Solution for Assignment 10 (CEE 3804)

Problem 1:

Tasks 1, 2, 3, and 4:

```
%%%%%%%%%%%%%%Assignment 10 Problem 1%%%%%%%%%%%%%%%%
%%%Task 1
%clear the workspace and close all the figures
close all
clear
clc

%Load United States map
load usamap

%Load flight tracks data
load flightTracks

%Make 3- dimentional plot of the U.S map
figure
plot3(uslon,uslat,elevation,'-b','linewidth',1.5)
title('U.S. Map','FontSize', 20)
xlabel('Longitude (degrees)','FontSize', 20)
ylabel('Latitude (degrees)','FontSize', 20)
zlabel('Elevation (m)','FontSize', 20)
grid

hold on

number_flights = length(flight);

%Make 3- dimentional plot of the flights
for i=1: number_flights

    plot3(flight(i).track.longitude_deg,flight(i).track.latitude_deg,flight(i).track.altitude_m,'-')

end
```

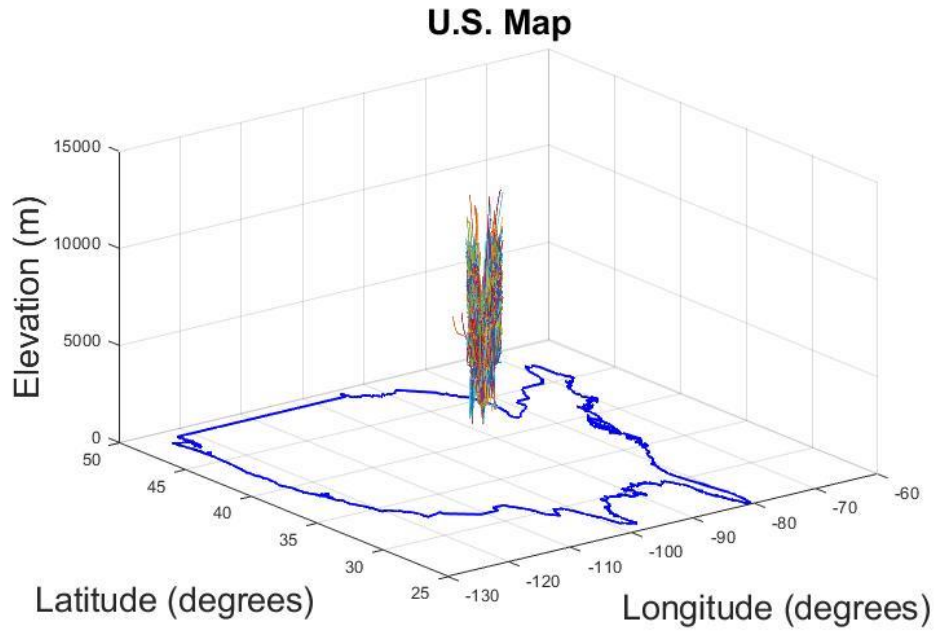
```

%Make 2- dimentional plot of the U.S map
figure
plot(uslon,uslat,'-b','linewidth',1.5)
title('U.S. Map','FontSize', 20)
xlabel('Longitude(degrees)','FontSize', 20)
ylabel('Latitude(degrees)','FontSize', 20)
grid

hold on

%Make 2- dimentional plot of the flights
for i=1: number_flights
      %plot the flights in different colors
    plot(flight(i).track.longitude_deg,flight(i).track.latitude_deg,'-')

end

%%%Task 2
%Make 2- dimentional plot of the U.S map
figure
plot(uslon,uslat,'-k','linewidth',1.5)
title('Departure Flights vs Arrival Flights','FontSize', 20)
xlabel('Longitude(degrees)','FontSize', 20)
ylabel('Latitude(degrees)','FontSize', 20)
grid

hold on

%Make 2- dimentional plot of the flights so that arrivals are depicted in red and departures in blue.
for i=1:number_flights
    %logical comparison
    if flight(i).arrival_departure == 'D'
        p1 = plot(flight(i).track.longitude_deg,flight(i).track.latitude_deg,'-b');

    else %if logical comparioson is wrong.
        p2 = plot(flight(i).track.longitude_deg,flight(i).track.latitude_deg,'-r');

    end
end
```

```
76 -    hold off
77      %Make the legend
78 -    legend([p1 p2],{'Departure','Arrival'})
79
80
81      %%%Task 3
82      %Make 2- dimentional plot of the U.S map
83 -    figure
84 -    plot(uslon,uslat,'-k','linewidth',1.5)
85 -    title('Boeing 737-800 Departure Flights vs Boeing 737-800 Arrival Flights','FontSize', 20)
86 -    xlabel('Longitude(degrees)','FontSize', 20)
87 -    ylabel('Latitude(degrees)','FontSize', 20)
88 -    grid
89
90 -    hold on
91
92      %Make 2- dimentional plot of the flights operated by Boeing 737-800 so that arrivals are depicted in red and departures in
93 -    for i=1:number_flights
94
95 -        if ismember(flight(i).aircraftType,'B738')
96 -            if flight(i).arrival_departure == 'D'
97
98 -                p1 = plot(flight(i).track.longitude_deg,flight(i).track.latitude_deg,'-b');
99
100 -           else
101
102 -              p2 = plot(flight(i).track.longitude_deg,flight(i).track.latitude_deg,'-r');
103 -           end
104 -       end
105 -   end
106 -   hold off
107
108     %Make the legend
109 -   legend([p1 p2],{'Departure','Arrival'})
110
```

