Assignment 1: Air Transportation

Date Due: February 4, 2020   Instructor: Trani
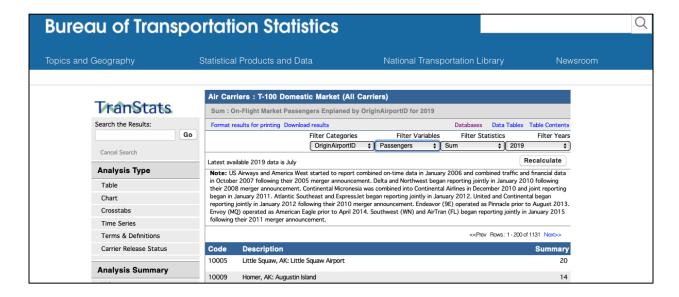
Problem 1

Familiarize yourself with the Great Circle Mapper application (http://www.gcmap.com//). Plan two trips from LaGuardia airport (LGA) to: 1) Charlotte (CLT) and 2) LAX (Los Angeles).

a) Extract the great circle distance for these flights.

b) Now use the Flightaware web application (http://flightaware.com /) and extract flight information for flights flown between

each site pair. Select two random flights for each Origin and Destination airport pair flown with Airbus A320 aircraft.

c) Compare the actual distances filed in the pilot's flight plan (these are typically stated as "Planned" in Flightaware.com)

versus the great circle distances. Comment on the detour factor observed for each of the flights. The detour factor is the

ratio of the distance flown and the great circle distance calculated by the mapper http://www.gcmap.com// .

d) Extract the cruise altitudes (or sometimes called flight levels) for the flights selected in part(b) and comment on the altitudes flown.

e) Extract the complete speed and altitude profiles for one of the flights (one for each city pair) and compare the speeds

flown by the aircraft.

f) Go to the Eurocontrol Aircraft Performance Database (https://contentzone.eurocontrol.int/aircraftperformance/default.aspx?) and obtain the typical speeds and altitude profiles associated with the Airbus A320 (the database uses A320 as the make of the aircraft for the Airbus A320).

g) Draw some conclusions from the analysis. Specifically, comment on the cruise speeds and altitudes observed.

Problem 2

You are conducting a study for an airline company.

a) Use the Aviation Database T-100 Domestic Market (all carriers - see figure below) to extract the number of passengers

boarding (enplaned) at Atlanta (ATL) and at Chicago (ORD) airports in the past 3 years. Make a plot and comment on the

results observed. The T-100 database is available at the BTS web site (www.transtats.bts.gov).
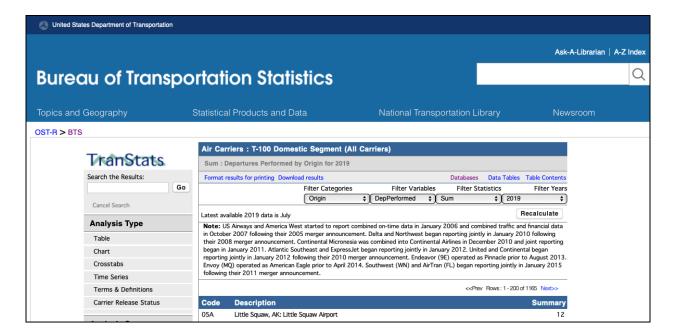
b) Use the same database to understand the impact of Covid-19 in passenger travel at the two airports in question. Since year 2020 data is incomplete, use data for April and May of 2019 and 2020 to compare the airline traffic statistics.

Problem 3

You are conducting a study of flight demand for various airports in the country.

Use the Aviation Database T-100 Domestic Segment (all carriers - see figure below) to extract the number of departures performed and seats offered from Denver International Airport (DEN) in the past 3 years. Make a plot (or a bar chart) and comment on the results observed.

Problem 4

You are conducting a study of domestic passenger fare statistics.

Estimate the average domestic fares from three airports: ORD (O'Hare), MDW (Midway), MCO (Orland), and SFB (Sanford). Perform the analysis for Quarter 1 in 2020 and Q1 in 2019. Compare the fares at the selected airports with average nationwide fares. Offer some plausible explanation about the trends observed. Note that MDW and ORD are in the same geographical area. Similarly MCO and SFB.

Problem 5 - Landing Events Database

a) Install the VT/FAA landing events database in your computer

b) Select ATL airport and extract the average landing speeds for Boeing 737-800 aircraft landing at any of the 5 runways at Atlanta.

c) Select DEN airport and extract the average landing speeds for Boeing 737-800 aircraft landing at any of the runways at Denver.

d) Find the average runway occupancy times at each airport for the runway and aircraft selected. Compare the results and explain.