Decoding Aircraft Emergencies

By: Gray Hardy, Matthew Bishop, Jack Cohen, Lauren To

AGENDA

1. Background
2. Approach
3. ETL Architecture
4. ERD Diagram
5. Data Wrangling
6. Decoding Aircraft Emergencies

Background

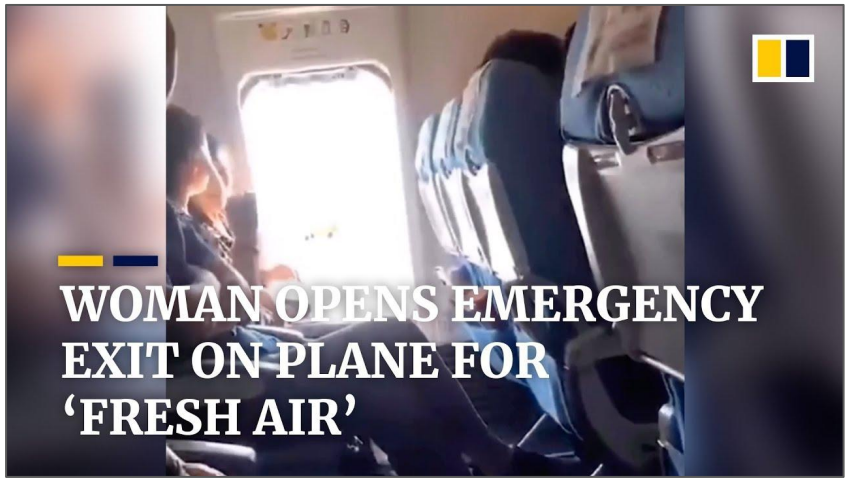
About

- Explore in-flight emergency air situations using squawk 7700 codes from OpenSky
  - Over 4.2 million rows of data from csv & parquet.gz files loaded into PostgreSQL.
  - Data spans flights seen by the network's 2500+ members between 1 January 2018 and 29 January 2020.
- Interactive visualization created using Javascript, SQLAlchemy, Flask & Heroku.

APPROACH

1. Identify data sources and dependencies
2. Collect and clean aircraft, emergency and flight trajectory data
3. Join 3 datasets on flight_id & icao
4. Load data in PostgreSQL using SQLAlchemy
5. Create Flask App and connect routes to PostgreSQL
6. Create charts using Javascript libraries
7. Customize html and css for final application
8. Visualize dashboard in Heroku

