Airport Departure Analysis

Across LAX, MIA, and JFK(appendix)

By Ria

Which Airports and Why

JFK

Northeastern Coast - Bad Reputation! 50 million passengers 2022

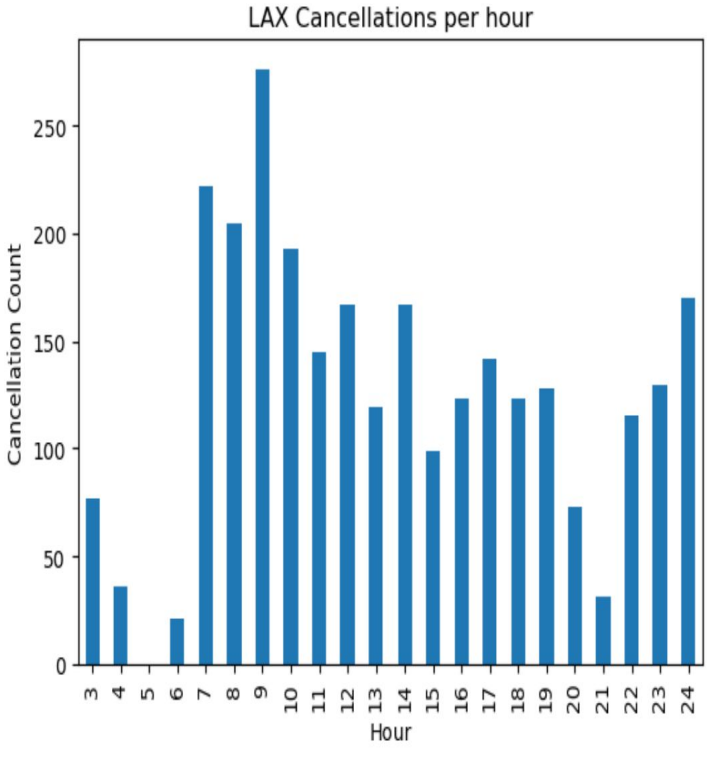
MIA

Southeastern Coast - 50.5 million passengers 2022

LAX

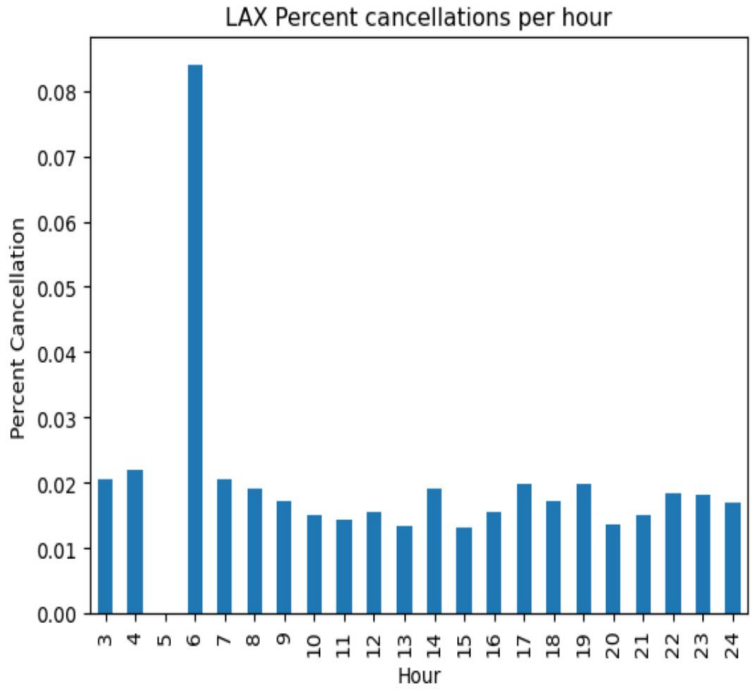
West Coast - Lots of International Flights

2nd busiest Airport in America! 66 Million Passengers in 2022



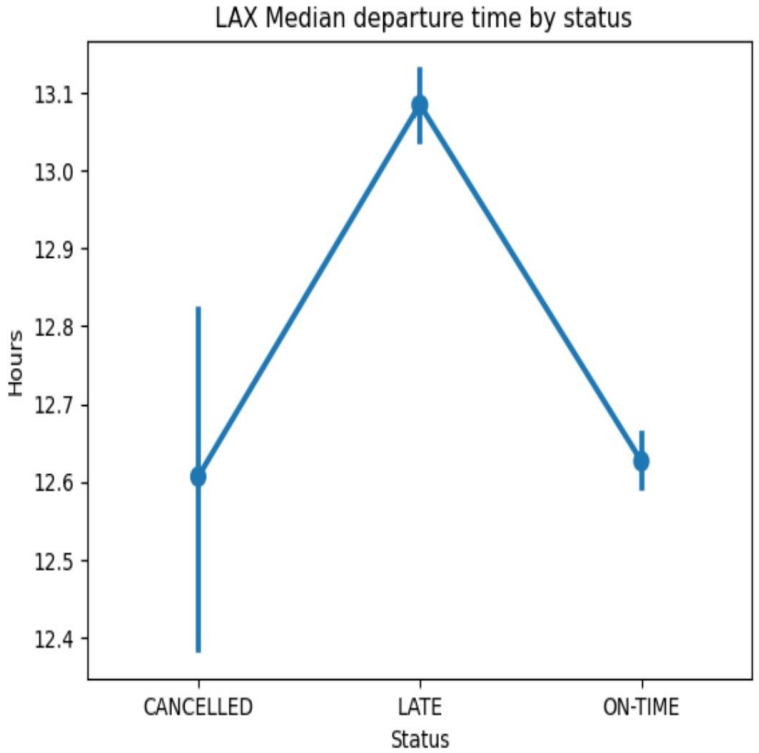
Hourly Cancellations

- Commercial Flights from 3 AM to 12 AM
- Peak Cancellation 9 AM and morning hours
- Low Early Hours Cancellation - fewer flights
- Pure numbers hard to interpret without percentage context
- Uptick around 10pm - end of day
- Middle Variability



