Week 2 Assignment

1. Which destination in the flight database is the furthest distance away?

   Query 1:-
   ```
   /*
           Farthest travelling from any origin
   */
   select distinct origin, dest, distance
   from flights
   where distance = (
   select max(distance)
   from flights
   )
   ;
   ```
   Ans:-
   JFK TO HNL and EWR to HNL are the flights covering longest distance of 4,963 miles

   Query2 :-
   ```
   /*
           Farthest travelling per Origin
   */
   select distinct flights.origin, flights.dest, f.farthest
   from flights
           join
           (select origin, max(distance) as farthest
            from flights
            group by origin
            ) as f on f.origin = flights.origin and f.farthest = flights.distance
   order by flights.origin
   ;
   ```

   Result:- By origin

Origin	Dest	Distance
EWR	HNL	4963
JFK	HNL	4983
LGA	DEN	1620

2. What are the different numbers of engines in the planes table? For each number of engines, which aircraft have the most number of seats?

Query:-
```
/*
        Aircrats with most seats by number of engines
*/
select distinct p.manufacturer, p.model as aircraft, p.engines, p.seats
from planes as p
        join
        (
        select p.engines, max(seats) as Mostseats
        from planes as p
        group by p.engines
        order by p.engines
        ) as p1 on p1.engines = p.engines and p1.MostSeats = p.Seats
order by p.engines
;
```

Result:-

Manufacturer	Aircraft	Engines	Seats
DEHAVILLAND	OTTER DHC-3	1	16
BOEING	777-200	2	400
BOEING	777-222	2	400
BOEING	777-224	2	400
BOEING	777-232	2	400
AIRBUS	A330-223	3	379
BOEING	747-451	4	450

3. What weather conditions are associated with New York City departure delays?

Query:-
```
/*
        Get the weather condition with newyork city departure delays. Weather data exists only
for 2013
*/
select distinct f.year, f.month, f.day, f.dep_time/100 as dephour, f.dep_time, dep_delay,
w.temp, w.dewp, w.humid, w.wind_dir, w.wind_speed, w.wind_gust, w.precip, w.pressure,
w.visib
from flights as f
         join weather as w on w.origin = f.origin and w.year = f.year and w.month = f.month and
w.day = f.day and w.hour = f.dep_time/100
where f.origin in ('JFK', 'LGA')
and dep_delay > 0   -- assuming < 0 = early departure
order by f.year, f.month, f.day, dephour
limit 1000;
```
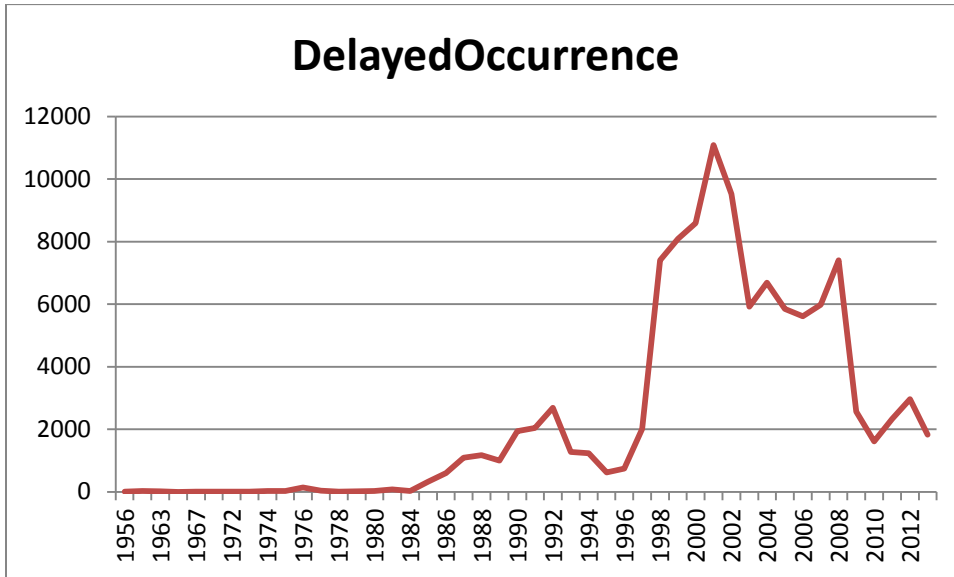
Result:-

