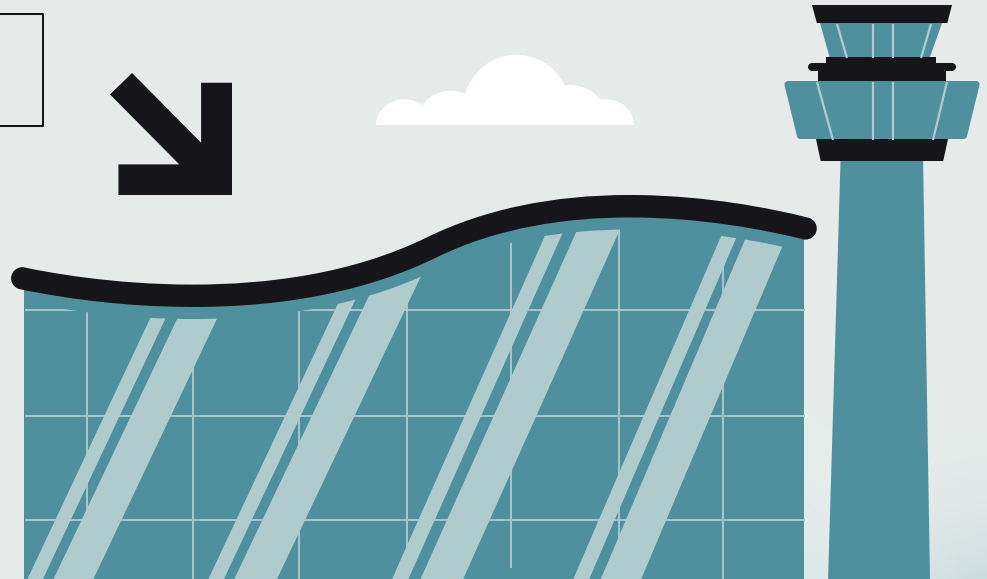
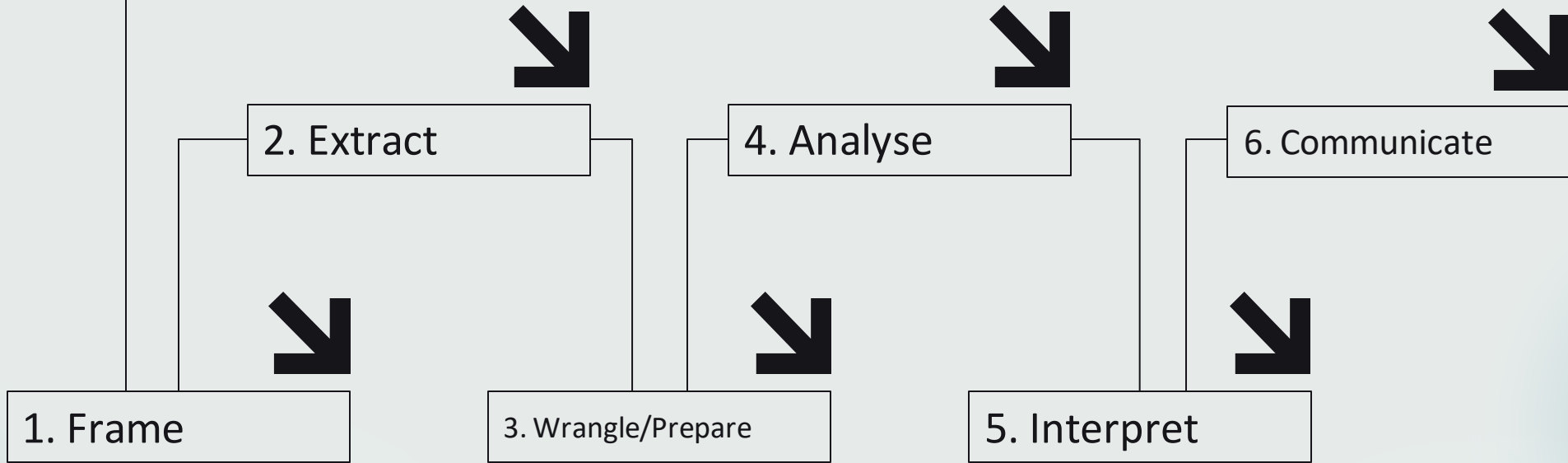


