Assignment 1: Air Transportation

Date Due: January 23, 2018   Instructor: Trani

Problem 1

Familiarize yourself with the Great Circle Mapper application (http://www.gcmap.com//). Plan two trips from Providence International airport (PVD) as follows: 1) PVD to EDI (Edinburgh) and 2) PVD to BWI (Baltimore).

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 those cities. Select two random flights for each Origin and Destination airport pair.

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 flight levels for the flights selected in part(b) and comment on the altitudes flown. Is there a trend?

e) Extract the complete speed and altitude profiles for two of the flights (one for each city pair) and compare the speeds flown for the three distinct stage length segments. Do you see a trend?

Problem 2

You are conducting an airline passenger an airline company.

a) Use the Aviation Database T-100 Domestic Market (all carriers - see figure below) to extract the number of passengers enplaned at Atlanta (ATL) and at San Francisco (SFO) 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 extract the top three airports in the nation with the highest passengers originating at the airport in 2016.
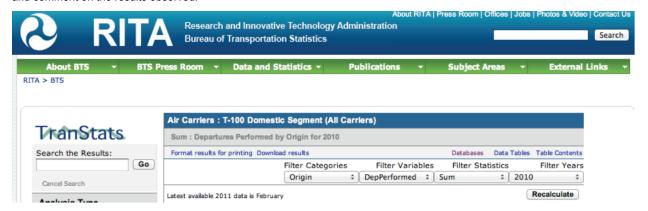
Problem

Problem 3

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

a) Use the Aviation Database T-100 Domestic Segment (all carriers - see figure below) to extract the number of departures performed and seats offered from Los Angeles International (LAX) 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 statistics.

a) Use the RITA (BTS) database to extract the U.S. domestic passenger enplanements from 2007 to 2016. Make a plot and comment on the results observed.

b) Estimate the average domestic fares from three airports in the Washington area: IAD, DCA and BWI. Compare the fares at these airports with average nationwide fares. Offer some plausible explanation about the trends observed.

c) Estimate the market share of flights by American Airlines for the following two airports: a) CLT and b) DFW. Plot the market share over the past 3 years and comment on the trends observed.

Problem 5 - Short answers - Consult the Web

a) Explain the reasons behind the growth in air traffic from airports like Chicago Midway (MDW) in the US in the past 35 years.

b) Research some of the reasons for the success of the Douglas DC-3 as the first commercially viable airliner

c) Research (on the web) about the introduction of the first commercial jet aircraft. Mention three important milestones achieved by commercial jets between 1950 and 1970.