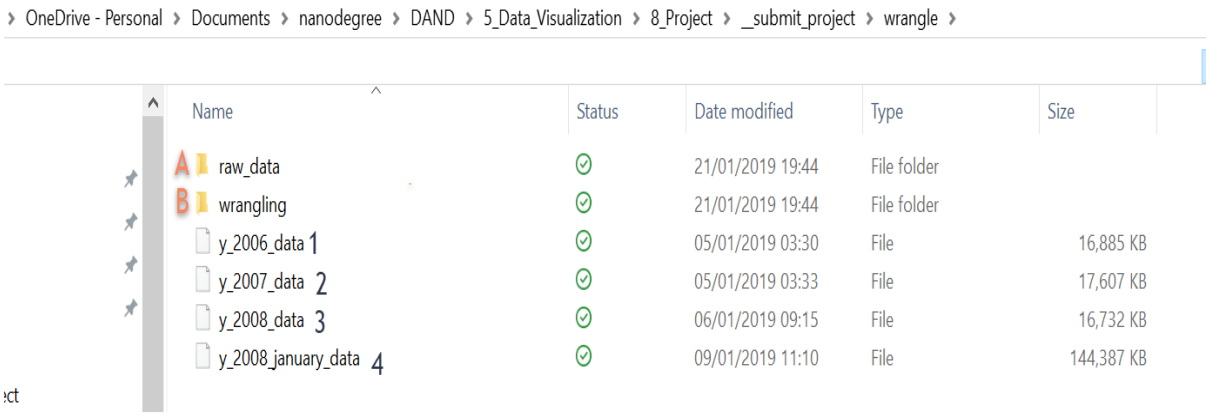
Project 5: Data Visualization. Dataset: Flights
By Andy Soelistio. January 21, 2019

Structures of my project

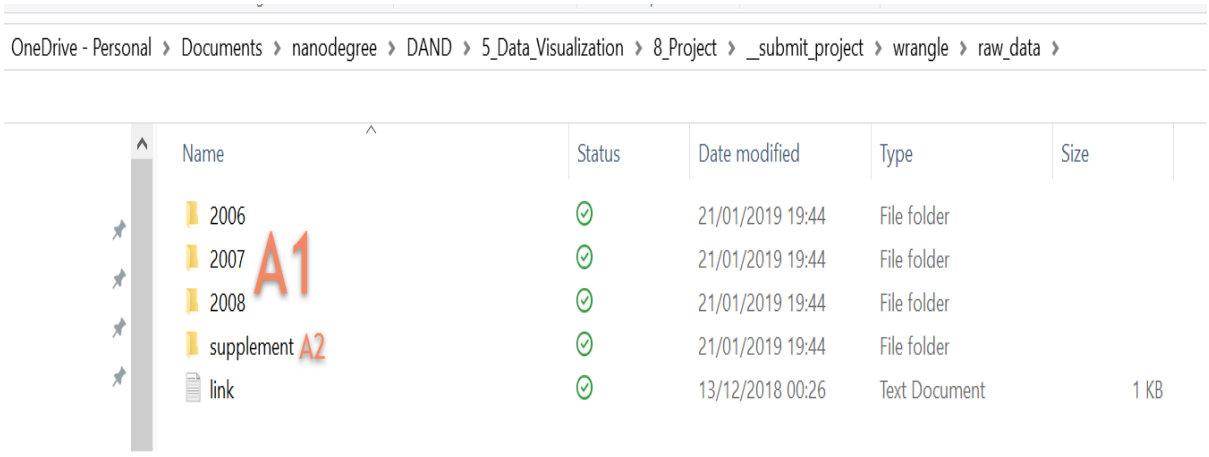


A: This is where I put my raw data. If you click this folder, you will find A1 and A2. More about this later.

B: This is where I do all my wrangling from year 2006, 2007, and 2008. More about this later.

1,2, and 3: This is where I put my sampled data after wrangling is done in folder B. Each file contains about 70,000 rows. It is about 1% of original raw data.