Percent Cancellations

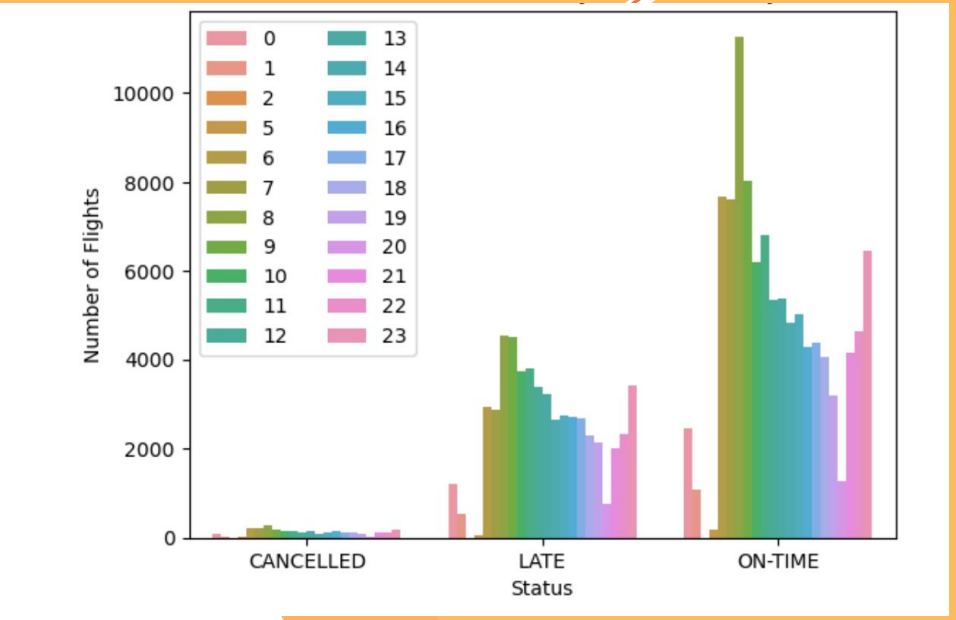
- Provides more context
- Don’t Schedule a 6 AM Flight!
- Pretty Constant except 6 AM and 5 AM
- Few 5 AM Flights/None Cancelled



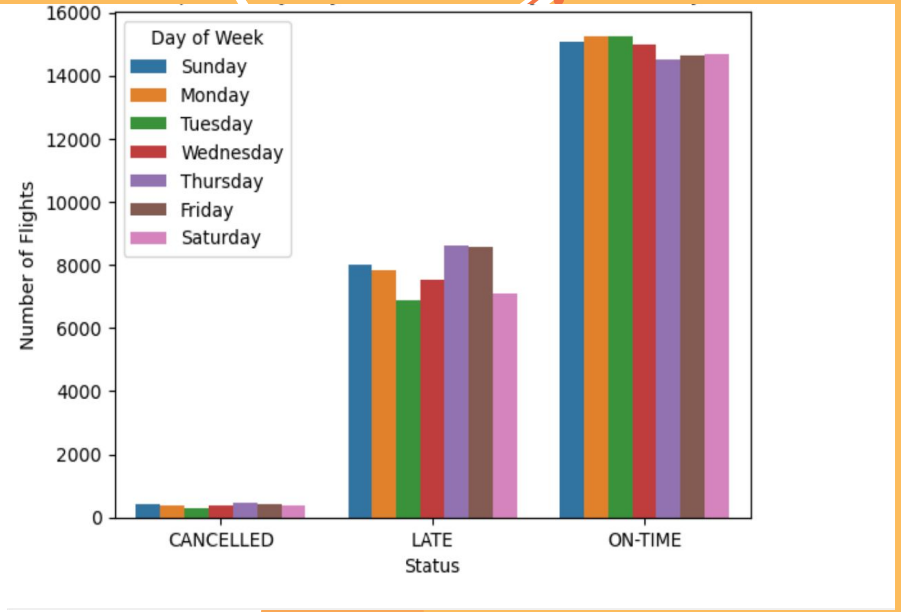
Departure Time by Status

- Canceled Median 12.6
- Late Median 13.05 - Flights around 1pm
- More likely to Experience delays at 1pm
- On Time Median 12.8 suggesting earlier flights are more likely to leave on time

LAX - Hourly Delay/Cancellatio n Analysis



- Low Cancellations: Cancellations are consistently low across all hours, indicating efficient scheduling or favorable conditions.
- Midday Delay Peak: Delays peak at 1 PM, suggesting congestion or operational challenges during midday.
- High On-Time Mornings and Evenings: On-time flights are most frequent in early mornings and evenings, reflecting robust airport operations during these times.
- Operational Focus: Insights suggest a need to focus on reducing midday delays for improved efficiency.
- Late and On-Time Mimic each other suggesting percentage analysis may be more useful

