Flights delay and Cancellation

- ## Context

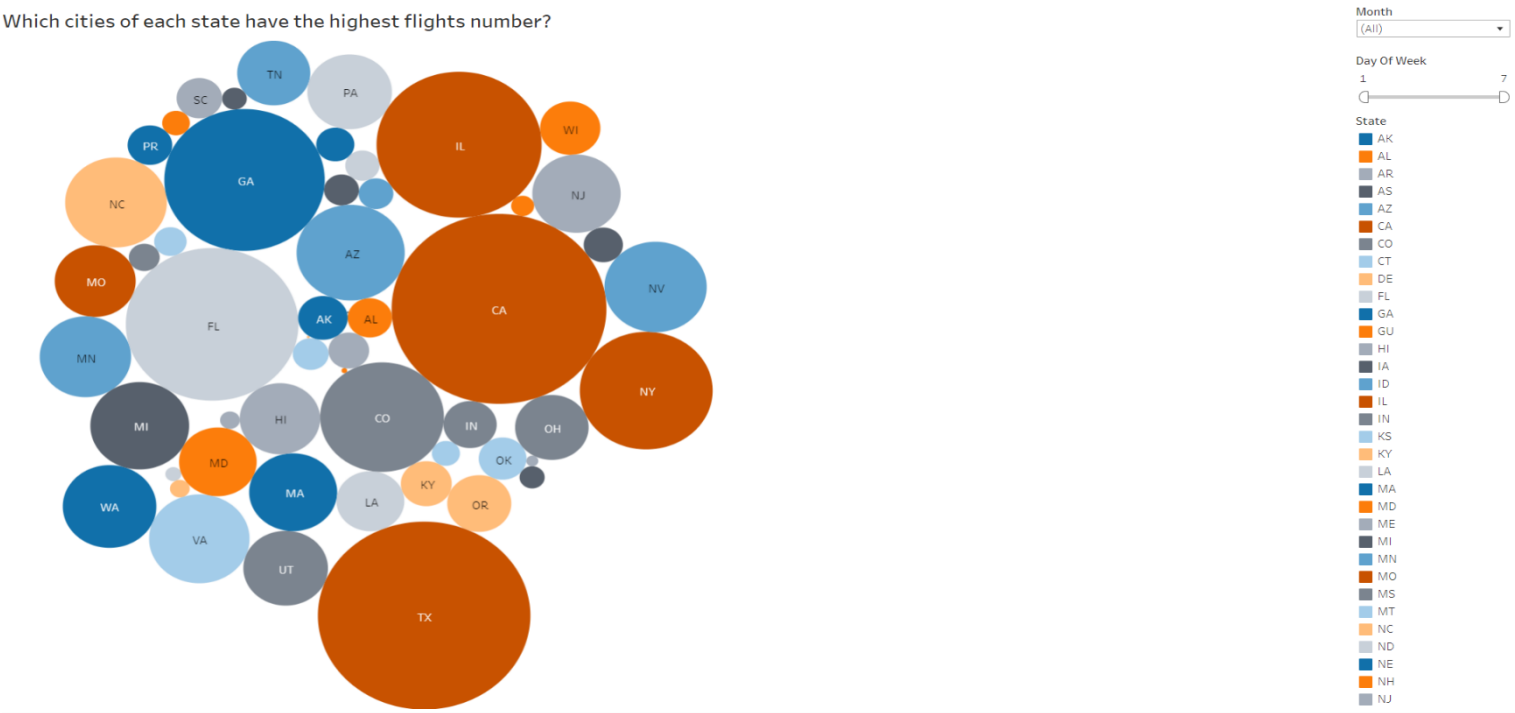
The U.S. Department of Transportation's (DOT) Bureau of Transportation Statistics tracks the on-time performance of domestic flights operated by large air carriers. Summary information on the number of on-time, delayed, canceled, and diverted flights is published in DOT's monthly Air Travel Consumer Report and in this dataset of 2015 flight delays and cancellations.

- ## Introduction

This section will be completed by analyzing flight data and integrating both airports and airlines with the first, extracting some visual plots that describe the problem of delayed and cancelled flights and discussing the major factors that affect flight lines, and taking any necessary action to address the problem. So, the next responses correspond to the visual plots, each with a summary, and in the end, there's a dashboard with a blend of the four plots.

