Assignment 1

Date Due: August 29 2011   Instructor: Trani

Problem 1

Familiarize yourself with the Great Circle Mapper application (http://www.gcmap.com//). Plan three trips from JFK International airports as follows: 1) JFK to LAX, 2) JFK to ORD and 3) JFK to BOS.

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 3 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 three 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?

f) Compare the flight profiles extracted with the Eurocontrol Aircraft Performance database (http://elearning.ians.lu/aircraftperformance/).

Problem 2

You are conducting an airline passenger and freight study for your company.

a) Use the Aviation Database T-100 Domestic Market (all carriers - see figure below) to extract the number of passengers enplaned at Atlanta Hartsfield (ATL) and at Kennedy (JFK) 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 freight originating at the airport in the year 2011.

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 Kennedy International Airport (JFK) in the past 3 years. Make a plot (or a bar chart) and comment on the results observed.

b) Estimate the average seats per departure at JFK using the results obtained before. Comment on the average seats offered per departure.

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 1996 to 2011. Make a plot and comment on the results observed.

b) Estimate the average domestic fares from three airports in New York: LGA, JFK and EWR. 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) LAX and b) DFW. Plot the market share over the past 5 years and comment on the trends observed.

Problem 5

You are conducting a study of airline on-time performance using the BTS web site.

a) Use the RITA (BTS) database to extract the on-time performance statistics (reported as percent of flights late) between JFK and ATL airports for the year 2010 (from January 1 to December 31, 2010). Find the average departure delays for these flights.

b) Repeat for flights between LGA and DCA. Comment on the observed delays and taxi-in and taxi-out times from these airports.