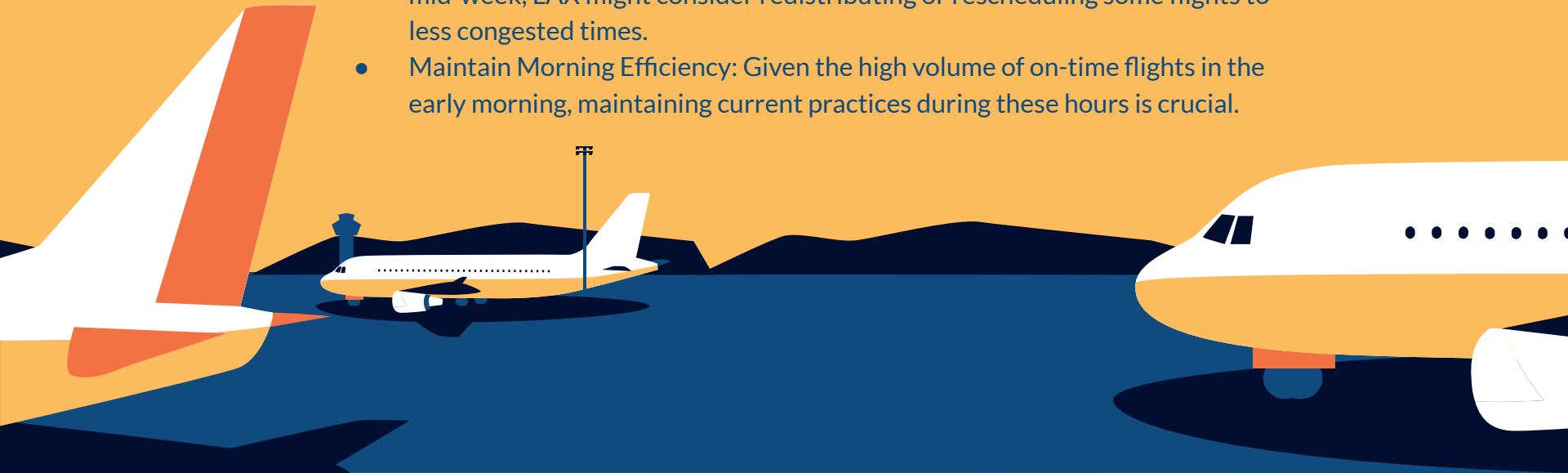


LAX - Daily Delay/Cancellation Analysis

- **Weekly Flight Patterns:** Analysis of LAX flights shows status distribution by day—Cancelled, Late, On-Time.
- **Stable Cancellations:** Flight cancellations remain low across all days, indicating consistent operational control.
- **Late Flights Variation:** Late flights show moderate variation, with mid-week days experiencing slightly higher numbers.
- **Consistent On-Time Performance:** On-time flights maintain high and consistent numbers throughout the week.
- **Strategic Takeaway:** Data suggests reliable performance with room for targeted improvements in mid-week delay management.

LAX - Overall Very Efficient!

- Optimize Midday Operations: Since delays peak at 1 PM, LAX could allocate additional resources during midday to handle operational bottlenecks.
- Enhance Mid-Week Scheduling: With a slight increase in late flights during the mid-week, LAX might consider redistributing or rescheduling some flights to less congested times.
- Maintain Morning Efficiency: Given the high volume of on-time flights in the early morning, maintaining current practices during these hours is crucial.