- ## Visualization Part

1. Second Insight



- **Links:**
  https://public.tableau.com/views/f1_16469634006840/Numberofflights?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

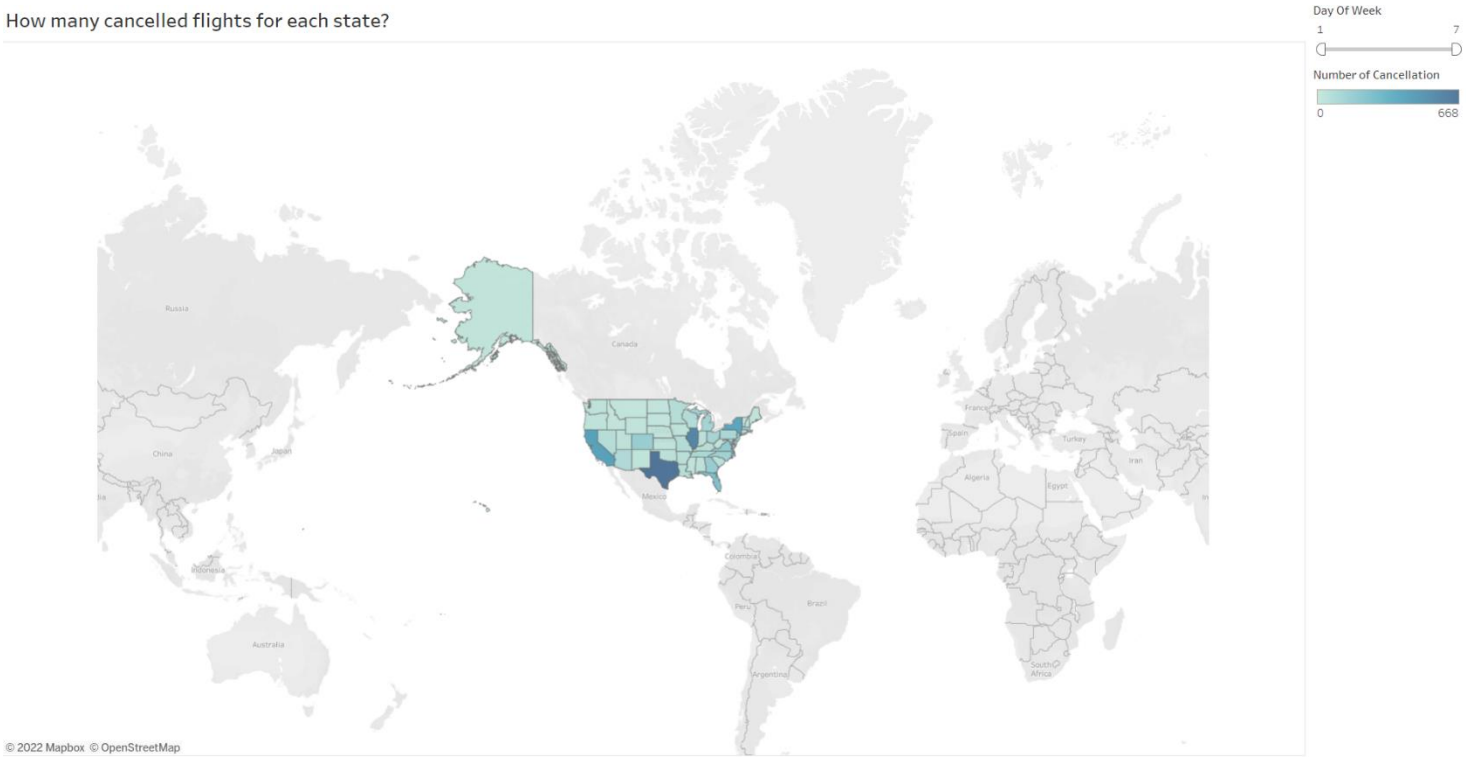
- **Summary:**
  As indicated in the graph above, CA has the most flights (33,331), followed by TX with (32,612), while AS has the fewest flights just (2).

- **Design:**

  The Bubble plot as shown, depends on the size of state with the flights number for bigger circles mean higher flights number and for small ones mean lower flights, with the month and day of the week as a filter to monitor the lag day by day, and the appropriate colors for all the bars to boost readability.