Flight Delays Analysis V2

M. Farhan Rais
DAS 311



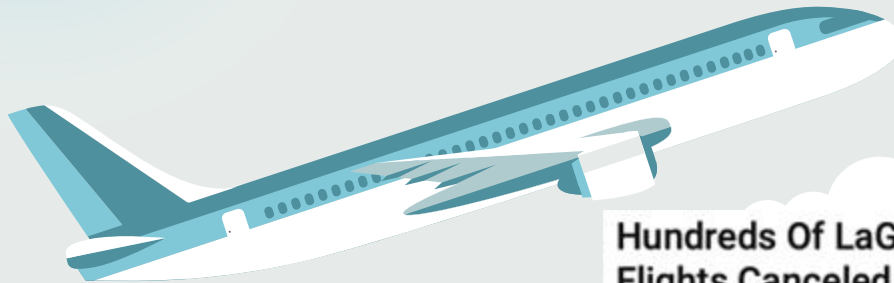
Contents/Data Analytics Workflow





01

Frame



Hundreds Of LaGuardia, JFK Flights Canceled, Delayed

LaGuardia saw more than 175 flights delayed Friday morning as snow descended on New York City, according to FlightAware.



Colin Loesch, Patch Staff

Posted Fri, Jan 16, 2024 at 11:03 am ET | Updated Fri, Jan 16, 2024 at 11:57 am ET

Background



Flight delays at JFK Airport

** Delay: > 15 mins*

<https://patch.com/new-york/queens/more-80-laguardia-flights-canceled-nearly-100-delayed>



GA



Problem Statement

JFK Airport is experiencing high volumes of flight delays. Department of Transport has put together data of domestic flight information for in-house analysts.

How might the **DoT data analyst** use **flight data** to analyse trends in flight delays and make recommendations to JFK Airport management in order to **improve flight departure times**?





02

Extract

US DoT BTS Dataset

On-Time : Reporting Carrier On-Time Performance (1987-present)

- Flight information from **New York** in **2023** by month.
- No. of rows: 727,846

Python

- Combine all 12 months' CSV files.
- Filtered to flights originating from **JFK Airport**.
- No. of rows: 133,048

https://www.transtats.bts.gov/DL_SelectFields.aspx?gnoyr VQ=F GJ&QO fu146 anzr=b0-gvzr





03

Wrangle/Prepare

Wrangle/Prepare Data – SQLite

- Small, fast, self-contained, high-reliability, full-featured, SQL database engine.
- Simulate working with an actual Database and write SQL queries + check-out corresponding outputs.

