# Web Dashboard with Plotly and Dash

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# Introduction

This application creates an interactive dashboard using Dash and Plotly. The purpose of the dashboard is to extract data on US domestic airline flights performance from the dataset “US airline reporting carrier on-time performance dataset” available at Data Asset Exchange. The extracted data can be used to analyze the performance of the reporting airline so that they can improve flight reliability, thereby improving customer reliability. Two types of yearly reports can be generated on this dashboard: performance report and delay report. Each report consists of five graphs plotted from the airline data of the year selected by the user.

# Dataset

The Reporting Carrier On-Time Performance Dataset contains information on approximately 200 million domestic US flights (2005-2019) reported to the United States Bureau of Transportation Statistics. The dataset contains basic information about each flight, such as date, time, departure airport, arrival airport, and, if applicable, the amount of time the flight was delayed and information about the reason for the delay, etc. The yearly performance reports generated from this dataset can be used to predict the likelihood of a flight arriving on time.

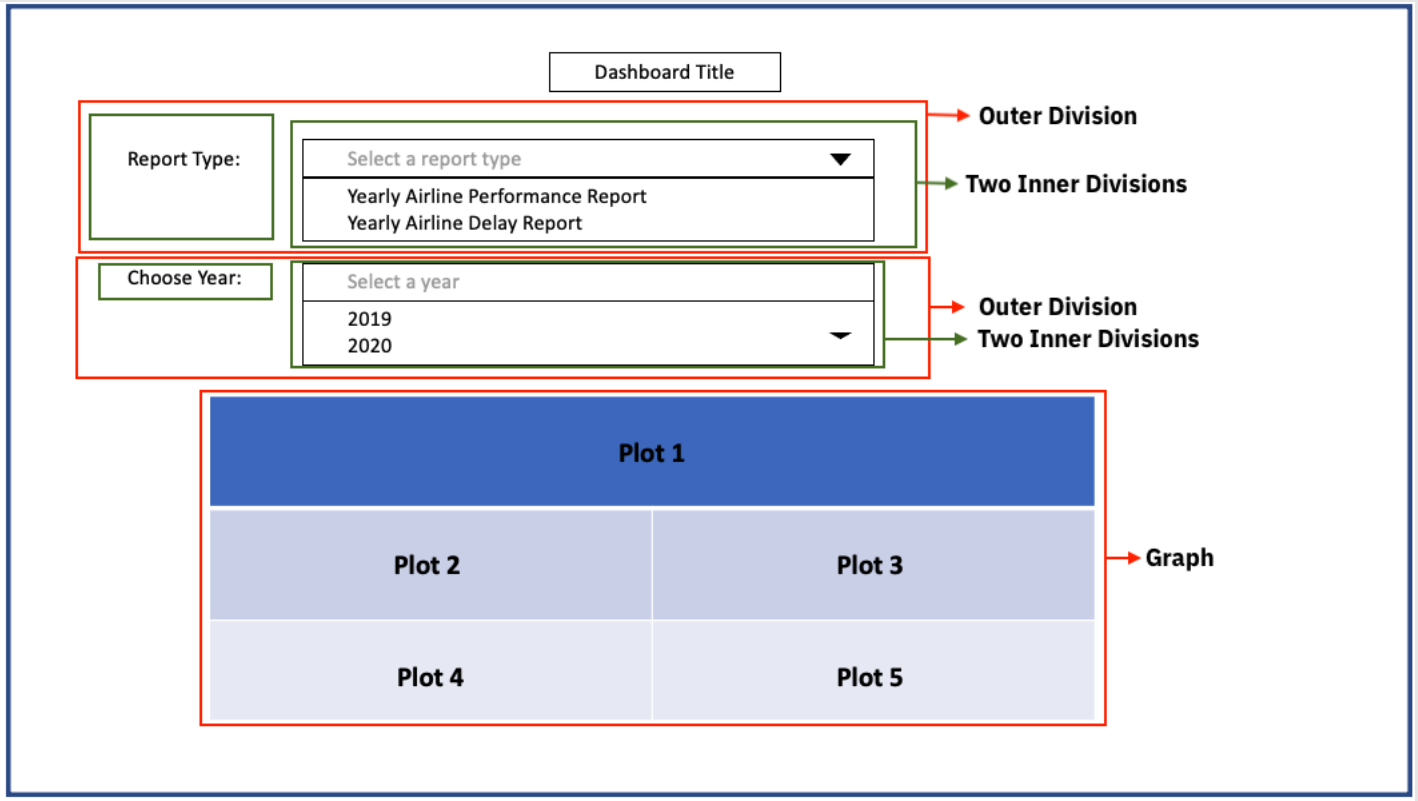
# Tasks

(In the order they appear in the application)

