

SEATTLE VS TOULOUSE

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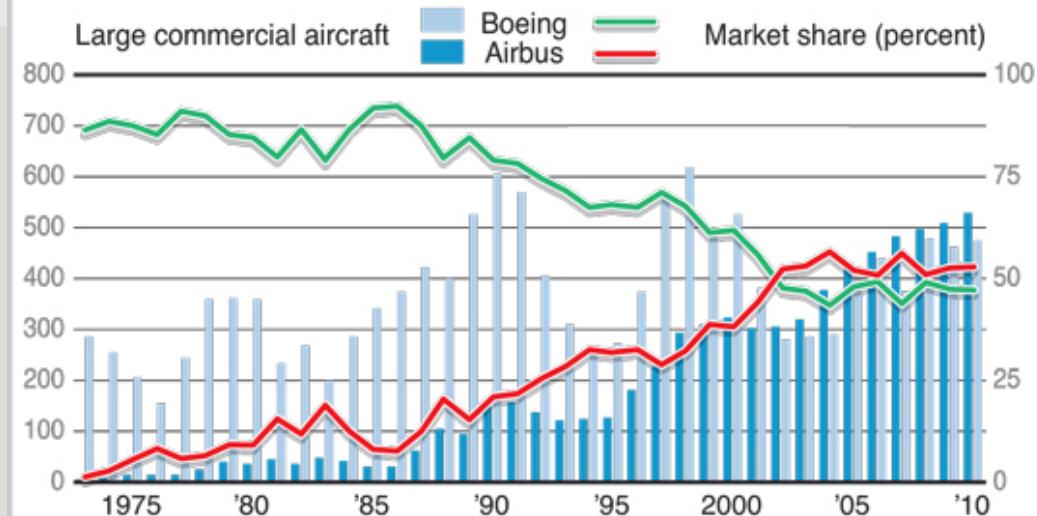
COURSERA APPLIED DATA SCIENCE CAPSTONE ASSIGNMENT

AEROSPACE INDUSTRY LEADERS...

- Airbus and Boeing are the two leaders of the commercial aircraft industry. Each one is sharing about 50% of this market.

AIRBUS AND BOEING

Deliveries and market share



Note: 2011 Airbus deliveries over 530, industry sources say. Figures due on Jan. 17
Boeing data includes McDonnell-Douglas pre-1997 merger

Source: Company data

REUTERS

...ARE FIGHTING TO BE THE ONE...

- Both competitors are fighting to be the One, designing and delivering the best aircraft regarding market acceptance. Aeronautics Industry is more than these two companies. A dense network of subcontractors has grown to leverage and support the industry.

