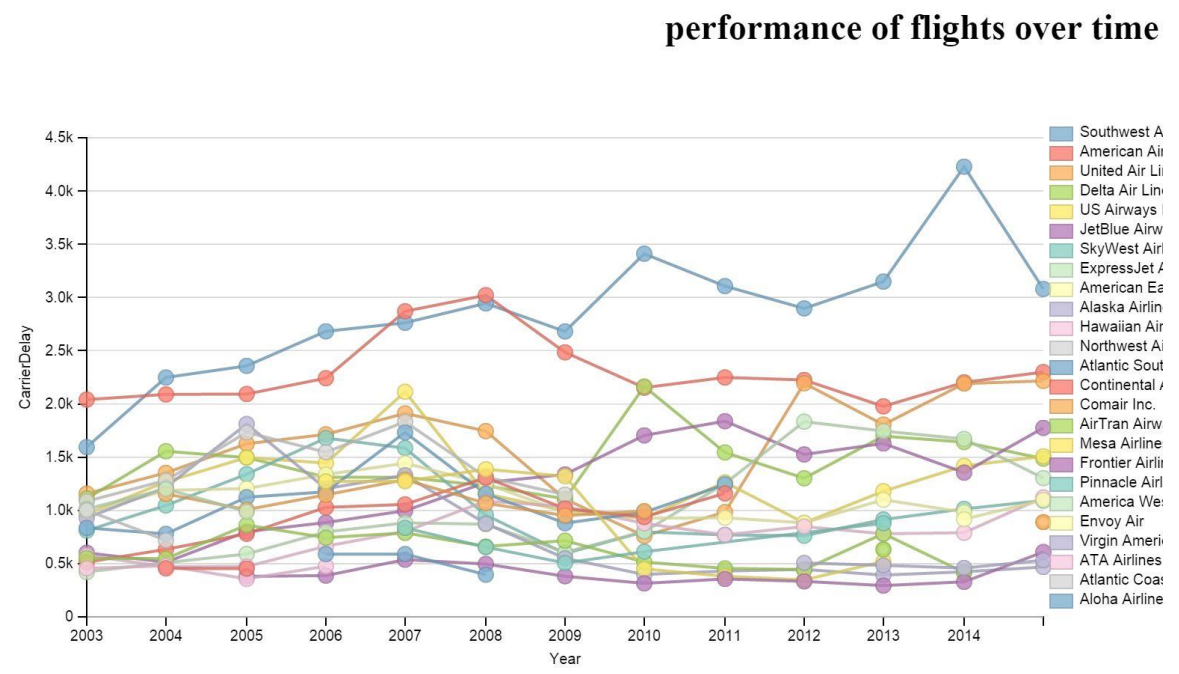


# Performance of US Domestic Flights from 2003 to 2015

By – Rohit Sharma

# INITIAL ANALYSIS:-

EDA Below chart shows my initial run to display the performance of US domestic flights in terms of their carrier delay. As you see, x shows the years and y shows average carrier delay based on minutes. Each line in the diagram shows the performance of a carrier.



This is such a busy figure and obviously it is not efficient in delivering analysis. For the next step, I will pick only 6 airlines based on the arrival flights number. For the rest of this project I will only analyse and visualize data related to top largest air carrier at US.

# Final Visualizations

Now, we have all the performance information for following air carriers which are in fact the top largerst US domestic air carriers:

```
## [1] "American Airlines Inc."    "Delta Air Lines Inc."
## [3] "ExpressJet Airlines Inc."  "SkyWest Airlines Inc."
## [5] "Southwest Airlines Co."    "United Air Lines Inc."
```

In this project the objective is to:

- Comparing the performance of Delta Air Lines Inc. with Other Carriers

In fact, during last five years **Delta Air Lines Inc.** has outperformed other US domestic carriers as it has less delay. More specifically:

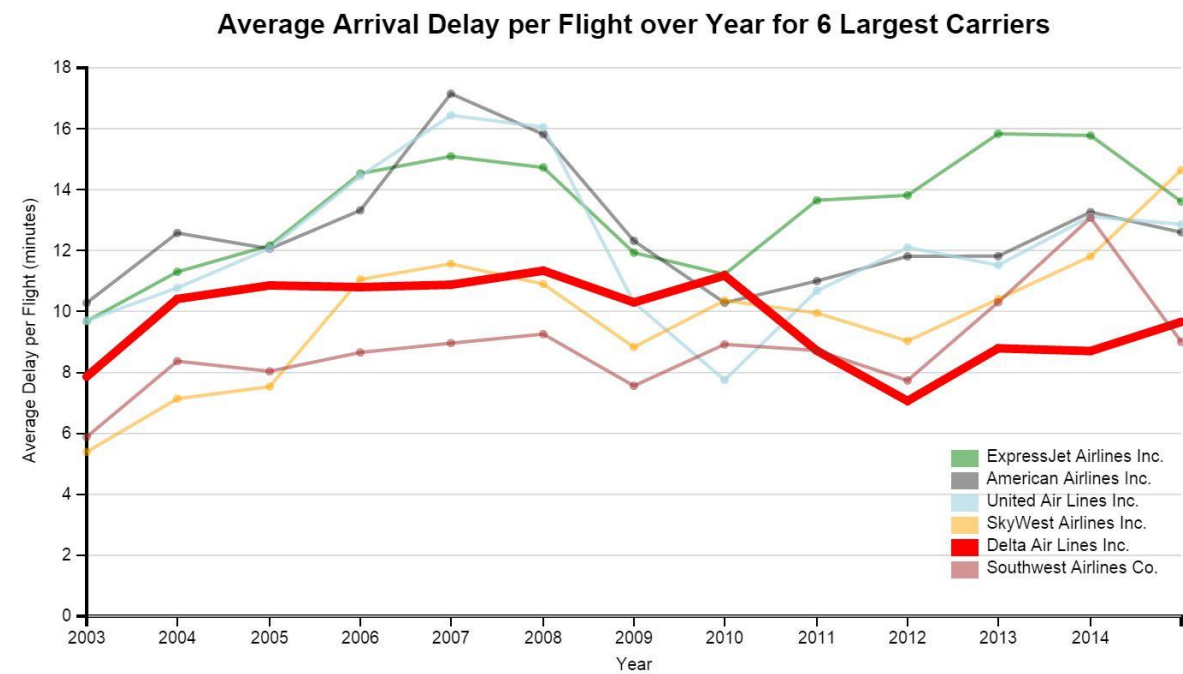
- Delta Air Lines is now one of the best US carriers in terms of flight delay percentage
- It had less overal and carrier delay comparing to other airlines

To show the performance of carriers, I will aggregate data by *year* and *carrier name* and then I will add new features that are required to do above analysis.

To display the delay metrics over time, I will use combination of point (scatter plot) and line chart. Using point, I can precisly display the measure and audience can easily compare. Also, I will add lines to be able to show trends of the performance over year. This makes it easy to see how performace of each carrier changed over time.