Year	Month	Day	DepHour	DepTime	DepDelay	Temp	dewp	humid	winddir	wi
2013	2	20	19	1901	6	32	8.06	36.03	280	
2013	2	20	19	1903	48	32	8.06	36.03	280	
2013	2	20	19	1911	11	32	8.06	36.03	280	
2013	2	20	19	1930	85	32	8.06	36.03	280	
2013	2	20	19	1935	10	32	8.06	36.03	280	
2013	2	20	19	1938	33	32	8.06	36.03	280	
2013	2	20	19	1946	76	32	8.06	36.03	280	
2013	2	20	19	1956	11	32	8.06	36.03	280	
2013	7	2	11	1101	6	71.6	69.8	94.06	180	
2013	7	2	11	1132	7	71.6	69.8	94.06	180	
2013	7	2	11	1132	93	71.6	69.8	94.06	180	
2013	7	2	11	1141	76	71.6	69.8	94.06	180	
2013	7	2	13	1320	5	71.6	69.8	94.06	190	
2013	7	2	13	1343	168	71.6	69.8	94.06	190	
2013	7	2	13	1346	8	71.6	69.8	94.06	190	
2013	7	31	6	633	3	71.06	55.04	56.93	320	
2013	7	31	6	644	24	71.06	55.04	56.93	320	
2013	7	31	6	647	7	71.06	55.04	56.93	320	
2013	7	31	6	649	44	71.06	55.04	56.93	320	
2013	7	31	6	656	1	71.06	55.04	56.93	320	
2013	8	22	22	2222	52	75.92	66.92	73.68	210	
2013	8	22	22	2222	82	75.92	66.92	73.68	210	
2013	8	22	22	2225	115	75.92	66.92	73.68	210	
2013	8	22	22	2233	177	75.92	66.92	73.68	210	
2013	8	22	22	2259	179	75.92	66.92	73.68	210	
2013	9	2	20	2003	2	75.2	73.4	94.14	200	
2013	9	2	20	2003	33	75.2	73.4	94.14	200	
2013	9	2	20	2005	65	75.2	73.4	94.14	200	
2013	9	2	20	2006	26	75.2	73.4	94.14	200	
2013	9	2	20	2006	66	75.2	73.4	94.14	200	
2013	9	2	20	2014	89	75.2	73.4	94.14	200	
2013	9	2	20	2016	41	75.2	73.4	94.14	200	
2013	9	2	20	2016	66	75.2	73.4	94.14	200	
2013	9	2	20	2024	169	75.2	73.4	94.14	200	
2013	9	2	20	2039	39	75.2	73.4	94.14	200	
2013	9	2	20	2043	103	75.2	73.4	94.14	200	
2013	9	2	20	2045	85	75.2	73.4	94.14	200	
2013	9	2	20	2054	98	75.2	73.4	94.14	200	
2013	10	23	10	1021	6	48.92	39.02	68.51	60	

2013	10	23	10	1059	4	48.92	39.02	68.51	60	
2013	12	17	5	543	3	26.96	10.94	50.34	40	

4. Are older planes more likely to be delayed?

Ans:- No, delays are not caused by the age of the plane based on the chart below. In fact, newly manufactured flights display most delays.

Query:-
```
/*
 Delayed flights
*/
select p.year as ManufacturedYear, count(1) as delayedflights
from flights as f
        join planes as p on p.tailnum = f.tailnum
where f.dep_delay > 0
and p.year is not null
group by p.year
order by p.year
```

5. What are the top 10 airlines who had best ontime flight departure with respect to their total flights in 2013?

Query:-

-- Top 10 airlines who had best ontime flight departure with respect to their total flights

select a.name, count(1) as flightcount, count(case when dep_delay = 0 then 1 else null end) as flightwithoutdelay,
    cast(count(case when dep_delay = 0 then 1 else null end) /cast(count(1) as numeric(10,2)) as numeric(10,3)) as OnTimeFlightRatio
from flights as f
    join airlines as a on a.carrier = f.carrier
where f.year = 2013
group by a.carrier
order by OnTimeFlightRatio desc
limit 10;

Result:-

Airline	TotalFlights	OnTimeFlightDep	OnTimeToTotalFlight
Southwest Airlines Co.	12275	987	0.08
Virgin America	5162	411	0.08
Frontier Airlines Inc.	685	44	0.064
Delta Air Lines Inc.	48110	2866	0.06
United Air Lines Inc.	58665	3397	0.058
JetBlue Airways	54635	2772	0.051
Envoy Air	26397	1307	0.05
American Airlines Inc.	32729	1607	0.049
Hawaiian Airlines Inc.	342	14	0.041
AirTran Airways Corporation	3260	132	0.04