

Name _____

GBA 464 – Quiz 3

Questions 1 – 6:

Data files on Blackboard: flightData.csv, airportData.csv and carrierData.csv. The data for the three data files is described in the tables below. The data contains airline on-time information for all flights departing NYC in 2013.

flightData.csv	Field Description
Year	Flight year
Month	Flight month
Day	Flight day of month
Dep_time	Actual time of flight departure
Sched_dep_time	Scheduled time of flight departure
Dep_delay	Time in minutes between scheduled and actual departure
Arr_time	Actual time of flight arrival
Sched_arr_time	Scheduled time of flight arrival
Arr_delay	Time in minutes between scheduled and actual arrival
Carrier	Two character airline code
Flight	Flight Number
Tailnum	Tail number of plane
Origin	Three character airport code of flight origin
Dest	Three character airport code of flight destination
Air_time	Time in minutes flight spent in the air
Distance	Distance in miles flight traveled
Time_hour	Scheduled date and hour of flight as POSIXct date
airportData.csv	Field Description
Faa	Three character airport code
Name	Name of airport
State	State in which airport is located
Lat	Latitude of airport location
Lon	Longitude of airport location
Alt	Altitude in feet of airport
Tz	Timezone offset from GMT
Dst	Daylight savings time: A = Standard US DST, N = No DST, U = unknown
Tzon	Time zone of airport
carrierData.csv	Field Description
Carrier_code	Two character airline code
Airline	Name of airline



1. What is the month of the year with the longest mean departure delay?
What is the month of the year with the shortest mean departure delay?
What is the month of the year with the longest mean arrival delay?
What is the month of the year with the shortest mean arrival delay?



Merge the flightData datafile with the carrierData datafile.

2. Find each airline's mean departure delay by month.
In what month did Alaska Airlines have its longest monthly mean departure delay?
In what month did American Airlines have its longest monthly mean departure delay?
In what month did Hawaiian Airlines have its longest monthly mean departure delay?
In what month did Frontier Airlines have its longest monthly mean departure delay?



3. Complete the table below showing how many airlines had their longest monthly mean departure delay in each month.

Month	Number of airlines with longest monthly mean departure delay in month
January	2
February	
March	
April	
May	
June	
July	
August	0
September	
October	
November	
December	



A kpi for flight performance is **Gain**, defined as the amount of time a flight made up (or lost) in the air.

For example: a flight scheduled to depart at 6:08pm that actually departed at 6:32pm was scheduled to arrive at 7:28pm and actually arrived at 7:40pm. This flight “gained” 12 minutes in the air. In other words, its arrival time was 12 minutes earlier than would have been predicted by its actual departure time. A flight that left on time and arrived late would have a negative gain.

4. Which airlines have a negative average Gain for the entire time period of the data?



Which airlines have an average Gain for the entire time period of the data between 0 and 3 minutes?

Which airlines have an average Gain for the entire time period of the data between 3 and 5 minutes?

Which airlines have an average Gain for the entire time period of the data greater than 10 minutes?



Gain/hour is also measured, defined as the flight’s Gain per hour of air time.

Let GainRank be the ordinal ranking for the carriers by Gain (1 = carrier with highest value for Gain) and GainPerHourRank be the ordinal ranking for the carriers by Gain/Hour (1 = carrier with the highest value for Gain/Hour).



5. What is the GainRank and GainPerHourRank for Hawaiian Airlines?

What is the GainRank and GainPerHourRank for Virgin America?

What is the GainRank and GainPerHourRank for Alaska Airlines?

What is the GainRank and GainPerHourRank for ExpressJet?



Merge the flightData datafile on its 'dest' column with the airportData datafile.

6. Write a function that accepts two arguments: state and measure. State refers to the state in which the destination airport for each flight is located. Measure can be one of 5 functions: sum, mean, sd, median, range. The function should return the value of departure delay aggregated by the function selected for the state selected.

Examples:

Mean departure delay for all flights to California

```
> delay_state("California", mean)
[1] 11.00092
```

Range of departure delays for all flights to Florida

```
> delay_state("Florida", range)
[1] -30 960
```