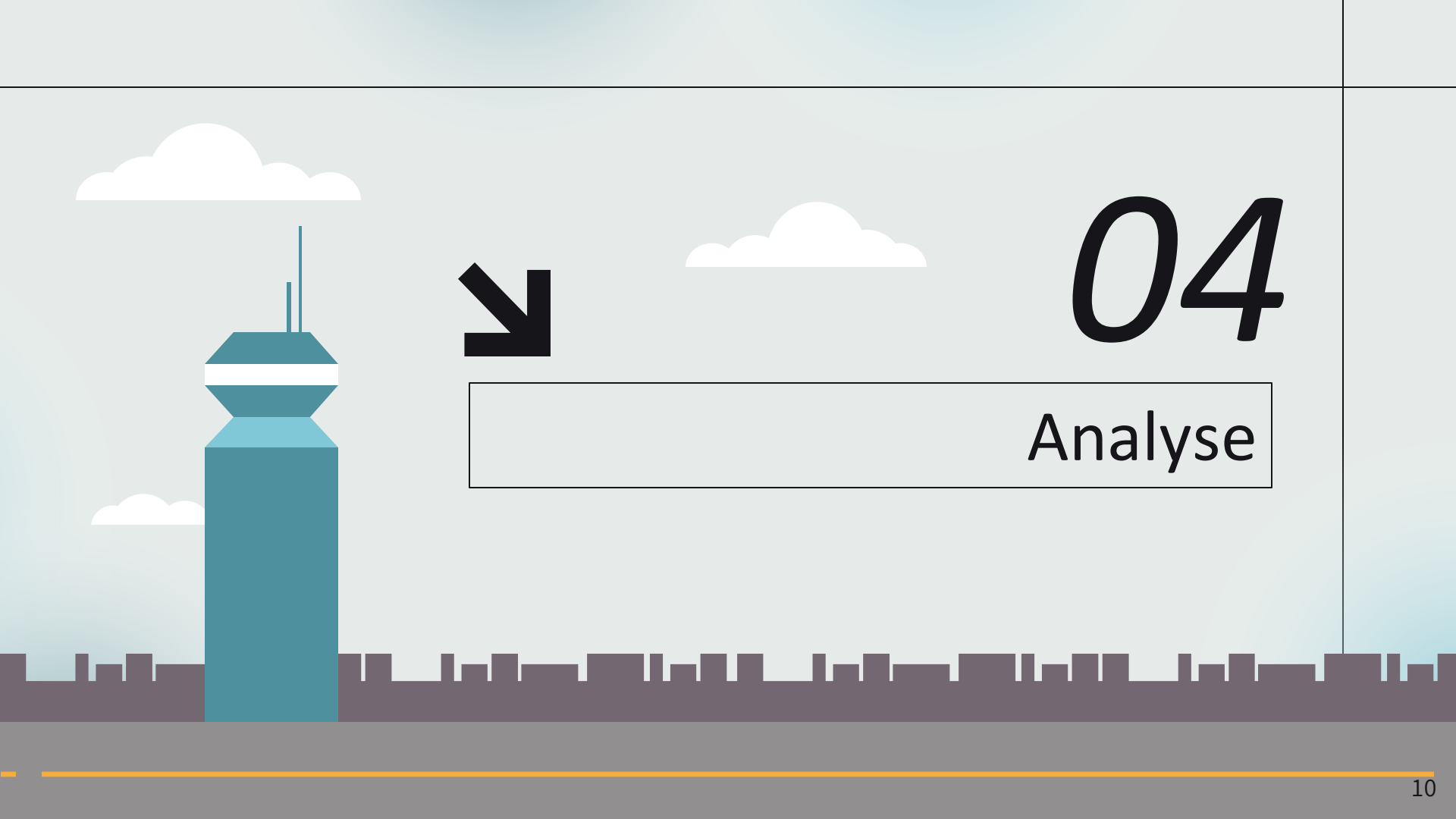
Steps taken:

- Create new SQLite db file.
- Store the df into the db file.

```
1 # Preview the top 5 rows of the table
2 sql_query = '''
3 SELECT *
4 FROM jfk_delay
5 LIMIT 5
6 '''
7 pd.read_sql(sql_query, con)
```