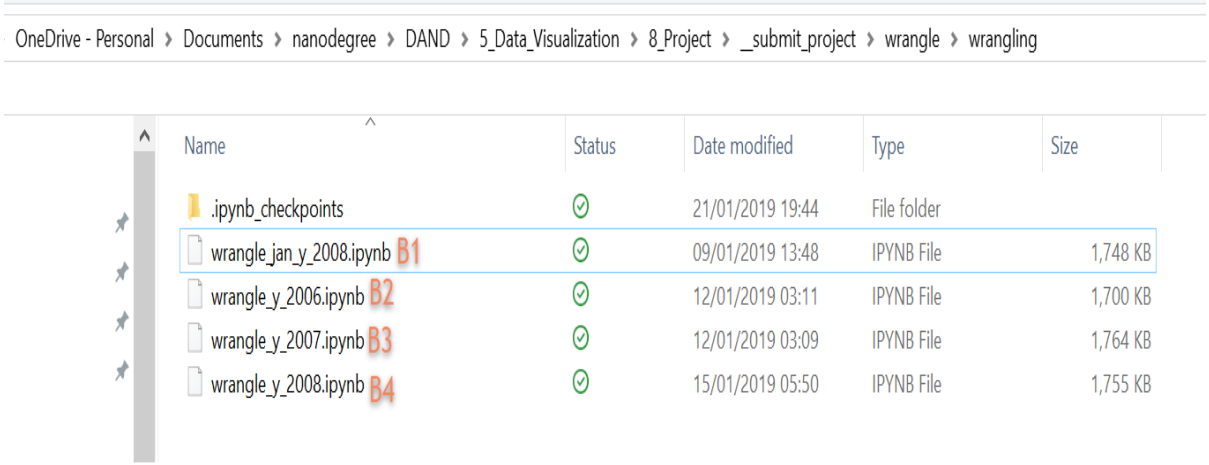
4: This file only contains only January, 2018 data. It is wrangled data.



A1: This is where I put raw data. Each folder contains about 800 Mb of data! Therefore you have to manually download it yourself and put it into these folders: 2006, 2007, and 2008. Here is the link to raw data: http://stat-computing.org/dataexpo/2009/the-data.html. Please download only 2006, 2007, and 2008.

A2: This folder contains two raw data: airports.csv, and carriers.csv. These are helper files

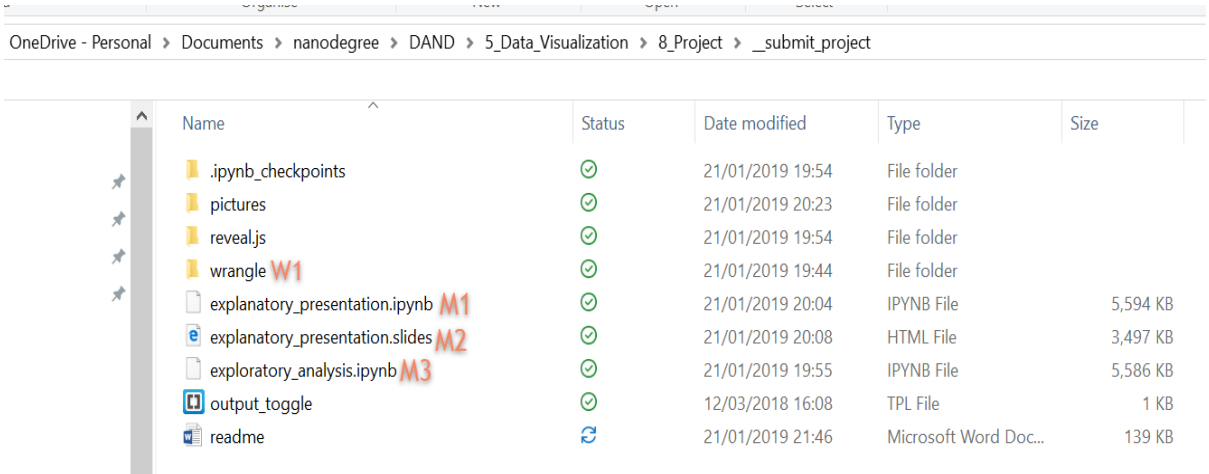
that make my data more human-intelligible. Here is the link if you to download it yourself: http://stat-computing.org/dataexpo/2009/supplemental-data.html



This folder contains files where I do most of my data-wrangling. This is not a trivial task.

B1: This is where I wrangle data. The output of this file is saved as 4.y_2008_january_data. This file contains 600,000 rows! Just January 2008 data.

B2,B3,and B4: This is where I wrangle data. The output of this file is save as 1.y_2006_data, 2.y_2007_data, 3.y_2008_data. Each file contains 70,000 rows of sampled data.



This folder is where I put my project files.

W1: This is where I put my raw data and wrangling files discussed above.