- **Resource:**
  https://www.kaggle.com/usdot/flight-delays/data

2. Second Insight



- **Links:**
  https://public.tableau.com/shared/CN674SH6Z?:display_count=n&:origin=viz_share_link

- **Summary:**

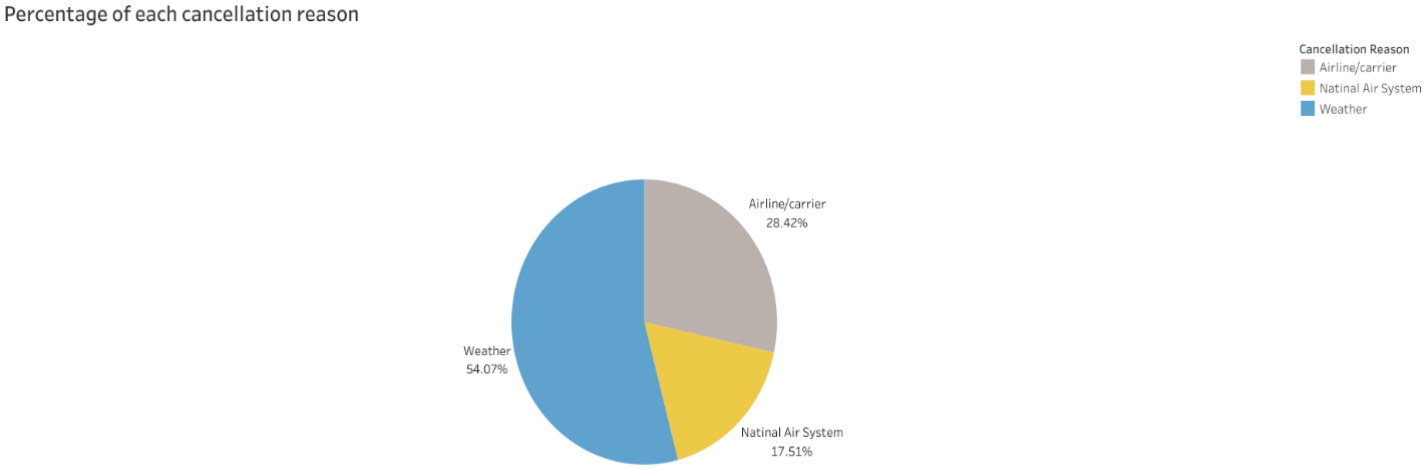
  When the results are studied by the legend of cancelled flights, where the dark blue hue indicates the most states with cancelled flights, it describes each Stated of the United States with its own unique number of cancellation flights throughout the whole year of 2015. Whereas TX has the most cancelled flights (668), the light hue denotes the states with the fewest cancellations flights, such as VI, GU, DE, and AS, which have none.

- **Design:**

  The study was conducted using a map view of the continent with data plotted in States of USA and numbers of cancelled flights using a blue hue to account for persons who are color blind.

- **Resource:**
  https://www.kaggle.com/usdot/flight-delays/data

3. Third Insight



- **Links:**
  https://public.tableau.com/shared/8C753G9QK?:display_count=n&:origin=viz_share_link