Appendix

MIA

50.5 Million
Passengers 2022

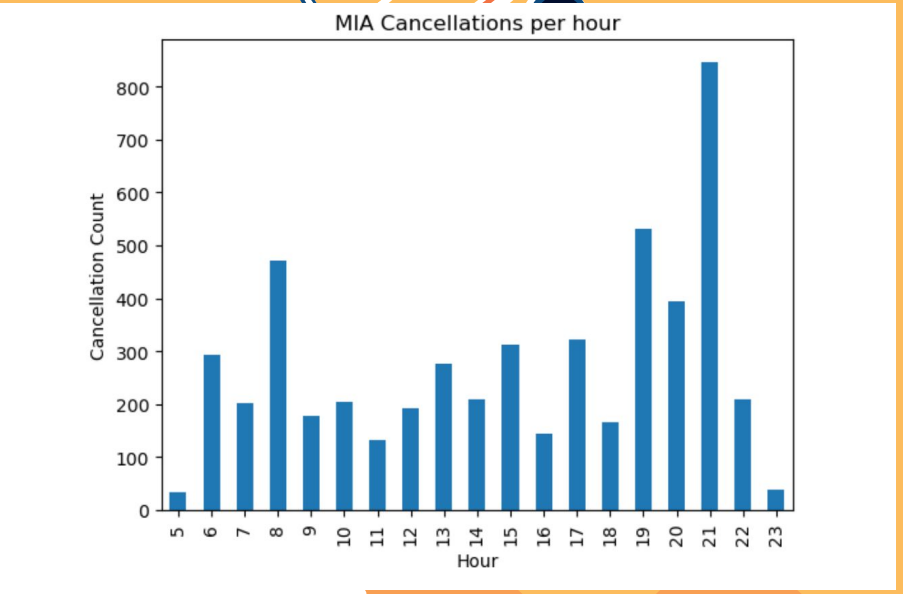
LAX

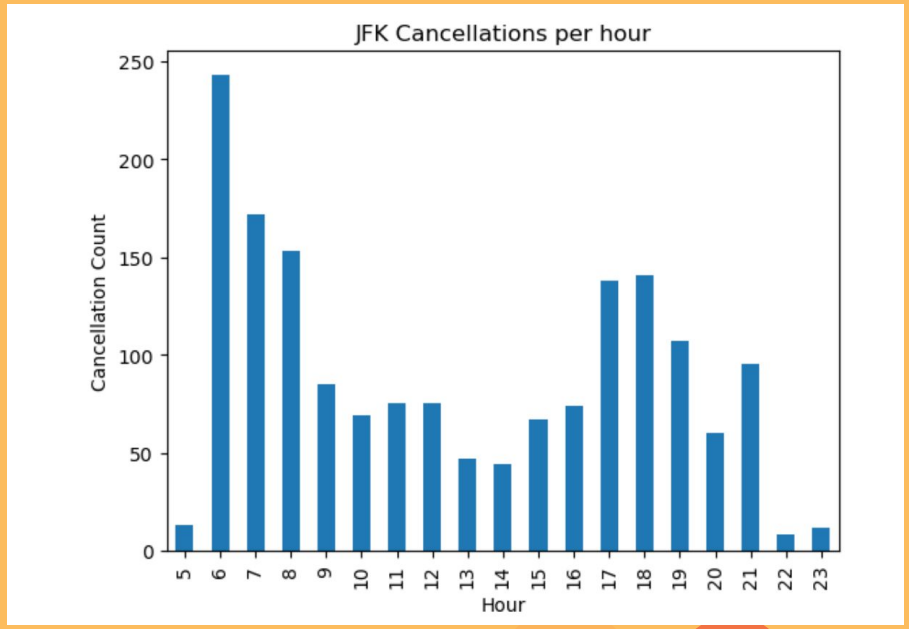
66 Million
Passengers in 2022

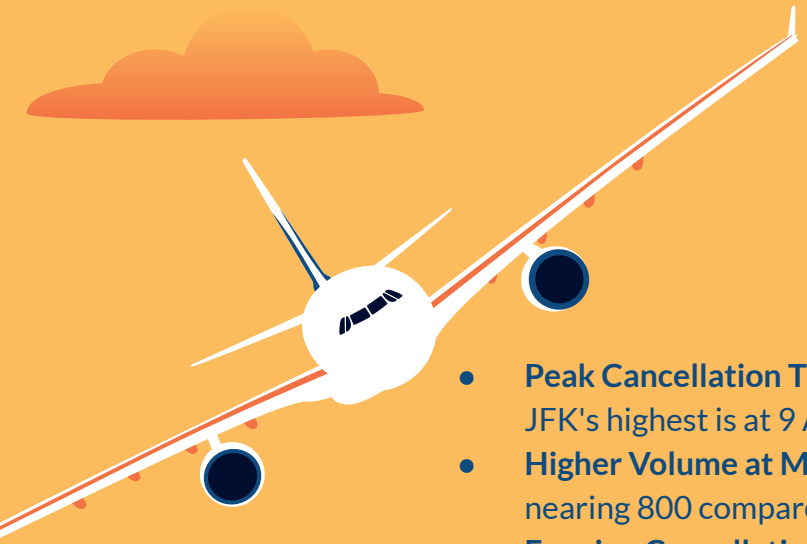
JFK

55 Million
Passengers 2022

Lets Compare!



