

# What Airlines Would You Avoid for Your Next Flight?

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## Introduction

Taking an airplane is one of the most important and efficient ways to travel. However, many travelers have experienced delayed flight. Which airline carriers delayed most often? Which airports have highest probability to make you wait for a long time? Also, which day of week and which month of year are better for your journey without severe delay?

The aim of this presentation is to produce a graphical summary of the airline performance data. Due to the large size of the data set, the author retrieved the recent 11 years' (1998-2008) data for analysis. All the analyses are made from four different aspects: top 50 severely delayed airports, different airline carriers, days of week and months of year. And conclusions and recommendations in terms of the aspects above are made at the end.

## Analysis



First, let us see whether the days of the week have significant differences in delay. We conducted a one-way ANOVA. The p-value of Brown and Forsythe's test for Homogeneity of delay variance is 0.9165, which is non-significant at significant level  $\alpha=0.25$ . The results of Tukey's simultaneous test at  $\alpha=0.1$  are following:

Friday	vs	Tuesday	(p=0.0378)
Friday	vs	Saturday	(p=0.0063)
Thursday	vs	Saturday	(p=0.0056)
Monday	vs	Saturday	(p=0.0925)

## Top 50 airports in Severe delay

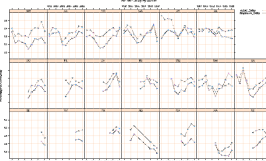
The top 50 busiest airports of US :



- Notes:
- Vertical rectangle stands for the percentage of delay. Upper limit is 100% and the lower limit is 0.
  - Horizontal rectangle stands for standard error of the percent of delay. Upper limit is the max value of a standard error.

There are three airports whose percentage of delay are over 85%.  
 Atlanta 87.06% se=2.89%  
 Philadelphia 86.57% se=2.59%  
 Chicago-ORD 86.09% se=2.59%  
 Ten airports' percentages of delay are over 80%. All of these 50 airports' percentages of delay are over 69%. The lowest is Austin, which is 69.55%.

## Airline Companies



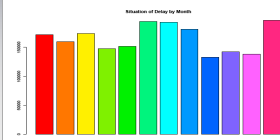
There were 20 different airline companies in 2008. Not all of them were in operation from 1998 to 2008. So we ignored the airlines which did not provide 11 years of data. From the figure above, we found that:

- Nearly all the time, the percentage of departure delay is lower than percentage of the arrival delay.
- The lowest point was usually in 2003 and the situation of delay is better in 2008 than that in 2007.
- From 2005 to 2007, Southwest airline had a big increase in departure delay, even 10% more severe than its arrival delay. And its percentage of departure delay in 2007 and 2008 is the most severe among all the airlines.

## Months of Year

One-way ANOVA was used to test the differences among months. The result are following column (significant level  $\alpha=0.1$ ).

December, June, and July versus September, November, October and April significantly (Exclude July vs April).



## Conclusion

- Southwest airline is more likely to have a departure delay.
- Friday has largest probability of delayed flights.
- December, June and July have largest percentage of delayed flights.
- Among 50 busiest airports of US, Atlanta, Philadelphia and Chicago-ORD, these three airports have over 85% delayed flights. Ten airports' percentages of delay are over 80%.
- The travelers should avoid taking Southwest airline's flights, avoid taking off on Friday or in December and avoid choosing larger airports such as Atlanta, Philadelphia and Chicago-ORD in order to reduce the probability to experience delayed flights.

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