# Average Delay

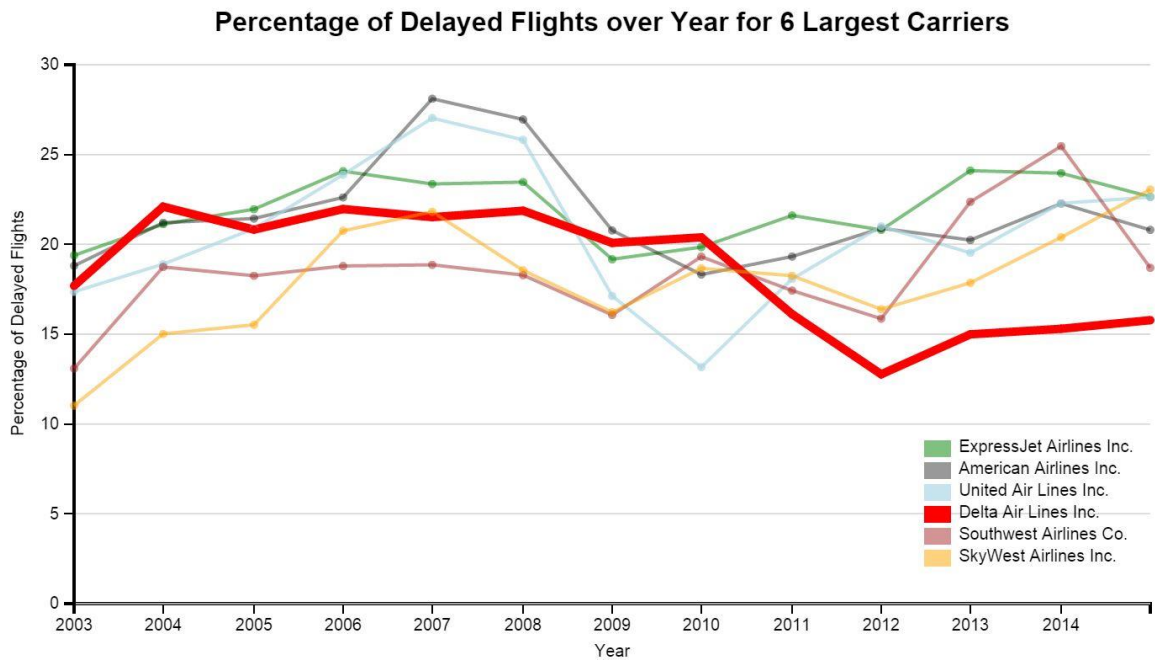
Following figure shows how the average delay changed over time for each of the carriers.



As you can see the average delay per flight fluctuated between 5 and 17 mins. Over the last 4 years Delta Air Lines had the lowest delay comparing to other carriers.

# Percentage of Late Flights

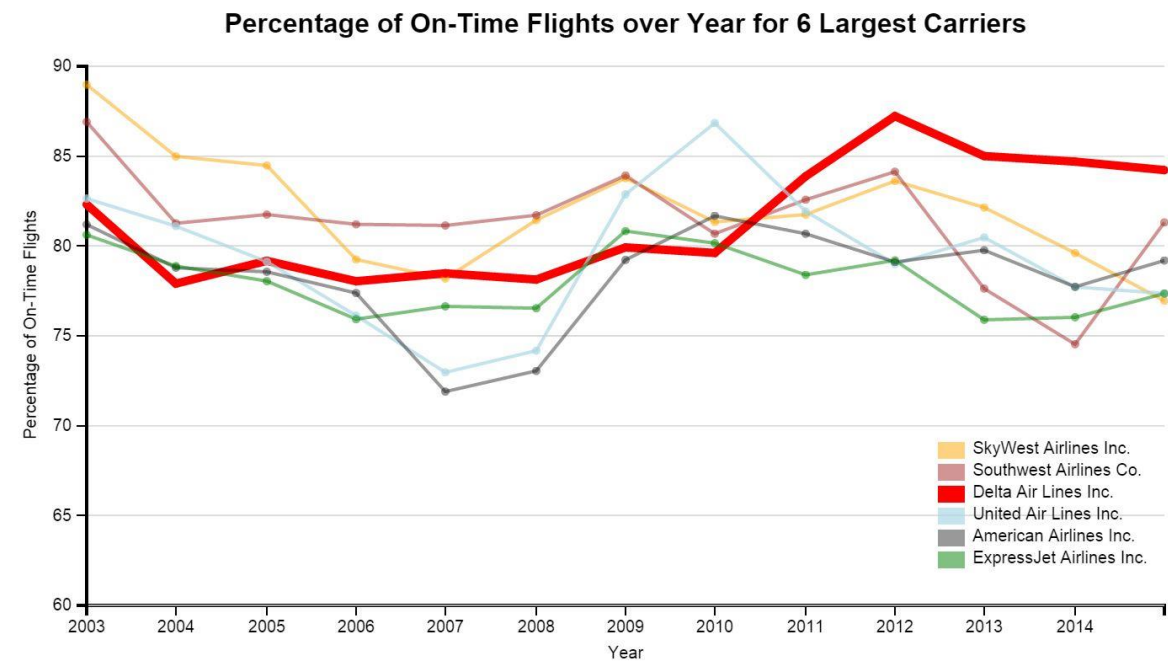
Following figure shows percentage of late flights for each of the carrier. A flight is marked as late when it reaches its destination with delay of more than 15 minutes.