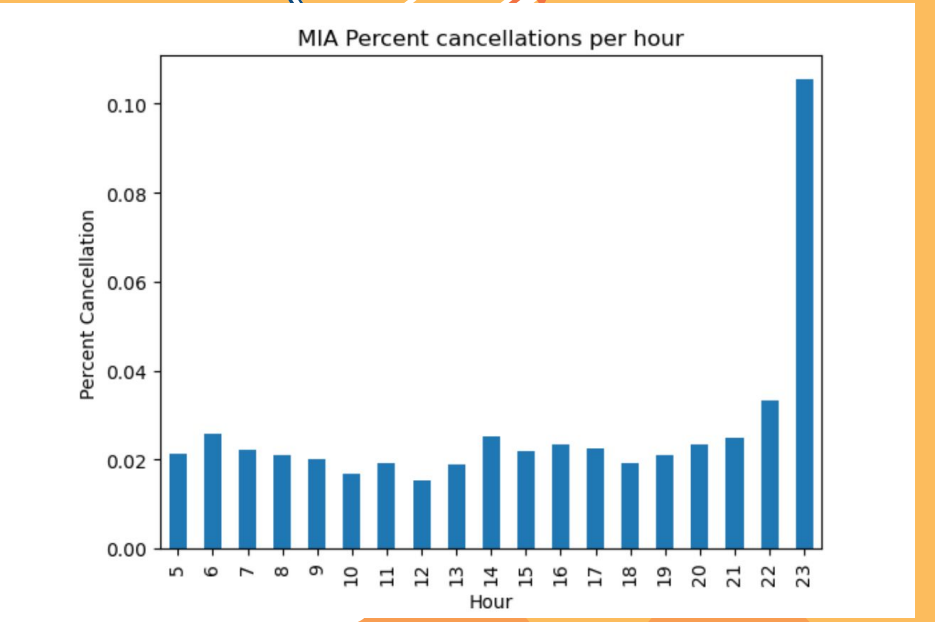


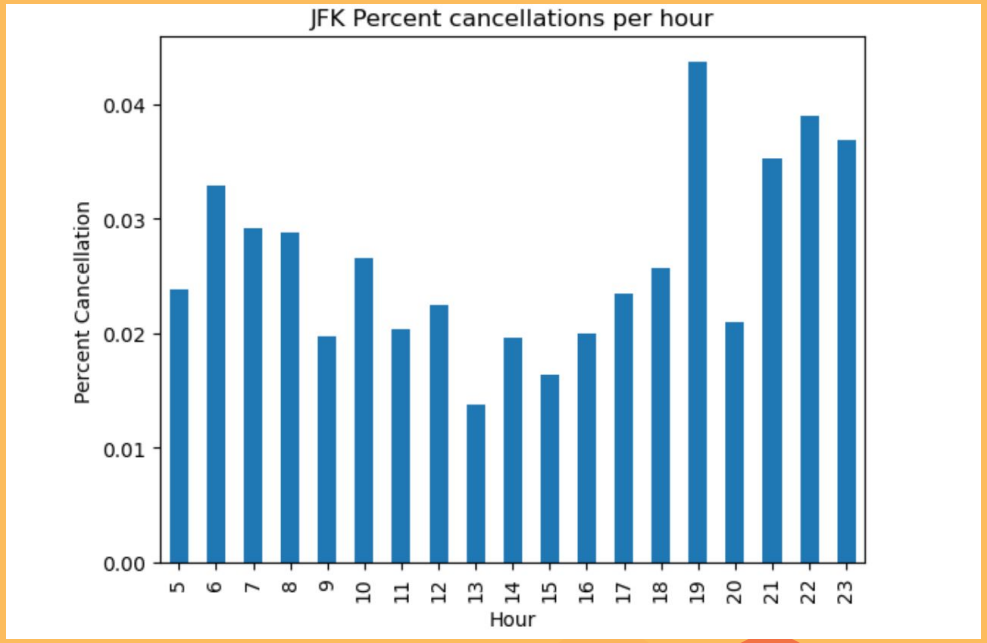


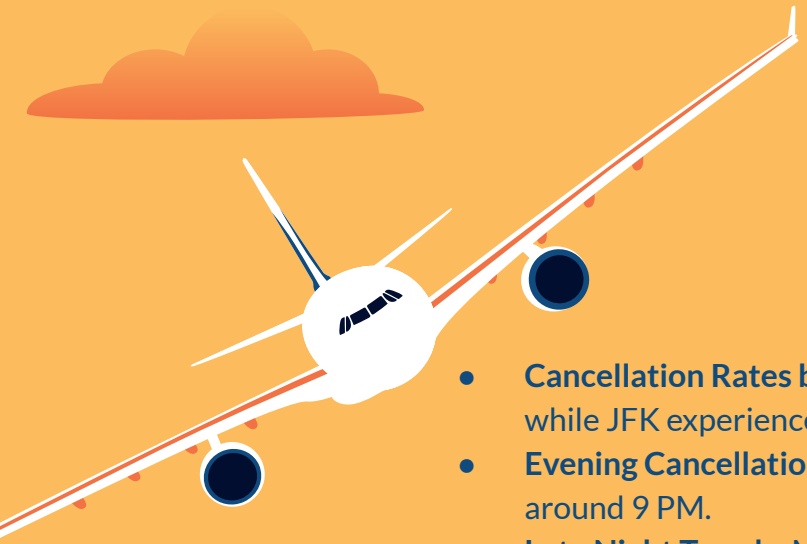
Insights

- **Peak Cancellation Times Differ:** MIA's peak cancellations occur around 5 PM and 8 PM, while JFK's highest is at 9 AM.
- **Higher Volume at MIA:** MIA experiences a higher volume of cancellations overall, with its peak nearing 800 compared to JFK's peak at around 250.
- **Evening Cancellations at MIA:** MIA shows a significant peak in the evening not present at JFK, indicating potential operational or scheduling differences.
- **Morning Cancellations at JFK:** JFK has a pronounced cancellation peak in the morning, which MIA does not exhibit to the same extent.
- **Midday Patterns:** Both airports show a dip in cancellations during midday hours, suggesting a common period of lower cancellation activities.
- **Late Night Activity:** Cancellations at both airports drop off after 8 PM, indicating less scheduled flight activity or higher flight execution rates at night.

Lets Compare!