[14] ✓ 0.0s Python

| | year | quarter | month | day_of_month | day_of_week | fl_date | op_unique_carrier | origin | dest | dep_delay | dep_delay_new | dep_del15 | c |
|---|------|---------|-------|--------------|-------------|----------------------------|-------------------|--------|------|-----------|---------------|-----------|---|
| 0 | 2023 | 1 | 1 | 1 | 7 | 1/1/2023 12:00:00 AM | 9E | JFK | CLE | 19.0 | 19.0 | 1.0 | |
| 1 | 2023 | 1 | 1 | 1 | 7 | 1/1/2023 12:00:00 AM | AA | JFK | AUS | 161.0 | 161.0 | 1.0 | |
| 2 | 2023 | 1 | 1 | 1 | 7 | 1/1/2023 12:00:00 AM | AA | JFK | MIA | 26.0 | 26.0 | 1.0 | |
| 3 | 2023 | 1 | 1 | 1 | 7 | 1/1/2023 12:00:00 AM | AA | JFK | MIA | 64.0 | 64.0 | 1.0 | |
| 4 | 2023 | 1 | 1 | 1 | 7 | 1/1/2023 12:00:00 AM | AS | JFK | SFO | 42.0 | 42.0 | 1.0 | |




04

Analyse



22.6%

30,085



Flights delayed in 2023



Summary Statistics

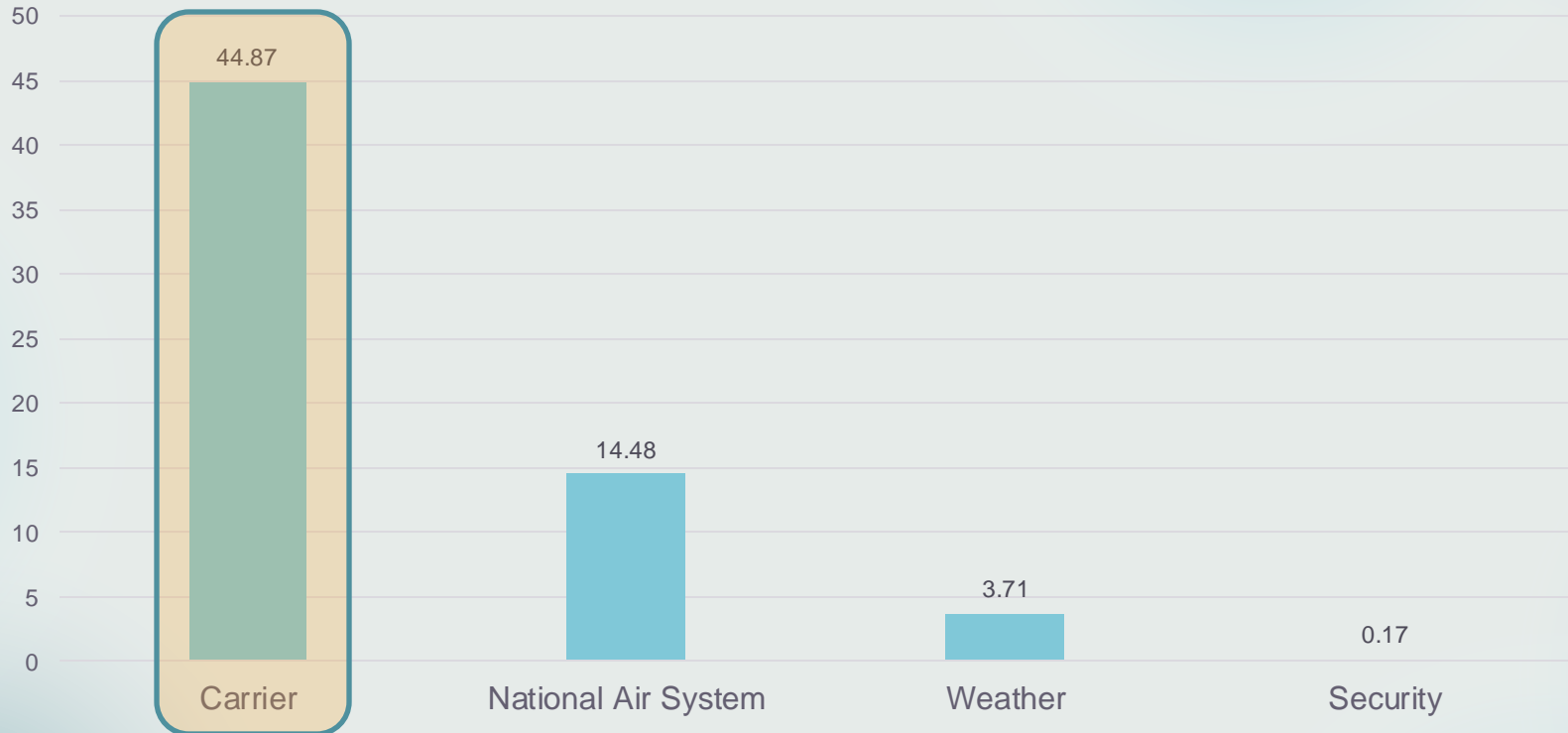
| Title | Quantity |
|--------------------------|----------------|
| Total flights | 133,048 |
| No. of flights delayed | 30,085 (22.6%) |
| Avg delay duration | 78 mins |
| No. of flights cancelled | 136 (0.10%) |



