

ECO395M Homework 1

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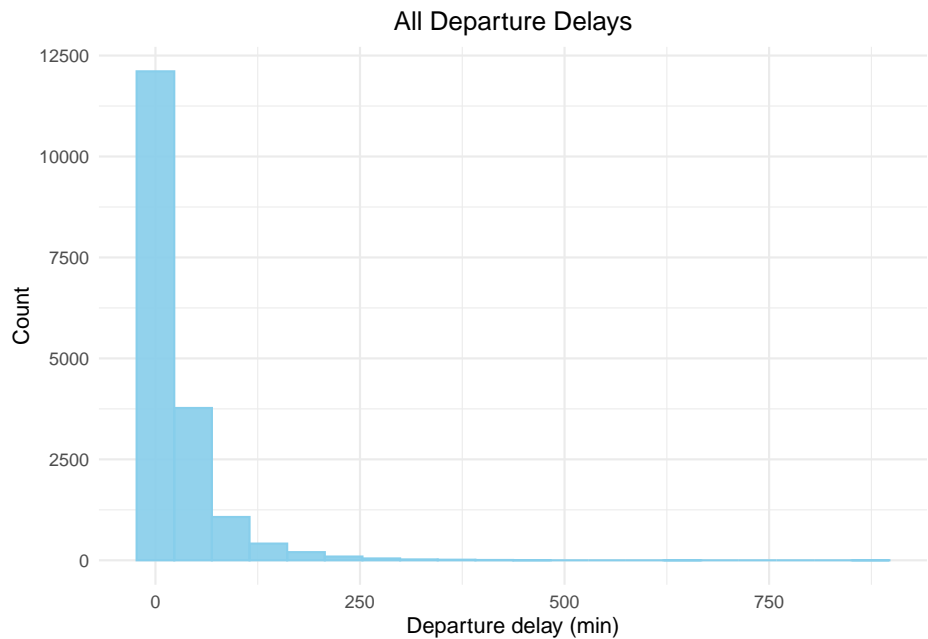
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1. Data visualization: flights at ABIA

Flight delays can often prove to be quite inconvenient. In order to enhance our overall travel experience, it is beneficial to examine the patterns of flight delays. In this question, we focused on flights that departed from the Austin-Bergstrom International Airport (AUS) in 2008, specifically those that departed later than the scheduled time.

The output below shows the summary statistics and distribution of all departure delays in minutes. The range of delays is quite large, with the minimum at 1 minute and the maximum at 875 minutes. Despite the right tail being very long, it is worth noting that most flights delayed no more than half an hour, since the third quartile is only 31.

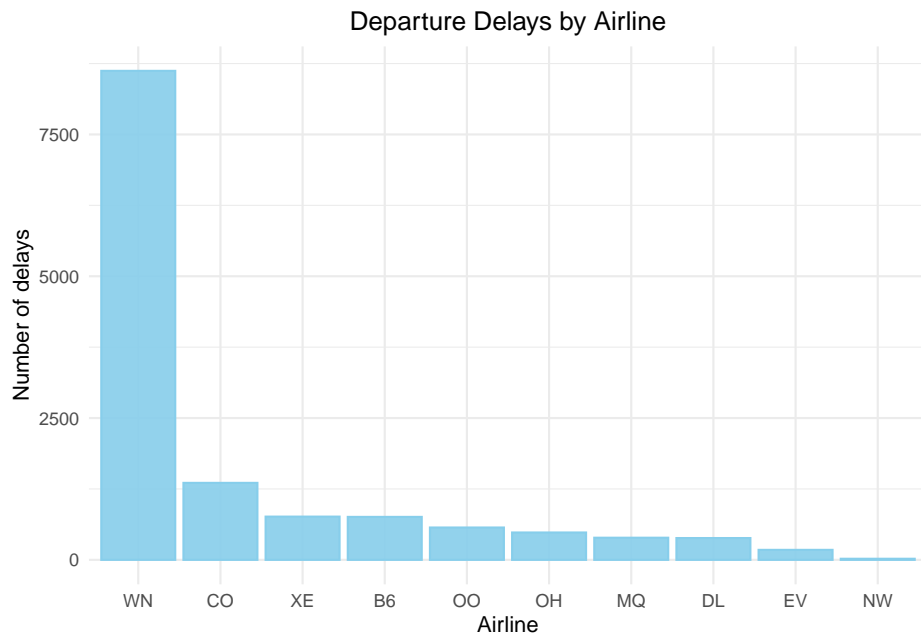
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	1.00	4.00	11.00	27.29	31.00	875.00