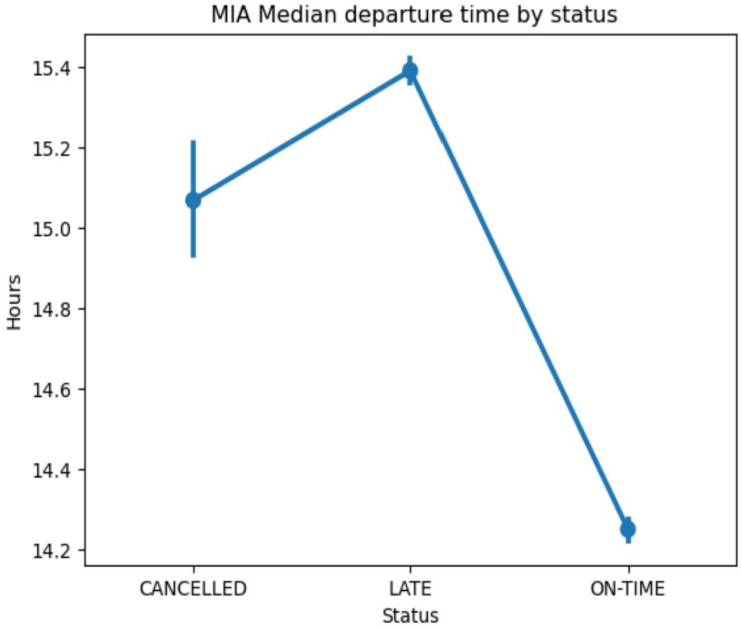


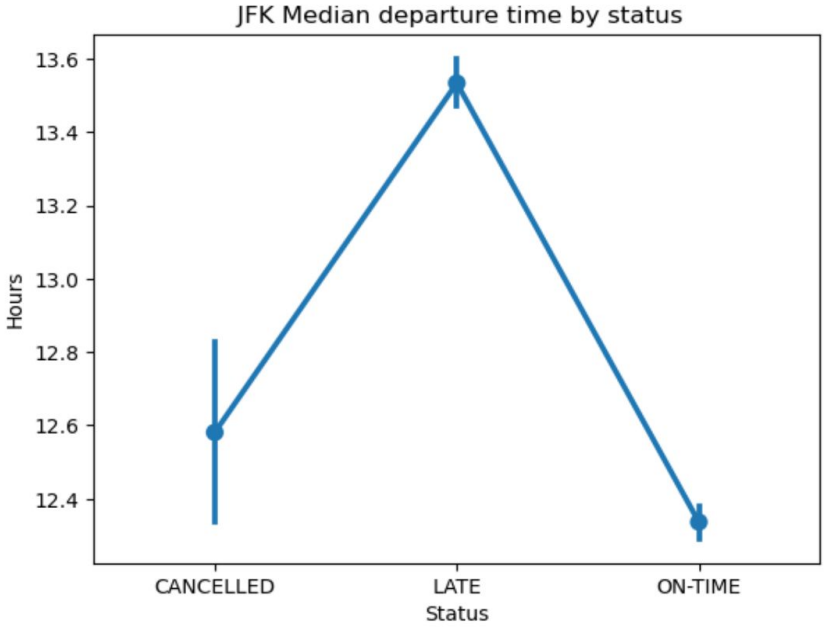


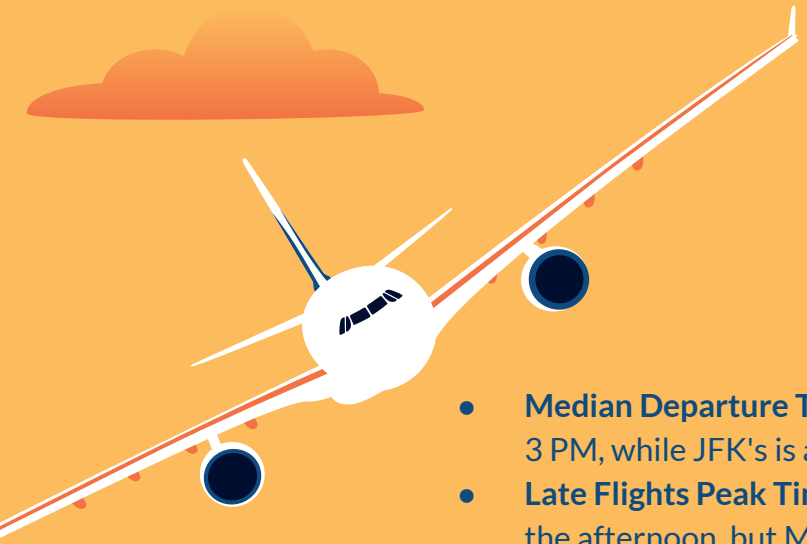
Insights

- **Cancellation Rates by Hour:** MIA shows a substantial spike in cancellation rates after 9 PM, while JFK experiences a more gradual increase throughout the afternoon to evening hours.
- **Evening Cancellations:** JFK has a higher percentage of cancellations in the evening, peaking around 9 PM.
- **Late Night Trends:** MIA's late-night cancellation rate spikes dramatically, suggesting operational issues or policy differences in handling late flights.
- **Afternoon Stability:** Both MIA and JFK have relatively stable cancellation rates during the afternoon hours before rising in the evening.
- **Early Morning Performance:** Cancellation rates are low for both airports in the early morning, indicating a strong start to daily operations.
- **JFK overall much Higher Cancellation Rates**
-

Lets Compare!