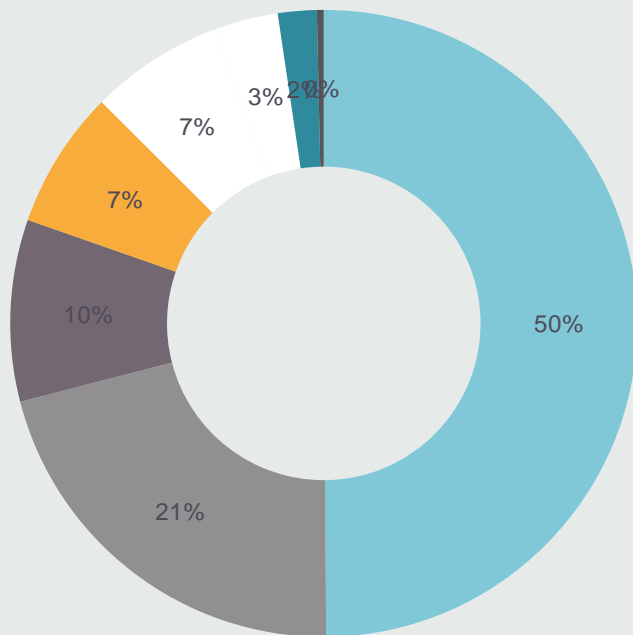
05

Interpret

Average Delay Duration by Cause



Delays by Airline

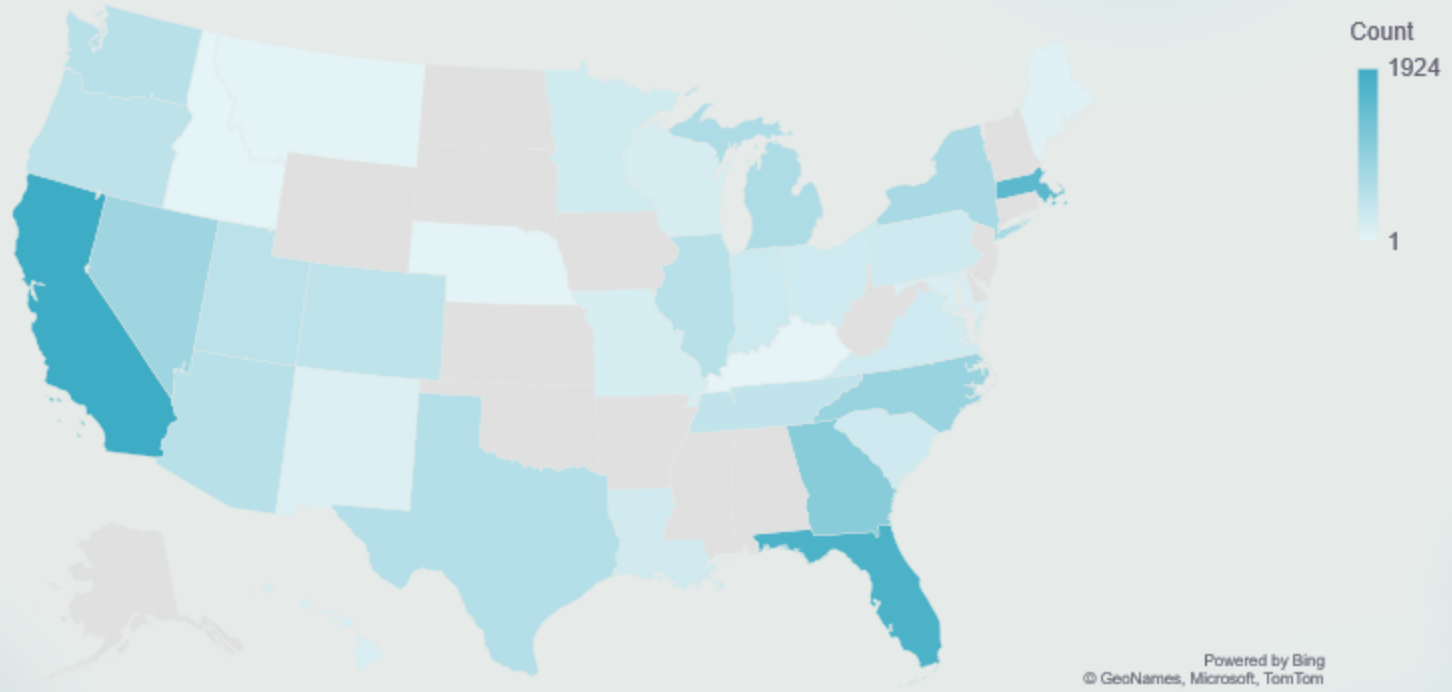


- JetBlue Airways
- Delta Air Lines Inc.
- Endeavor Air Inc.
- American Airlines Inc.
- Republic Airline
- SkyWest Airlines Inc.
- Alaska Airlines Inc.
- Hawaiian Airlines Inc.