- Import required libraries
- Create a dash application
- Read the airline data into pandas dataframe
- Create a list of “years” included in the airline data
- Define functions to compute graph data for creating yearly airline performance reports
- Define the layout of the dash application
- Define the callback function
- Add the computation of the graph data to the callback function and return the graphs
- Run the app

**The code for creating the application is included in the folder of this PDF file.*

# Dash Application Layout



# Sample Performance Reports

- Plot 1

  ***treemap*** number of flights flying to each state from each reporting airline
- Plot 2

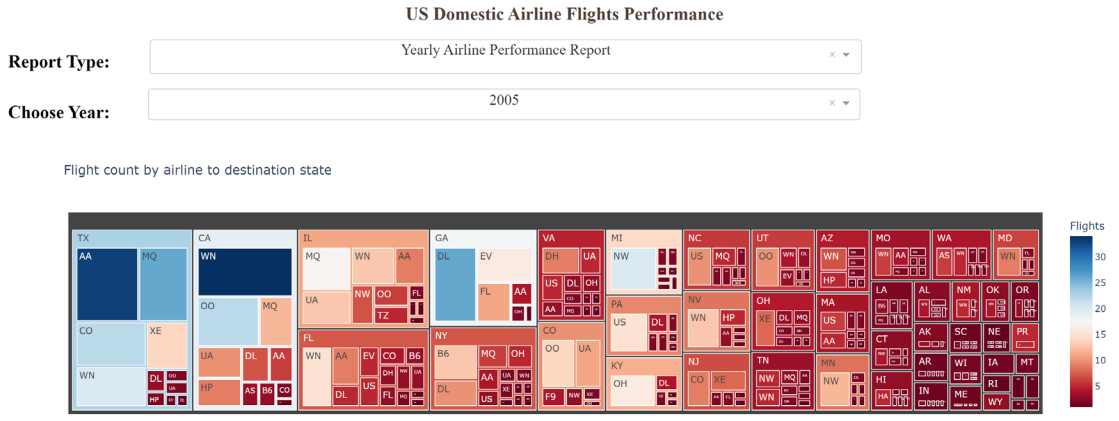
  ***pie chart*** percentage of diverted airport landings per reporting airline
- Plot 3

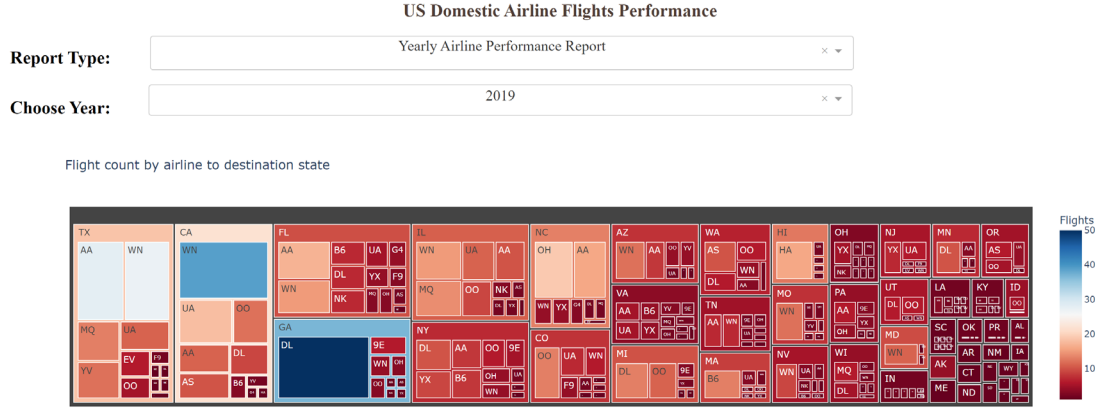
  ***choropleth map*** number of flights flying from each state
- Plot 4