Based on the diagram, the percentage for late flight is in range of 10 to 30%. As we can see in the line chart, Delta Airlines is doing very well comparing to other carriers in this department, especially for the last five years the percentage of its late flights is significantly lower than other carriers'.

# Percentage of On-Time Flights

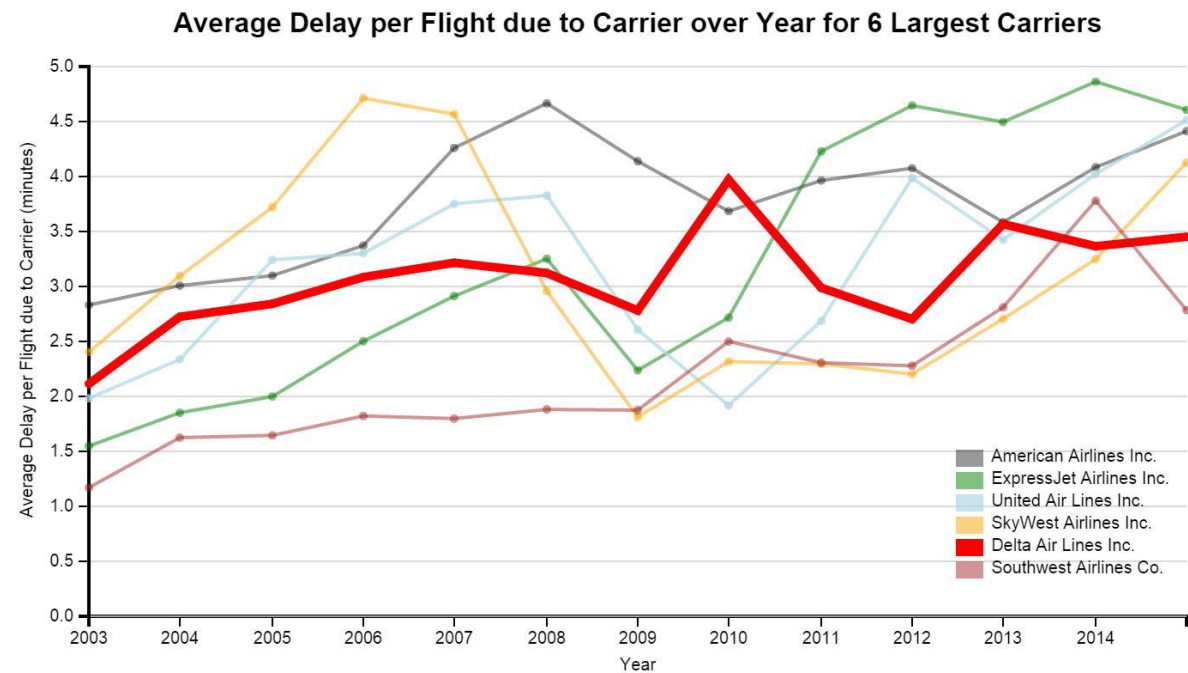
Following figure is very similar to the previous figure. This one displays the on-time flights while the last one was showing the late flights.