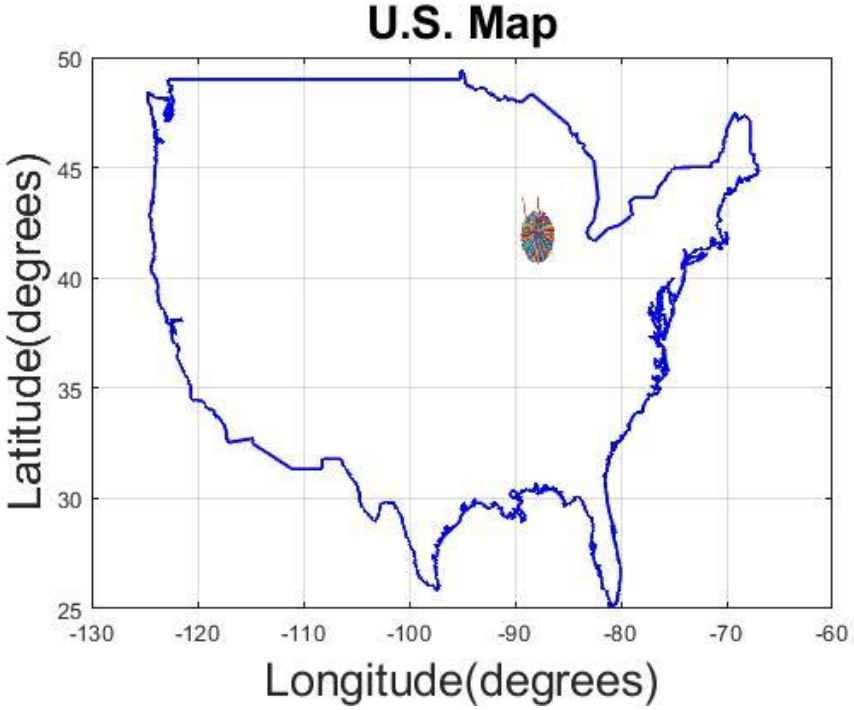
```
% Detect number of flights

noFlights = length(flight);
count = 0;
count2 = 0;

for i=1:noFlights

    % Define two flag variables

    departureFlag = strcmp(flight(i).arrival_departure,'D');
    runway22LFlag = strcmp(flight(i).runwayName,'22L');

    runway22L_departureFlag = departureFlag+runway22LFlag;

    % Find departures on runway 22L

    if runway22L_departureFlag == 2  % both conditions are met
       count = count + 1;
    end

    % Find arrivals on runway 28C

    arrivalFlag = strcmp(flight(i).arrival_departure,'A');
    runway28CFlag = strcmp(flight(i).runwayName,'28C');

    runway28C_arrivalFlag = arrivalFlag+runway28CFlag;

    if runway28C_arrivalFlag == 2  % both conditions are met
       count2 = count2 + 1;
    end

end
```