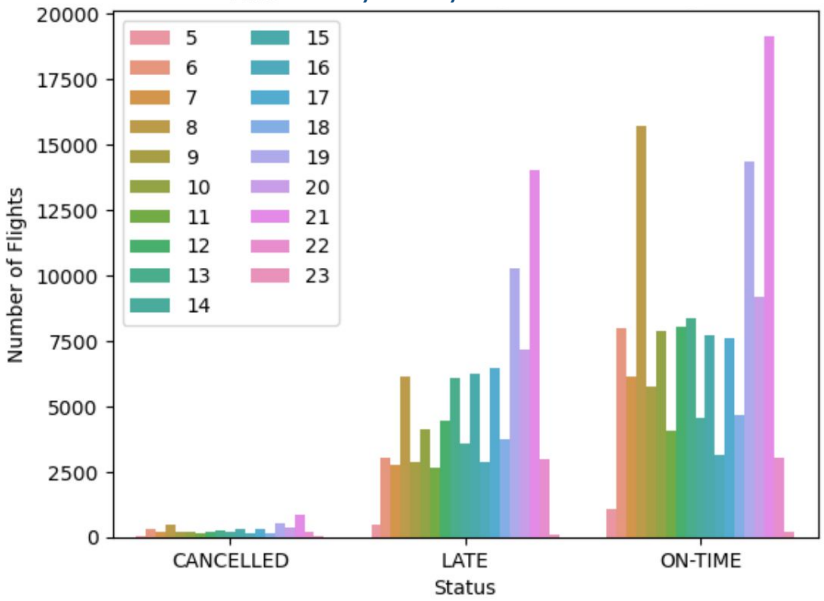


Insights

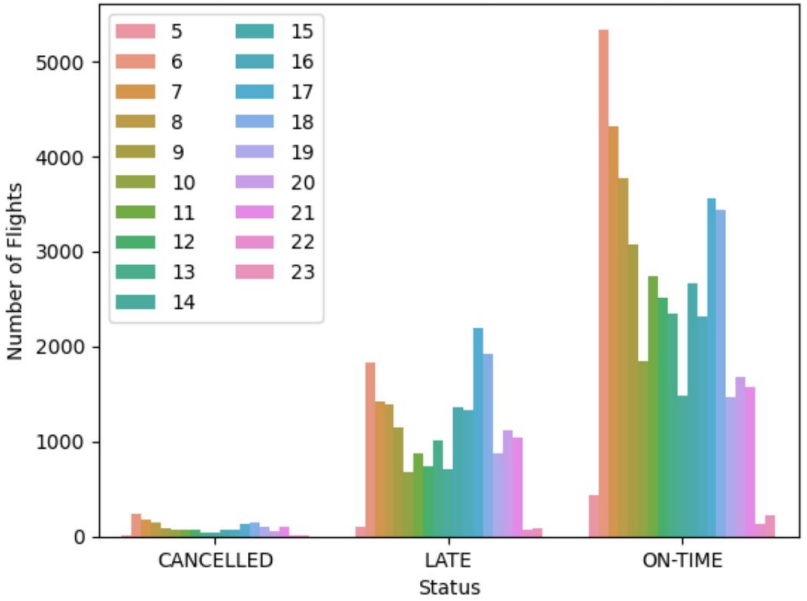
- **Median Departure Time for Cancelled Flights:** MIA's median time for cancelled flights is around 3 PM, while JFK's is around 1 PM.
- **Late Flights Peak Time:** Both MIA and JFK show the median departure time for late flights is in the afternoon, but MIA's peak is later, around 3 PM compared to JFK's peak at 1 PM.
- **On-Time Departure Consistency:** On-time flights at both airports have median departure times in the mid-afternoon, with MIA at about 3 PM and JFK slightly earlier.
- **Overall Time Frame:** MIA's overall median times for flight statuses span a narrower time frame in the afternoon, whereas JFK's spread across a broader part of the day.
- **Variability in Times:** Error bars indicate more variability in JFK's timings for late flights, suggesting a wider range of departure times.

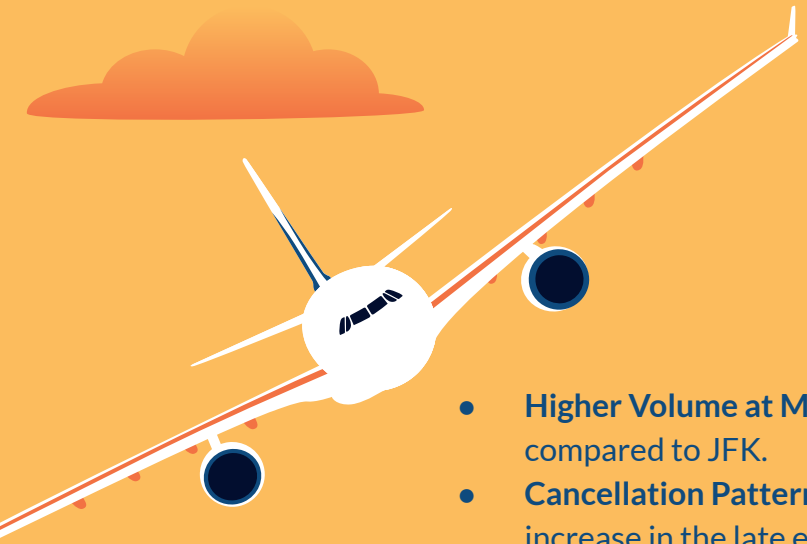
Lets Compare!

