

Assignment 1: Air Transportation

Date Due: August 31, 2015

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Problem 1

Familiarize yourself with the Great Circle Mapper application (<http://www.gcmap.com/>). Plan two trips from La Guardia airport as follows: 1) LAX to DCA and 2) LGA to DEN.

- Extract the great circle distance for these flights.
- Now use the Flightaware web application (<http://flightaware.com/>) and extract flight information for two flights flown between those cities in the past 10 days.
- 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/>.
- Extract the cruise flight levels (i.e., altitude) for the flights selected in part(b) and comment on the altitudes flown. Is there a trend?
- 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.

- Use the Aviation Database T-100 Domestic Market (all carriers - see figure below) to extract the number of **passengers enplaned** at Chicago O'Hare International (ORD) and Atlanta (ATL) 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).
- Use the same database to extract the top three airports in the nation with the highest originating at the airport in the year 2014 (or 2013 if 2014 is not available).

Problem

The screenshot shows the RITA website interface. At the top, there is a navigation bar with links for 'About RITA', 'Press Room', 'Offices', 'Jobs', 'Photos & Video', and 'Contact Us'. Below this is the RITA logo and the text 'Research and Innovative Technology Administration Bureau of Transportation Statistics'. A search bar is located on the right side of the header. The main content area features a green navigation bar with dropdown menus for 'About BTS', 'BTS Press Room', 'Data and Statistics', 'Publications', 'Subject Areas', and 'External Links'. Below the navigation bar, the page title is 'RITA > BTS'. The main content area displays the 'TranStats' search interface. The search results are for 'Air Carriers : T-100 Domestic Market (All Carriers)'. The search criteria are set to 'Sum : On-Flight Market Passengers Enplaned by Origin for 2010'. The interface includes a search bar, a 'Go' button, and a 'Recalculate' button. The search criteria are set to 'Origin' for 'Passengers' in 'Sum' for the year '2010'.

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

The screenshot shows the RITA Bureau of Transportation Statistics website. The header includes the RITA logo and navigation links. The main content area displays the TranStats interface for the T-100 Domestic Segment. The interface includes a search bar, filter options for categories, variables, statistics, and years, and a recalculate button.

Problem 4

You are conducting a study of domestic passenger statistics.

- a) Estimate the average domestic fares for two airports in the Chicago area: ORD and MDW. Compare the fares at these airports with average nationwide fares. Offer some plausible explanation about the trends observed.
- b) Estimate the market share of flights by American Airlines for the following two airports: a) CLT and b) ORD. Plot the market share over the past 5 years and comment on the trends observed.

Problem 5 - Short answers - Consult the Web

- a) Explain the reasons behind the relatively flat number of commercial flight operations in the US in the past decade.
- b) Research some of the reasons for the success of the Boeing 777.
- c) Explain why countries like China and India have fast growing air traffic.
- d) Research (on the web) about the introduction of the first large capacity aircraft - the Boeing 747. Mention three important milestones achieved by such aircraft.