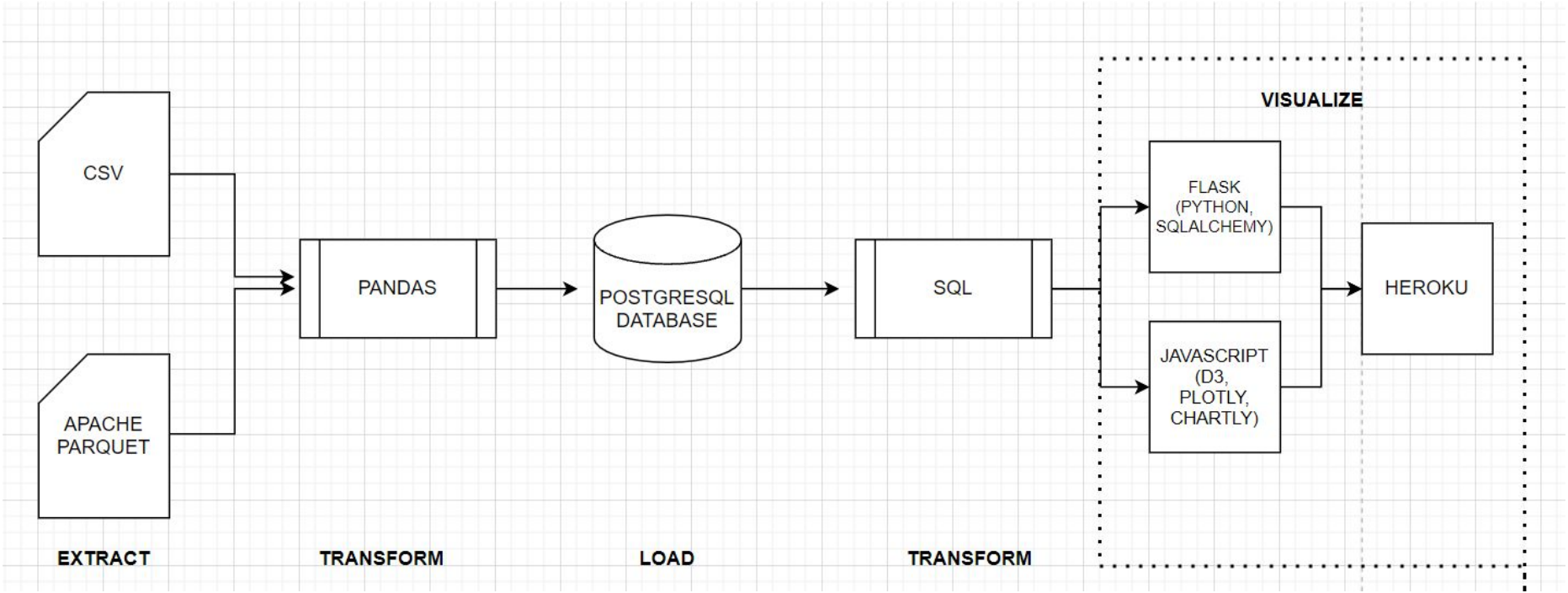
Approach



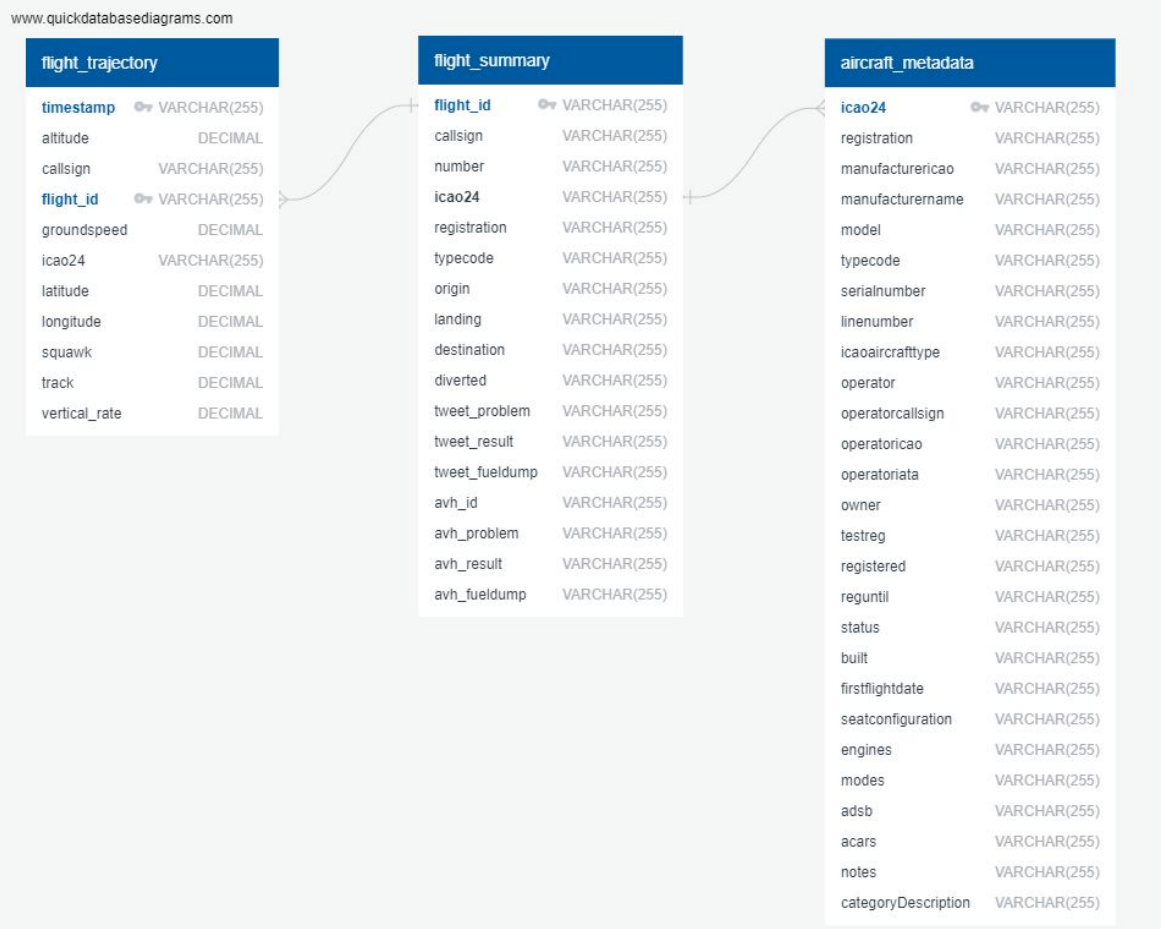
Limitations & Assumptions

- Limited time of project
- Flight data is from before Feb 2020
- Only 813 rows of squawk code 7700 data
- Assume data is correct

ETL Architecture



Aircraft ERD



Data Wrangling

Transformations

- Lowercase column names so that they can be loaded into postgresql
- Convert data types
- Remove null values and rows

DECODING AIRCRAFT EMERGENCIES

Analyzing Aircraft Emergencies

MOST FREQUENTLY USED SQUAWK CODE

Squawk 7700 is the squawk code for a general emergency. The first emergency code is Squawk 7500. 7700 is a code that is actually fairly commonly seen by Air Traffic Control.

Data Output | Explain | Messag

	squawk numeric	count bigint
1	7700	813
2	1000	93
3	5677	17
4	7407	10
5	5614	9

Visualizations

Visualizations

Visualizations

Visualizations

Conclusion

Ideas for Further Exploration

- x

Business Implications

- Airlines can use this data to…
- Customers can use this data to learn about frequent flight emergencies and select airlines with fewer emergencies

QUESTIONS?