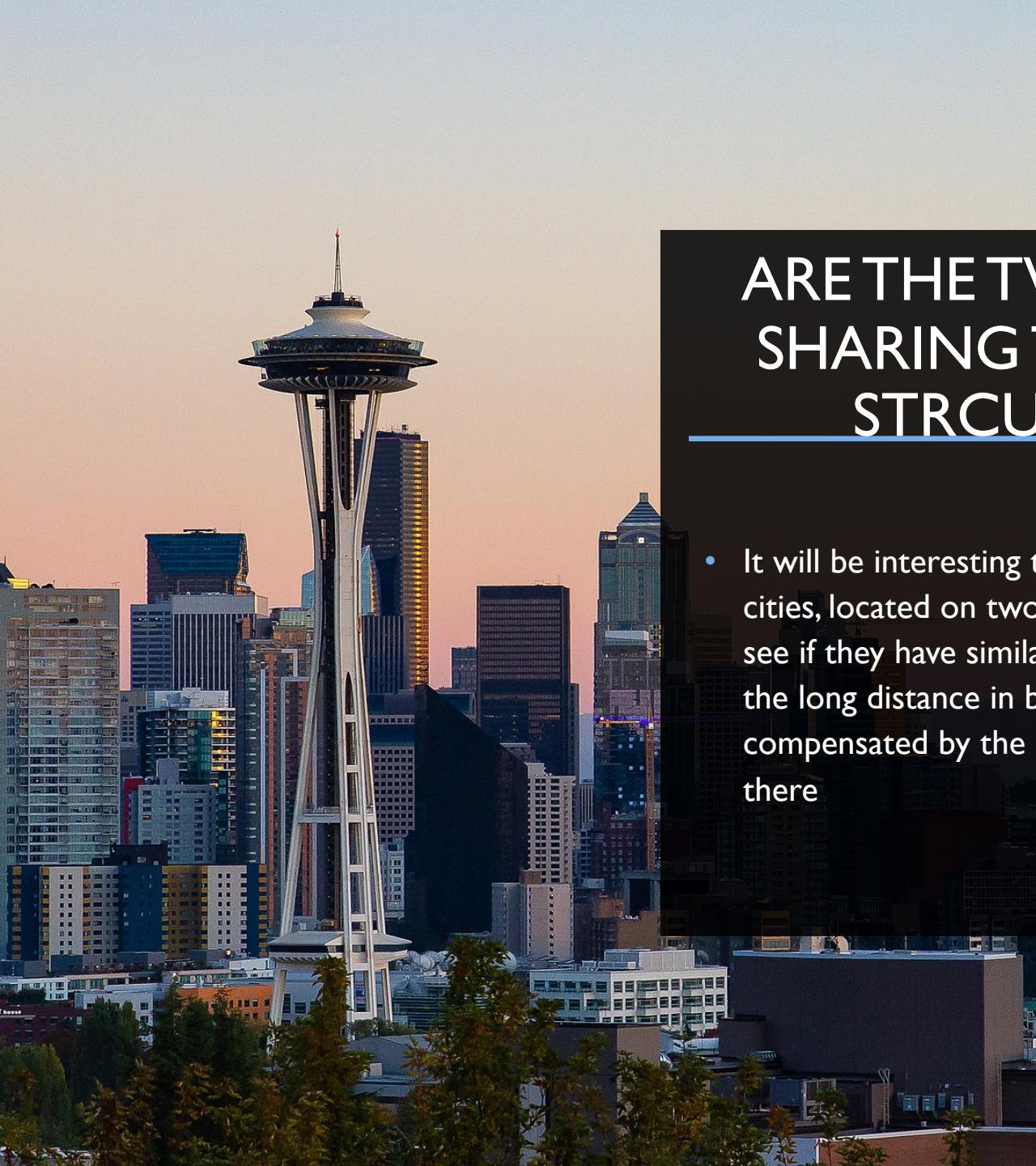




...SHAPING THEIR OWN CITIES

- Boeing biggest factory is based at Seattle (USA)
- Airbus' one in Toulouse (France)



A photograph of the Seattle skyline at sunset, featuring the iconic Space Needle tower and various skyscrapers against a warm, orange-hued sky.

ARE THE TWO CITIES SHARING THE SAME STRUCTURE?

- It will be interesting to compare the two cities, located on two distinct continents, to see if they have similar characteristics, and if the long distance in between can be compensated by the major industry that live there
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- A photograph of a grand, neoclassical building with multiple stories, ornate architectural details, and large arched windows, likely the Capitole de Toulouse.