- **Summary:**

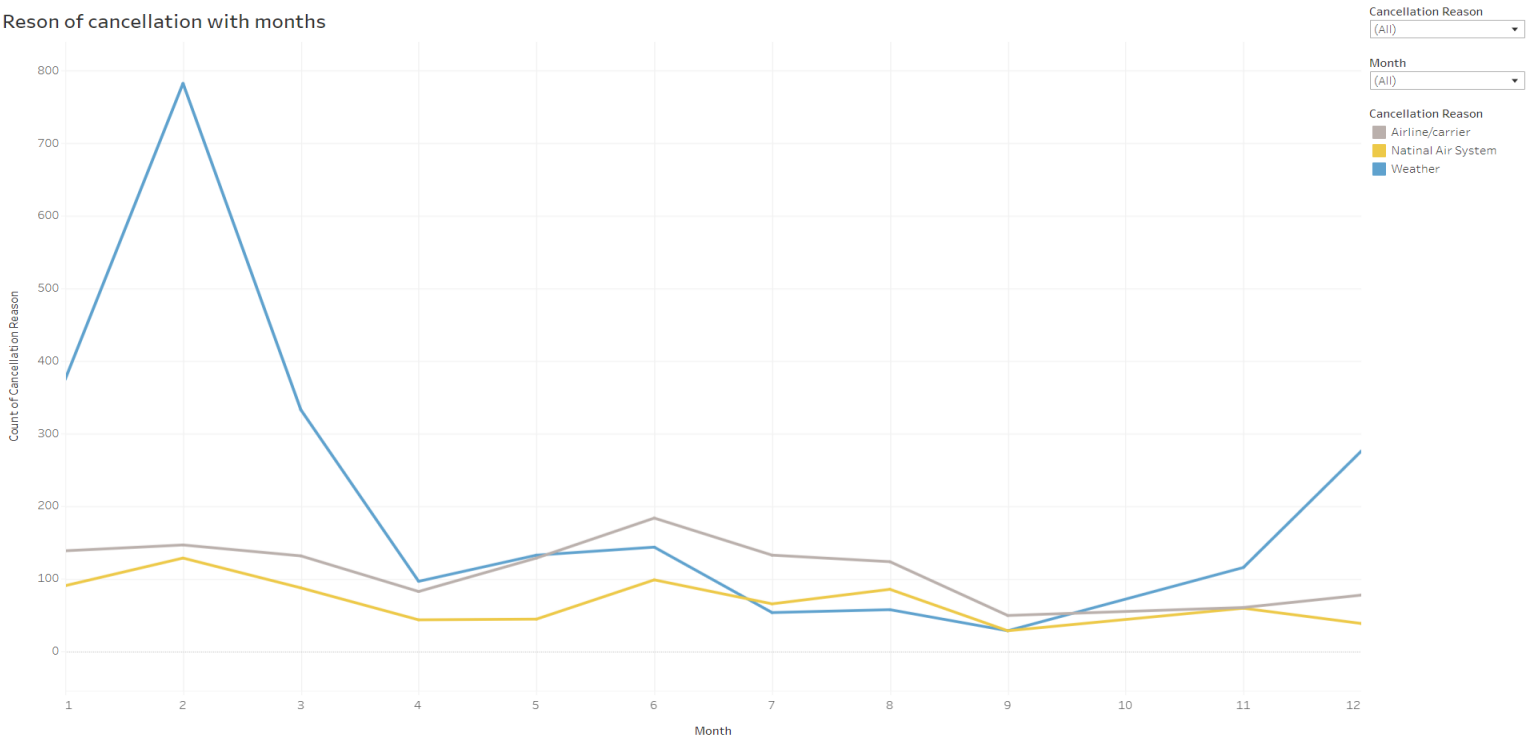
  From the previous plot, there is a dramatic change in the cancellation flights; by collecting some reasons that may affect this unwanted cancellation, this graph shows that the main reason for 54.07 percent of total flights cancellation is due to weather conditions, which accounts for about 2397 cancelled flights, followed by airline/carrier (1260) flights at 28.42 percent, and National Air System (776) flights at 17.51 percent.

- **Design:**

  Specifically, by utilizing a Pie chart to illustrate the percentages of each cancellation reason category with the number of cancelled flights, to indicate the major reason for flight cancellation, as shown, and by using pure colors in the legend of each reason to allow for colorblind people.

- **Resource:**
  https://www.kaggle.com/usdot/flight-delays/data

4. Fourth Insight



- **Links:**
  https://public.tableau.com/shared/5B3GJ7T3W?:display_count=n&:origin=viz_share_link