# Average Delay due to Carrier

Delay in flights can come from different sources, such as carrier, security check, weather and etc. In following two figures we focus on only those delays which are due to carrier.

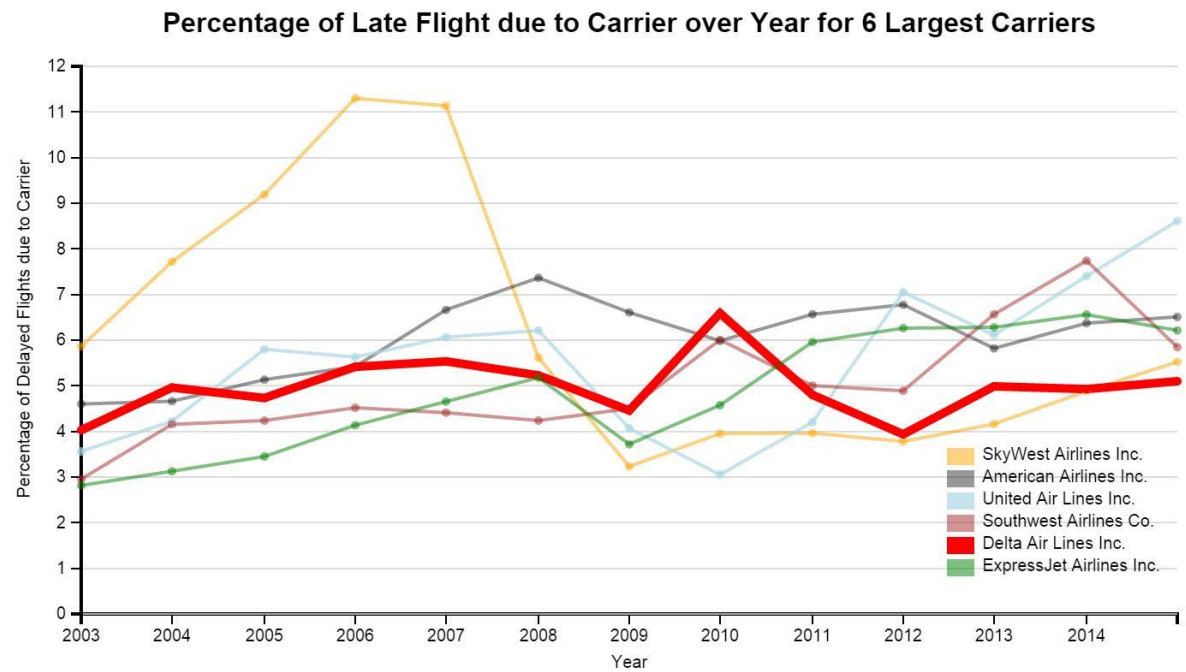
Following figure displays the average delay due to carrier per flight.



As you can see, ExpressJet have had the highest delay for the last five years, while Southwest Airlines, Delta and Skywest Airlines were among the lowest in this category

# Percentage of Late Flight due to Carrier

Following figure shows the percentage of flights that are late due to carrier.



As you can see Skywest was one of the worst between 2003-2008 but they managed to be one of the best for last 8 years. Also Delta Airlines is among the best for this category.



# References

- [dimple.js Documentation](#)
- [Data Visualization with d3.js course at Udacity](#)
- [Posts in Stack Overflow](#)
- <http://www.transtats.bts.gov/>

## Data Source

Data is taken from the following website

: [http://www.transtats.bts.gov/OT\\_Delay/OT\\_DelayCause1.asp?pn=1](http://www.transtats.bts.gov/OT_Delay/OT_DelayCause1.asp?pn=1)

data/airlines.csv contains the original data data/summary\_airlines.csv contains the cleaned and summarized data which was used for the project