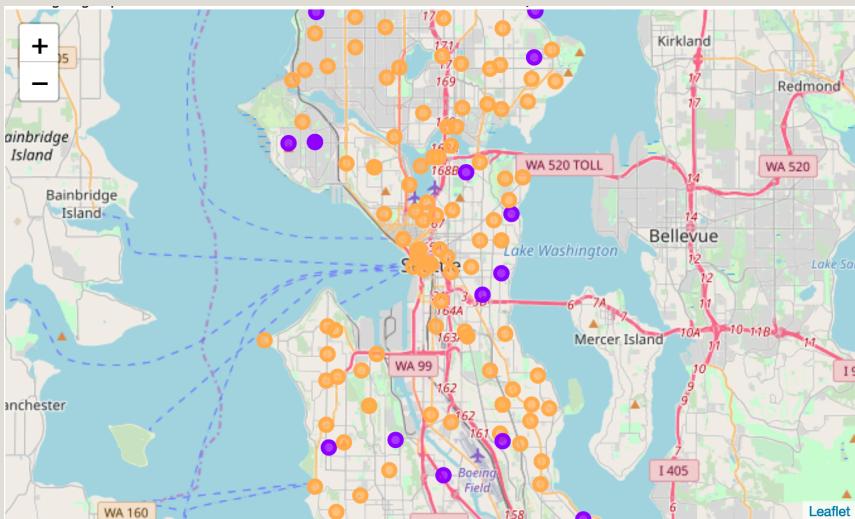
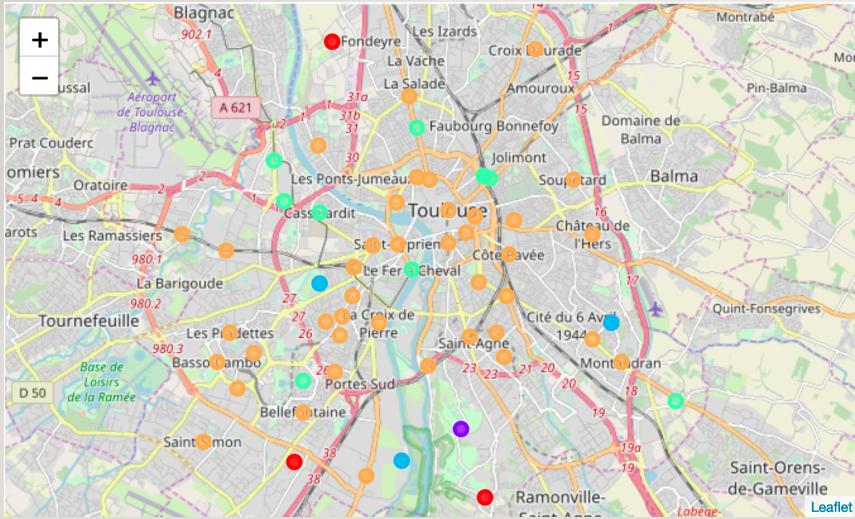


WHAT CAN BE THE BENEFITS FOR COMPETITORS?

- In a concrete way, the two competitors need an attractive city background to retain best talents. Results from this study should also be used to discuss with the respective cities governance some action plan to improve some neighborhood services offer.

DATA ACQUISITION AND CLEANING

- To consider the problem we can list the data as below:
- First, we can find detailed information on cities neighborhoods from wikipedia, for Seattle (https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Seattle) and for Toulouse (https://fr.wikipedia.org/wiki/Quartiers_de_Toulouse).
- Then we can use GeoPy (<https://geopy.readthedocs.io/en/stable/>) to localize these neighborhoods.
- The foursquare API (<https://developer.foursquare.com/>) can be used to gather venues information.
- All this information can be processed to analyze the two cities and to see if they sharing to the same structure or not.



CREATING CLUSTERS FROM NEIGHBORHOODS

- After data cleaning, there were 132 geolocalized neighborhoods in the Seattle's data, and 62 in the Toulouse's data
 - To determine whether the two cities are similar or not, neighborhoods are analyzed using k-means clustering method
 - The clustered neighborhoods can be represented in the cities' maps. Color for a given cluster is the same in the both maps

NEIGHBORS OR NOT NEIGHBORS

First result we can discuss is that on the k-means clustering part, the 5 clusters don't have similar size, whatever the city:

Second interesting result is that for both cities, Seattle and Toronto, the major part of the neighborhoods is part of cluster #5.

Then, the 4 remaining clusters seems to be specific to one city:

- Cluster 1 → Toulouse
- Cluster 2 → Seattle
- Cluster 3 → Toulouse
- Cluster 4 → Toulouse

Cluster	Number of neighborhoods
1	4
2	17
3	4
4	13
5	154

Looking at the maps, we can also see the two cities have different schemas:

- For Seattle, we can clearly see a core of cluster 5 (orange points), with around, a belt of cluster 2.
- For Toulouse, all the clusters seem to be randomly plotted.

CONCLUSION AND FUTURE DIRECTIONS

- Based on two different machine learning techniques based on neighborhood venues analysis, **we can conclude that Seattle and Toulouse have very similar neighborhoods**, because the greatest part of the neighborhoods are in the same cluster (cluster #5).
- But for a few numbers of neighborhoods, we can see specificities linked to the city (Seattle for cluster #2 and Toulouse for clusters #1, #3 and #4). Airbus and Boeing should focus on these ones to determine what is the added value of these neighborhoods. If the added value is
 - positive, they could discuss city governance to find ways to improve other neighborhoods venues,
 - negative, they could discuss city governance to find ways to improve these neighborhoods venues