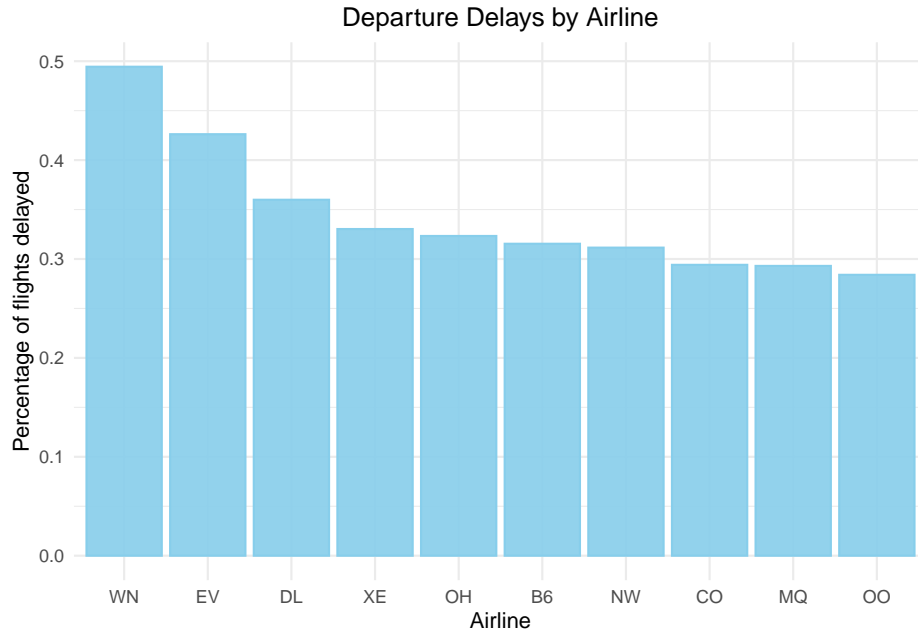


We extracted the top 10 longest delays from the dataset. All 10 flights experienced delays longer than 400 minutes, and were spread out throughout the year and hours of the day. Out of the 10 delays, 4 were operated by JetBlue (B6).

Year	Month	Day	Scheduled Departure	Airline	Flight Number	Departure Delay (min)	Origin	Destination
2008	12	27	530	9E	5800	875	AUS	ATL
2008	7	29	1440	B6	1402	665	AUS	FLL
2008	7	25	1122	OO	6202	475	AUS	DEN
2008	10	18	1205	B6	1264	442	AUS	BOS
2008	12	1	1550	B6	1416	442	AUS	MCO
2008	3	18	920	MQ	3364	437	AUS	DAL
2008	8	3	1040	AA	813	417	AUS	LAX
2008	3	18	945	AA	511	413	AUS	DFW
2008	4	24	700	DL	822	412	AUS	ATL
2008	8	11	1850	B6	1401	408	AUS	SFO

The following bar plots show the top 10 airlines with the most departure delays, in terms of number of delays and percentage of flights delayed. We noticed that there is an overlap of airlines in the two plots. Winair (WN) had significantly more delays than others, both in terms of count and percentage. Following Winair, ExpressJet (EV), Delta (DL), JetSuiteX (XE) and PSA Airlines (OH) had the highest percentage of flights delayed.





We then investigated whether delay patterns differ by hours of the day. From the density plot for all delayed flights, it seems that flights in the evenings tend to have longer delays than those in the mornings, reflected by thicker right tails.

Since Delta Airlines is a major commercial airline that had a lot of delayed flights, we wanted to know if it had the same patterns as the whole sample. The density plot shows that Delta didn't have flights departing after 6 pm, but it still experienced a lot of delays during the day. One interesting point is that their flights departing from 3 pm to 4 pm had a good number of delays over 2 hours. So it may be a good idea to choose another airlines if we want to leave Austin in the afternoon.