MIA Hourly Delay and Cancellation



JFK Hourly Delay and Cancellation

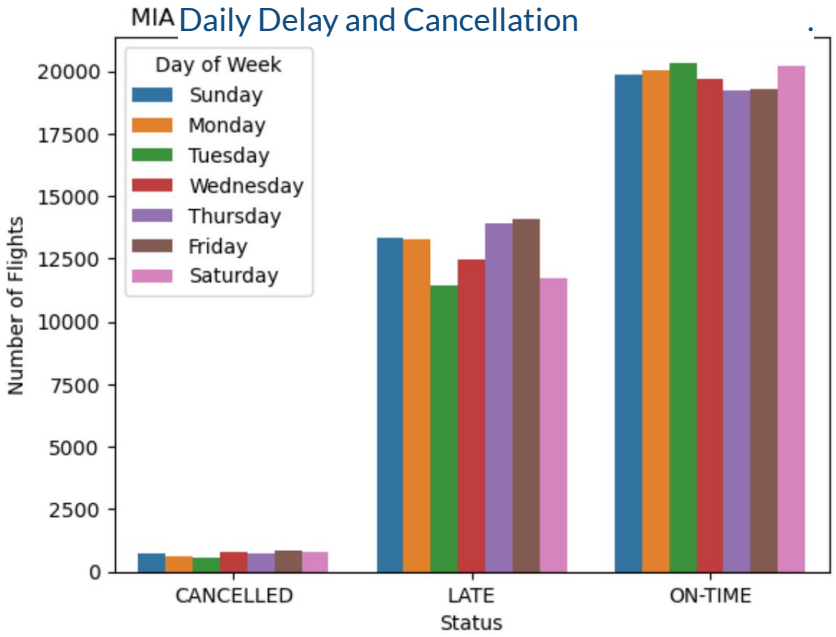


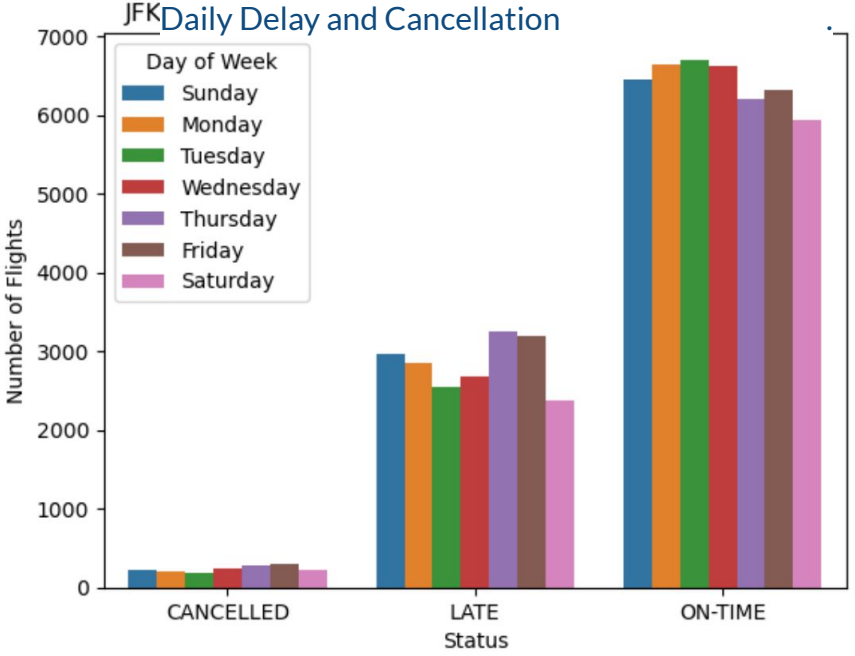


Insights

- **Higher Volume at MIA:** MIA handles a significantly higher volume of flights across all statuses compared to JFK.
- **Cancellation Patterns:** Both airports show low cancellation numbers, but JFK has a slight increase in the late evening.
- **Peak Delay Hours:** MIA experiences the most delays in the late afternoon to evening, while JFK's delays peak in the early evening.
- **On-Time Flights Distribution:** MIA's on-time flights are heavily concentrated in the early morning, whereas JFK has a more even distribution with a spike in the late evening.
- **Late Evening Trends:** Both airports show an increase in on-time flights during the late evening, indicating successful flight management despite potential delays earlier in the day.

Lets Compare!





Insights

- **Volume of Operations:** MIA shows a higher volume of flights in all statuses compared to JFK, with both airports experiencing the most on-time flights on Fridays.
- **Cancellation Trends:** Cancellations are relatively low for both airports throughout the week, with no significant spikes on any particular day.
- **Late Flights:** For both MIA and JFK, late flights are fairly consistent across the week, with a slight increase on Fridays.
- **Consistency in On-Time Flights:** On-time flights at MIA and JFK show consistency across the week, with Friday being the busiest day.
- **Weekend Comparisons:** The weekend (Saturday and Sunday) shows a lower number of flights for both airports, which correlates with fewer delays and cancellations.

Conclusion

- **Delay Distribution:** While JFK has higher cancellations, its distribution of delays is more even, suggesting that when flights are not canceled, the airport manages delays throughout the day efficiently.
- **Operational Volume vs. Cancellation Impact:** Despite MIA's higher volume of flights, its cancellation rate is lower than JFK's, which could be seen as an indicator of MIA's resilience or more effective scheduling under pressure.
- **On-Time Performance:** Both airports perform well in terms of on-time departures, with MIA managing a greater number of on-time flights due to its larger scale of operations.
- **Efficiency Assessment:** Considering the complexity of airport operations, MIA's lower cancellation rate with a higher volume of flights could suggest a relative efficiency advantage. However, JFK's management of delays, outside of cancellations, also reflects operational competence.