M1: This is my explanatory presentation ipynb file.

M2: Click this to view slideshow presentation.

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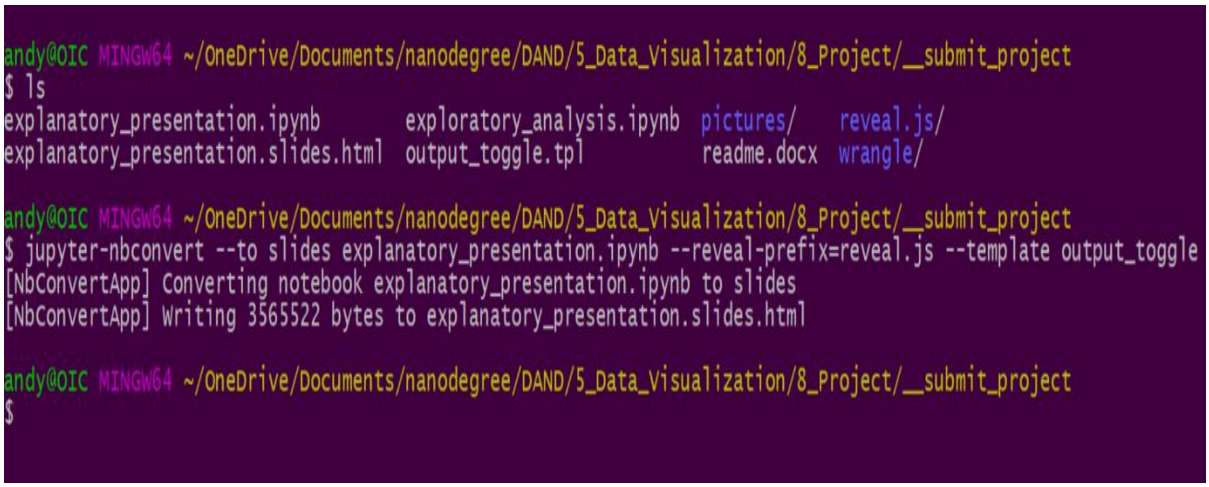
M3: This is where I do further wrangling and exploratory analysis.

Creating slideshow

In case if you need to create slideshow yourself, please type this on your command prompt or bash:



Main Findings

Since I have done extensive comment on exploratory analysis (and I'm short on time ☺), I'll just copy and paste from my jupyter notebook:

Talk about some of the relationships you observed in this part of the investigation. Were there features that strengthened each other in terms of looking at your feature(s) of interest?

- From Section 5.2, Section 5.3, and Section 5.4, we can see a general trend. I call it **cascading** delays. Shortest mean delays started in the morning or late morning and then delays get progressively longer at Late Night or Early Morning. This trend makes intuitive sense because if we had delays in the morning, then delays will be carried over in the next flight and cascaded as hours go by.

- I decided to check / drill down this hypothesis -- `that delays are cascaded`. I made 3 queries: query_1, query_2, and query_3. The query results surprised me and I have to reject the hypothesis. 300 minutes delays happened in the first or first two rows and happened in the Early Morning. Then flights generally returned to normalcy, i.e no delays as hours progressed.

- Then I explored causes of delays. I plot the causes of delays and it strengthens the **rejection** of the hypothesis -- `that delays are cascaded`. From the plot, we can see that delays are caused by LateAircraftDelay, CarrierDelay and WeahterDelay that happened longer at LateNight and EarlyMorning.

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Were there any interesting or surprising interactions between features?

- Fig. 5.7a and Fig. 5.7b show that big-sized airports have shorter mean delays. Notice that they have less red and yellow circles.

- Almost all plots in Section 5.7a and Section 5.7b show that airports located on Western coast have shorter mean delays than airports located on Eastern Coast. Also there are less airports located on the Western coast than the Eastern coast.

Explanatory Presentation

My explanatory presentation is basically from my exploratory_analysis.ipynb. I skipped the cells that I don't need. I select cells that I think is important to be slides. Hope you enjoy my presentation.

References:

Slideshow presentation:
https://www.youtube.com/watch?v=EOpcxy0RA1A&index=148&t=0s&list=WL

TimeSeries:

https://towardsdatascience.com/basic-time-series-manipulation-with-pandas-4432afee64ea

plotly:

https://medium.com/analytics-vidhya/introduction-to-interactive-geoplots-with-plotly-and-mapbox-9249889358eb

online tutorials:

nanodegree tutorials