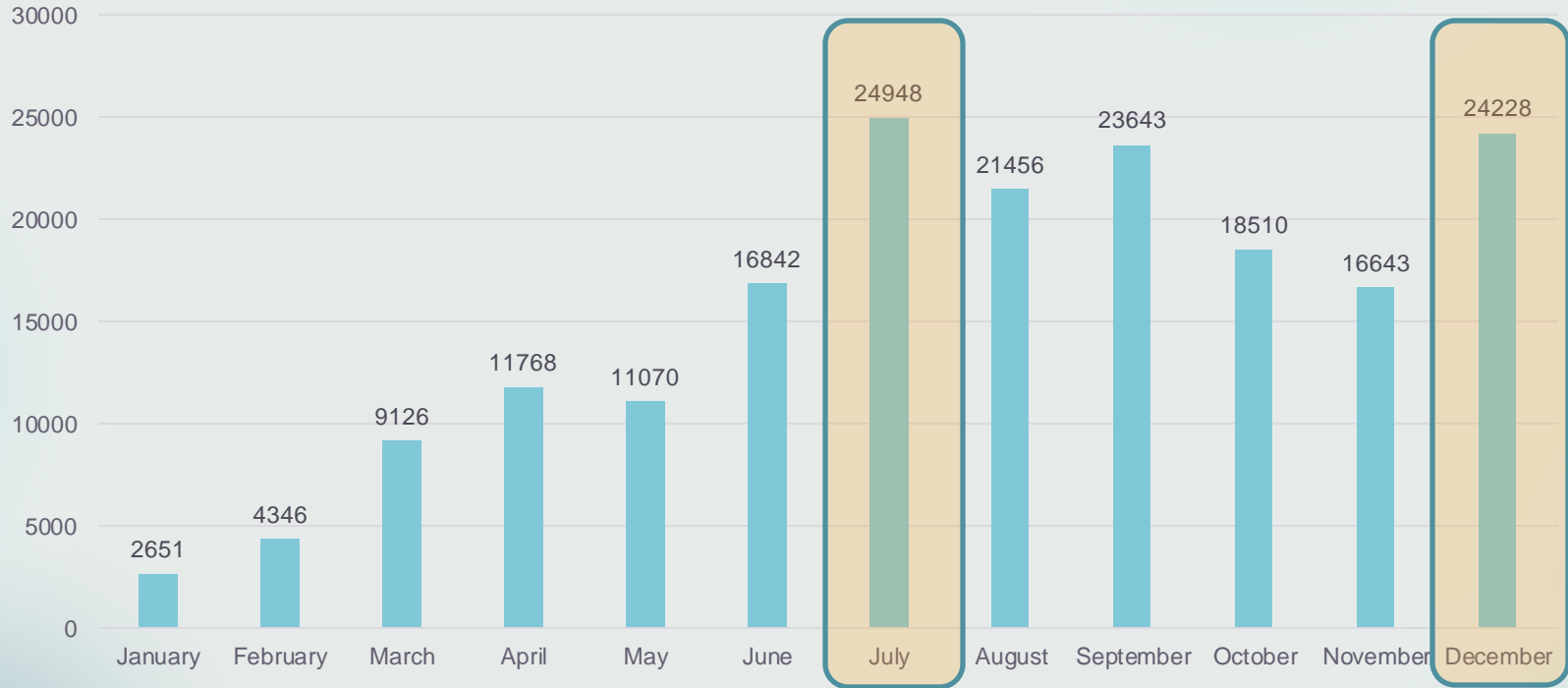
Delays by Destination



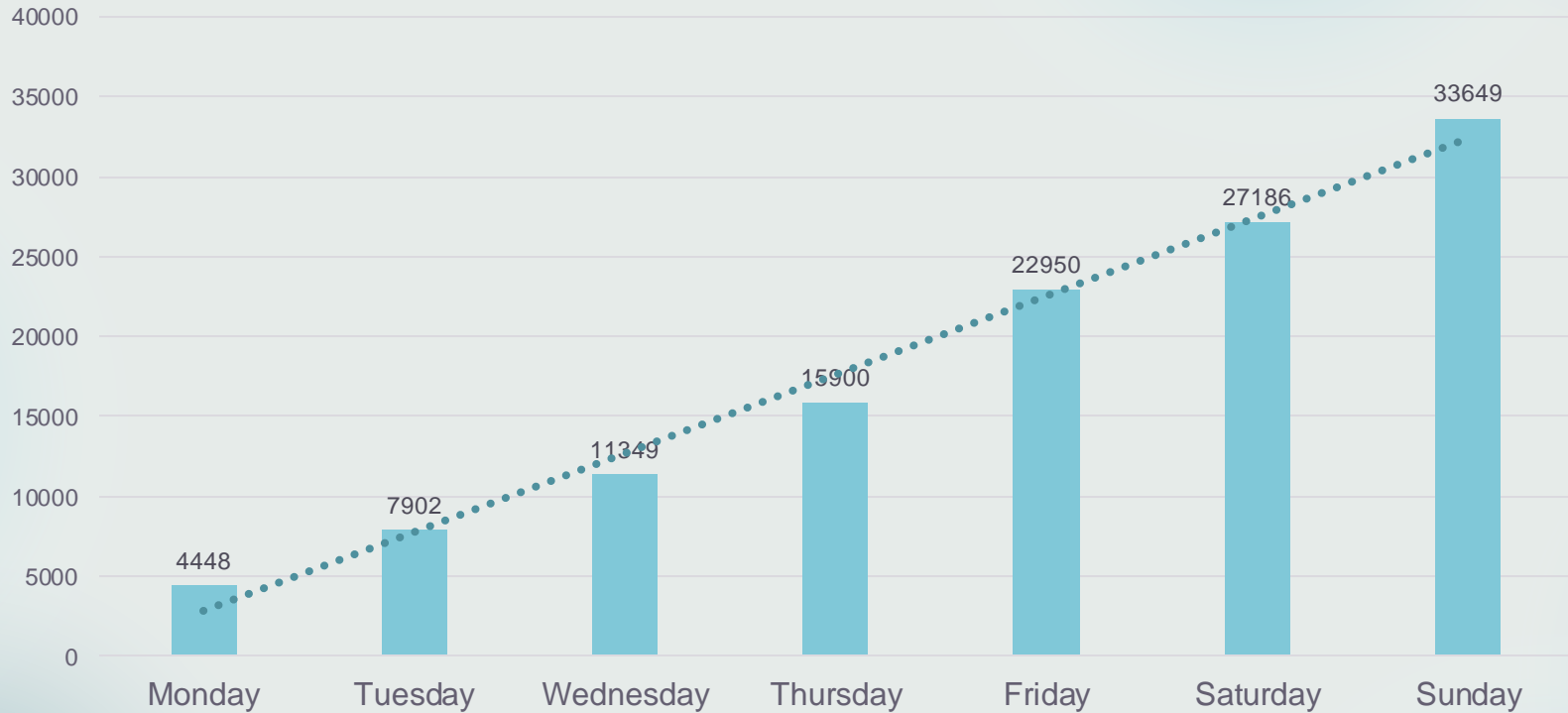
Delays by Destination



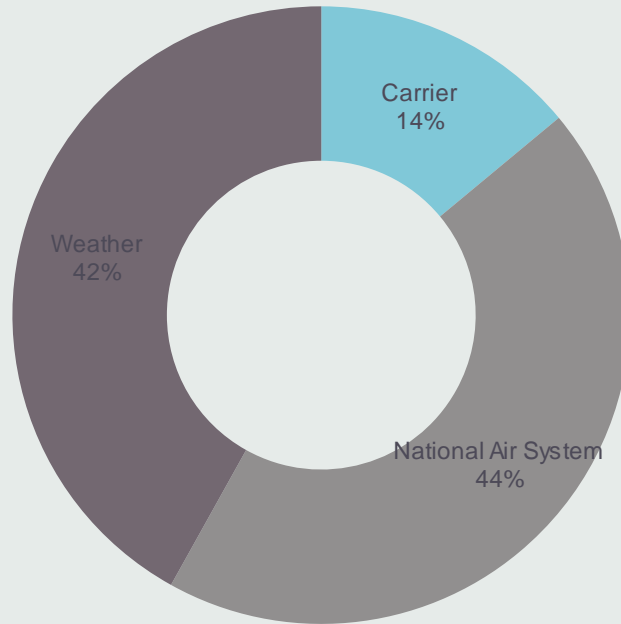
Seasonality – Months



Seasonality – Day



Cancellation Reason





06



Communicate

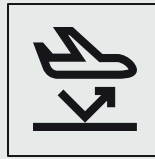
Recommendations



Airline

Penalise repeat offenders

- Based on average threshold (78 mins)



Destination

Travel advisory

- Publish expected delays by destination



Seasonality

Adjust staffing requirements

- July and December
- Weekends

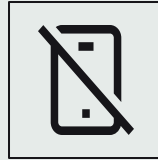
Future Work



Further Study

Full dataset/API

- International flights
- Across years



Prediction

Prediction model

- Time series
- Geospatial analysis



"Focus on the journey, not
the destination."

Chris Hadfield

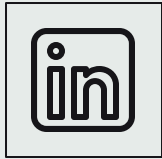
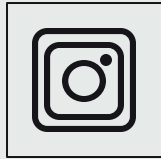
HANGAR

LIGHTS

<https://HangarFlights>

Thank You

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<https://generalassemb.ly/students>



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