- **Summary:**

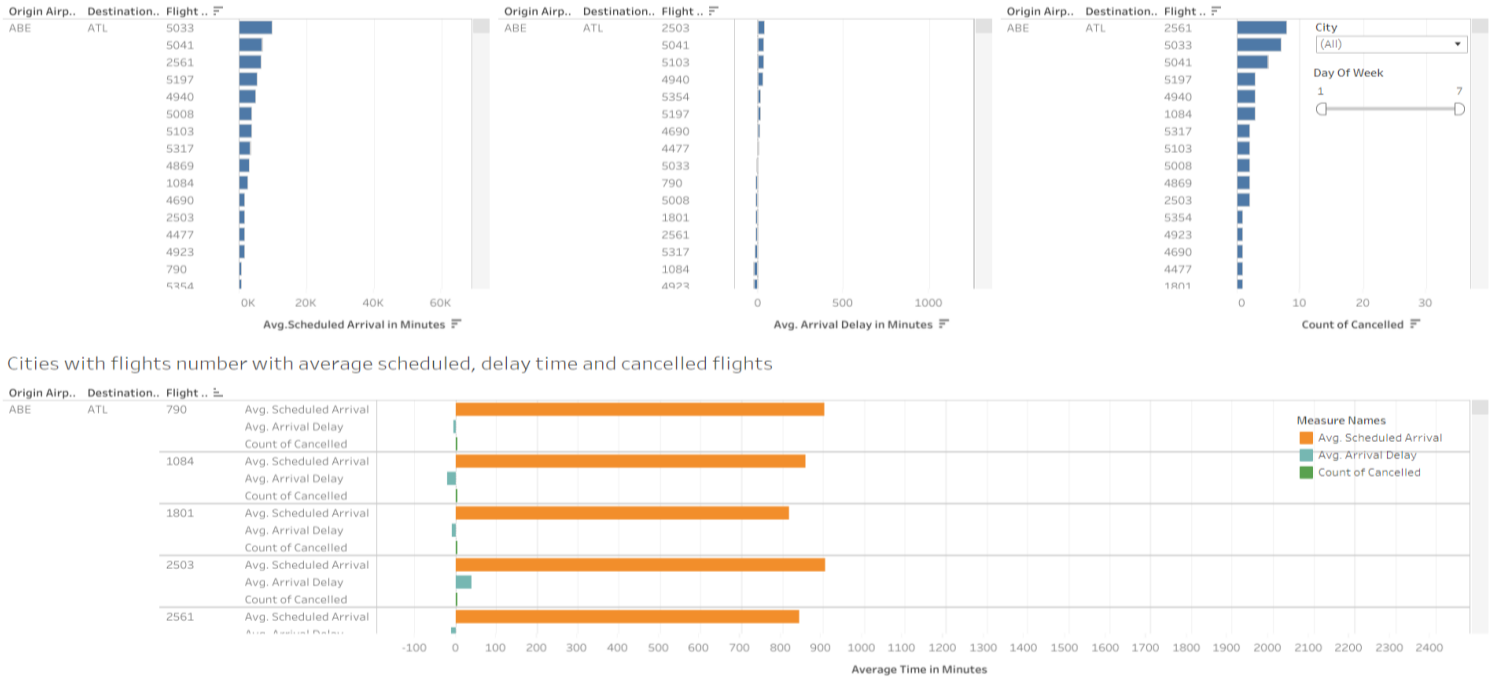
  As shown in the previous work, the impact of the year's months on the three main reasons for flight cancellation is shown in this graph. As shown above, there is a significant change in the line of weather problem between January and March, which are known as the winter months, then the line starts decreasing from April to September, then starts increasing again from September, indicating a strong relationship between the months of the year and the main reason for cancellation.

- **Design:**

  By using the month and cancellation reason as filters to check all the reasons together through the months or check each of them individually, the line chart provides a strong visualization between categorical data such as cancellation reason and quantitative data such as months, and by choosing the color to account for color blind people.

- **Resource:**
  https://www.kaggle.com/usdot/flight-delays/data

- ## Dashboard



- **Links:**
  https://public.tableau.com/views/f1_16469634006840/Dashboard1?:language=en-US&:display_count=n&:origin=viz_share_link

- **Summary:**
  Integration of average scheduled arrival time and average arrival delay, as well as flight cancellations at each city and aircraft destination one per flight number.

- **Design:**
  Each plot is a horizontal bar plot, while the integrating plot is a side-by-side bar plot with bright colors for colors blind people with filters for city and weekday.

- **Resource**
  https://www.kaggle.com/usdot/flight-delays/data

- ## Conclusion

Four insight plots that were used to determine the primary reasons for flight cancellations in the United States, as well as the states with delayed arrival. By employing:

1-Bubble plot.
2- Map View.
3-Pie Chart.
4-Line Chart.

The dashboard for analyzing scheduled arrival time and average arrival delay, as well as flight cancellations of aircraft destination at each city with flight's number.