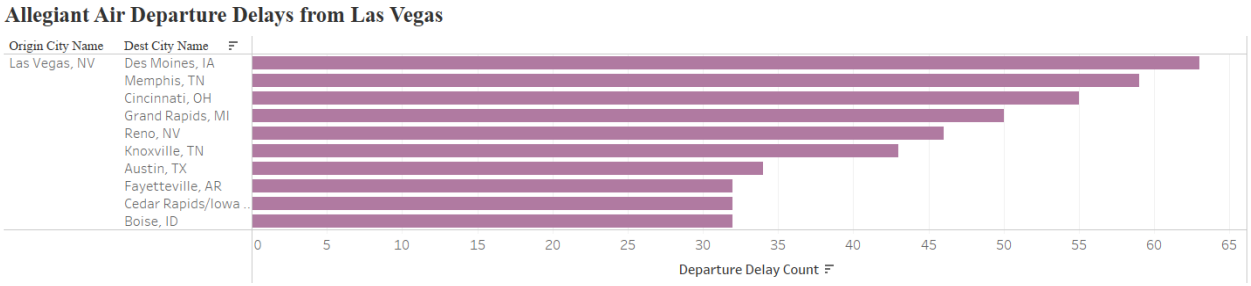

Figure 28: Allegiant Air Departure Delays from Las Vegas NV

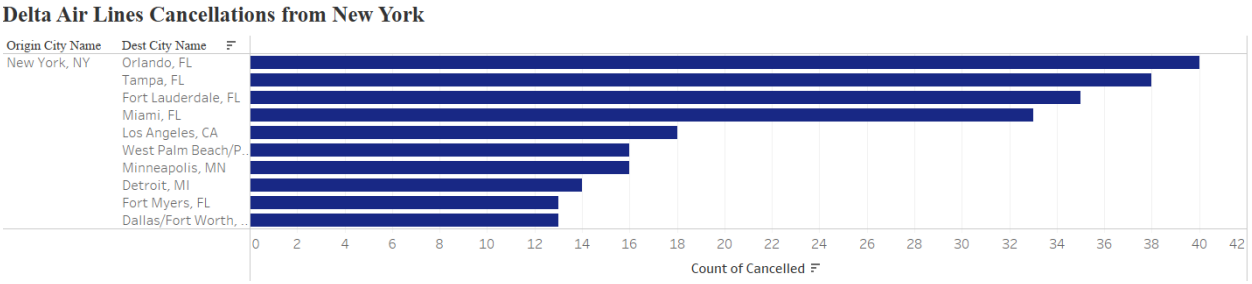

Figure 29: Delta Air Lines Cancellations from New York, NY

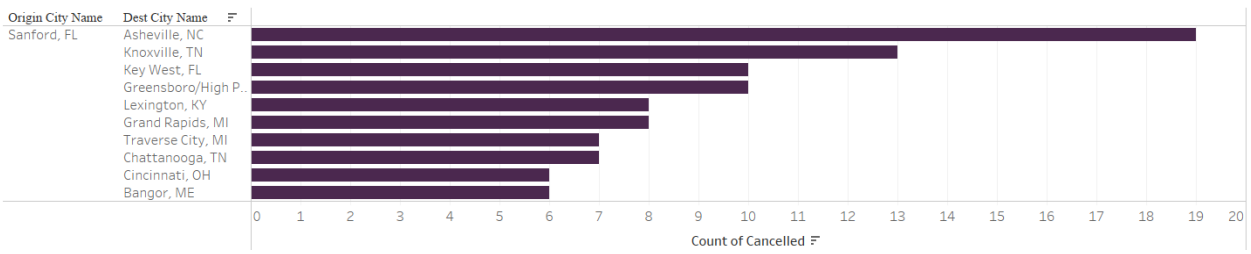

Figure 30: Allegiant Air Cancellations from Sanford, FL