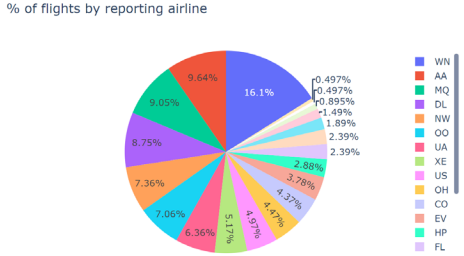
  ***bar chart*** number of flights under different cancellation categories
- Plot 5:

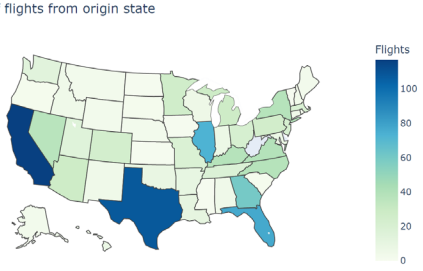
  ***line chart*** average flight time by reporting airline

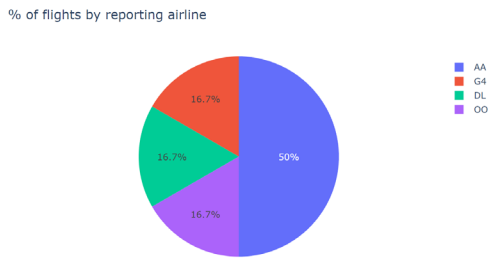
# Performance Reports (2005 and 2019)

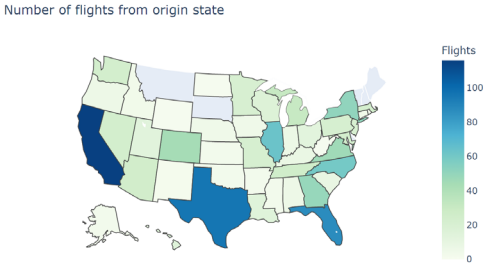


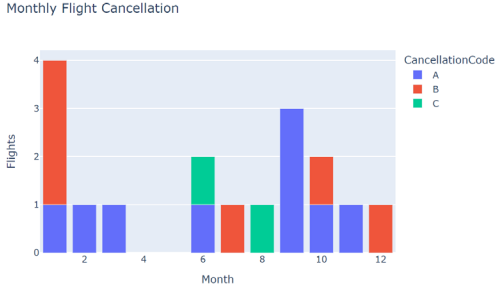



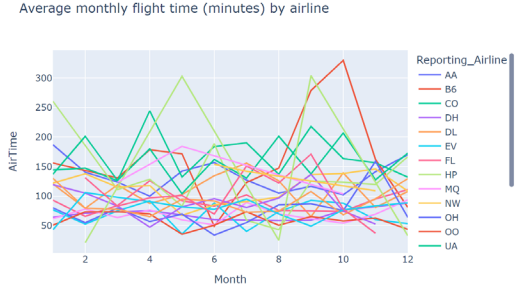



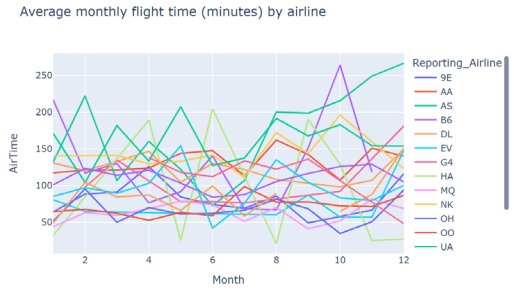







# Sample Delay Reports

***Line charts*** monthly average delay by reporting airline for the given year

- Plot 1 **carrier** delay
- Plot 2 **weather** delay
- Plot 3 **national aviation system (NAS)** delay
- Plot 4 **security** delay
- Plot 5 **late aircraft** delay

**Types of Delay** https://aspm.faa.gov/aspmhelp/index/Types_of_Delay.html#:~:text=Examples%20of%20occurrences%20that%20may,damage%20by%20hazardous%20goods%2C%20engineering

# Delay Reports (2005 and 2019)