There are 228 departures on Runway 22L
There are 425 arrivals on Runway 28C

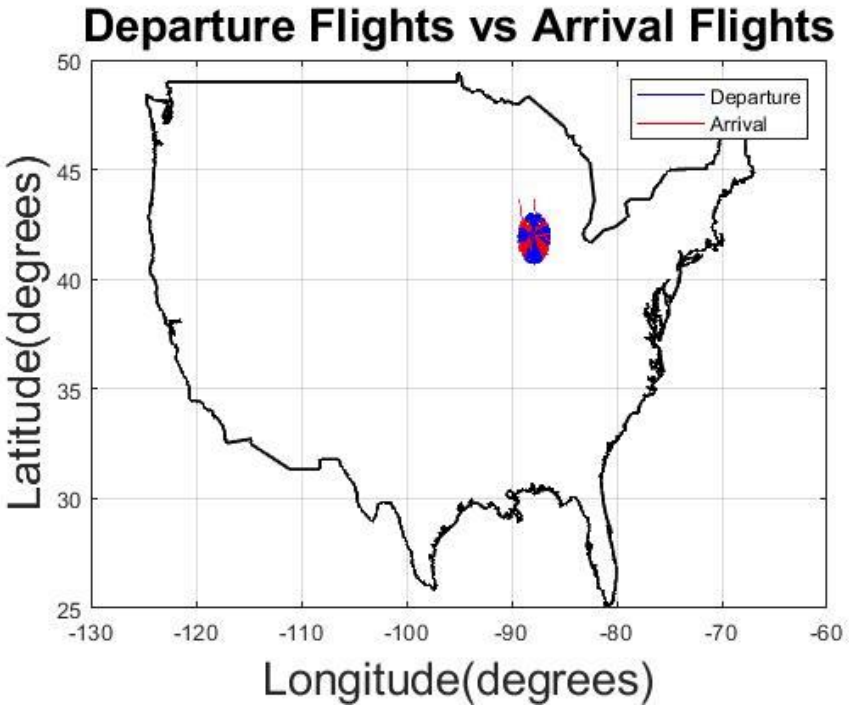
Task 1:


U.S. Map
Elevation (m)
15000
10000
5000
0
50
45
40
35
30
25
Latitude (degrees)
-130
-120
-110
-100
-90
-80
-70
-60
Longitude (degrees)

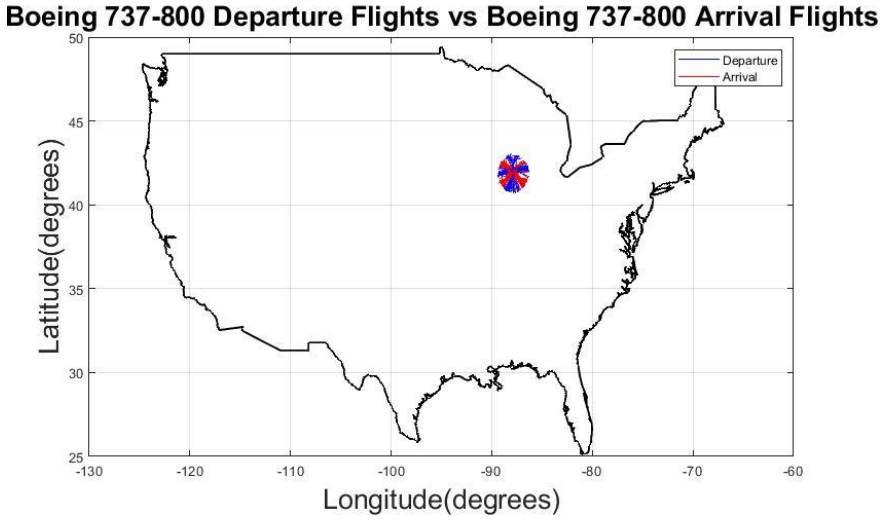
Task 2:


U.S. Map
Latitude(degrees)
50
45
40
35
30
25
-130
-120
-110
-100
-90
-80
-70
-60
Longitude(degrees)

Task 3:

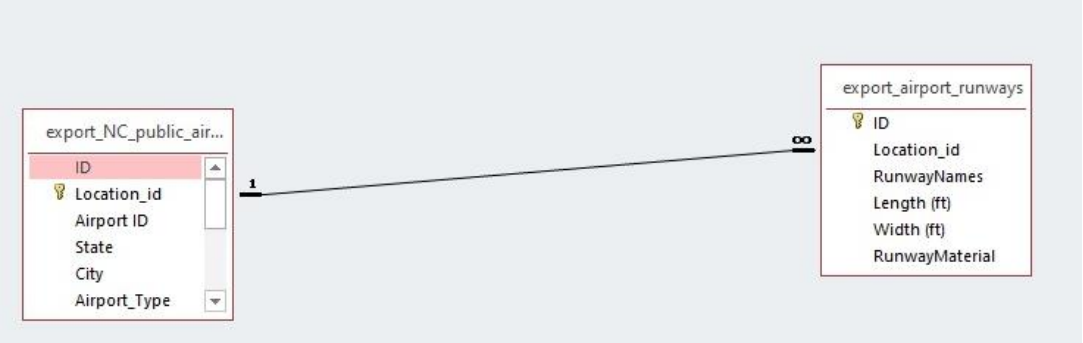

Departure Flights vs Arrival Flights
Departure
Arrival
Latitude(degrees)
Longitude(degrees)
50
45
40
35
30
25
-130
-120
-110
-100
-90
-80
-70
-60

Task 4:

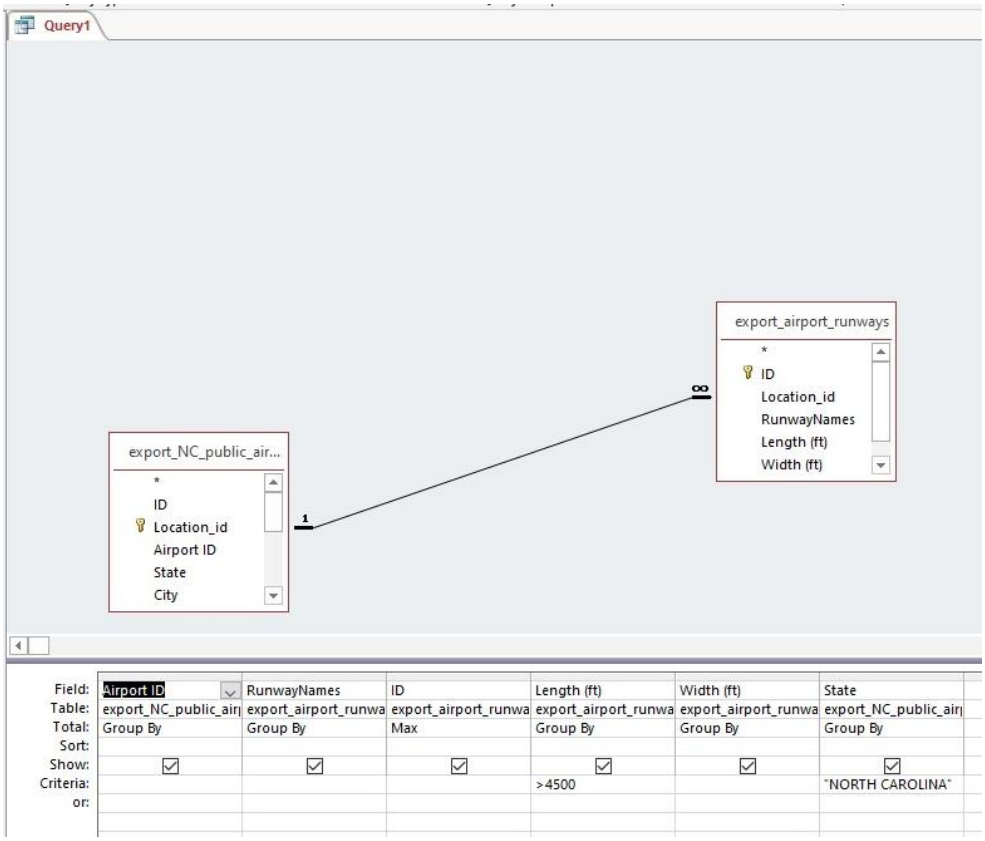

Boeing 737-800 Departure Flights vs Boeing 737-800 Arrival Flights
Departure
Arrival
Latitude(degrees)
Longitude(degrees)
50
45
40
35
30
25
-130
-120
-110
-100
-90
-80
-70
-60

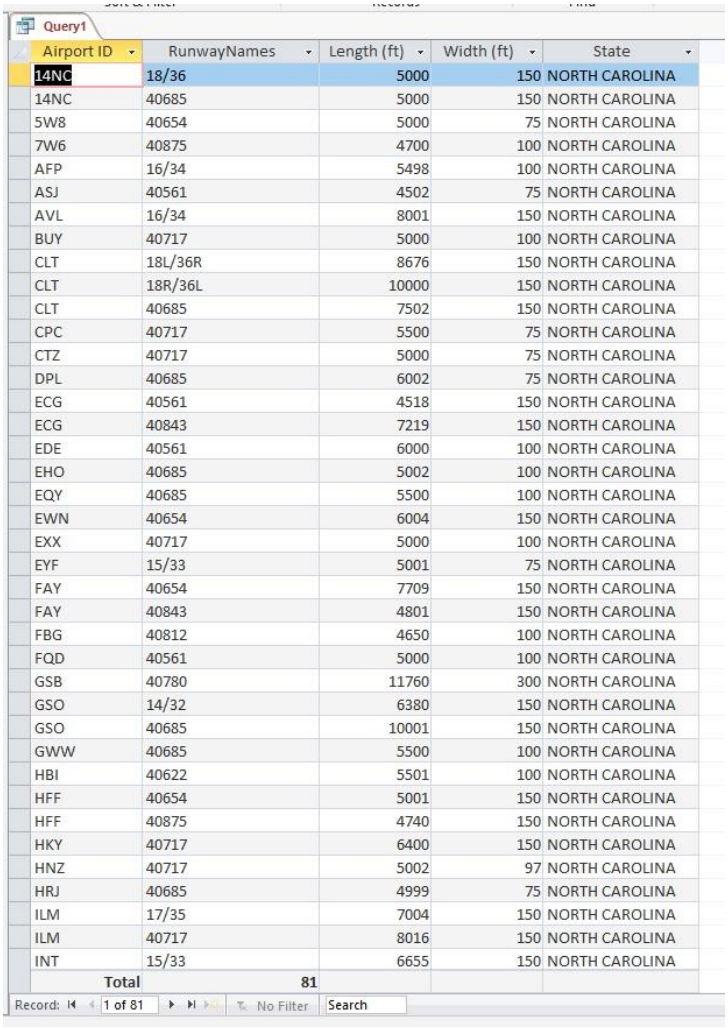
Problem 2:

Task 1:



Task 2:



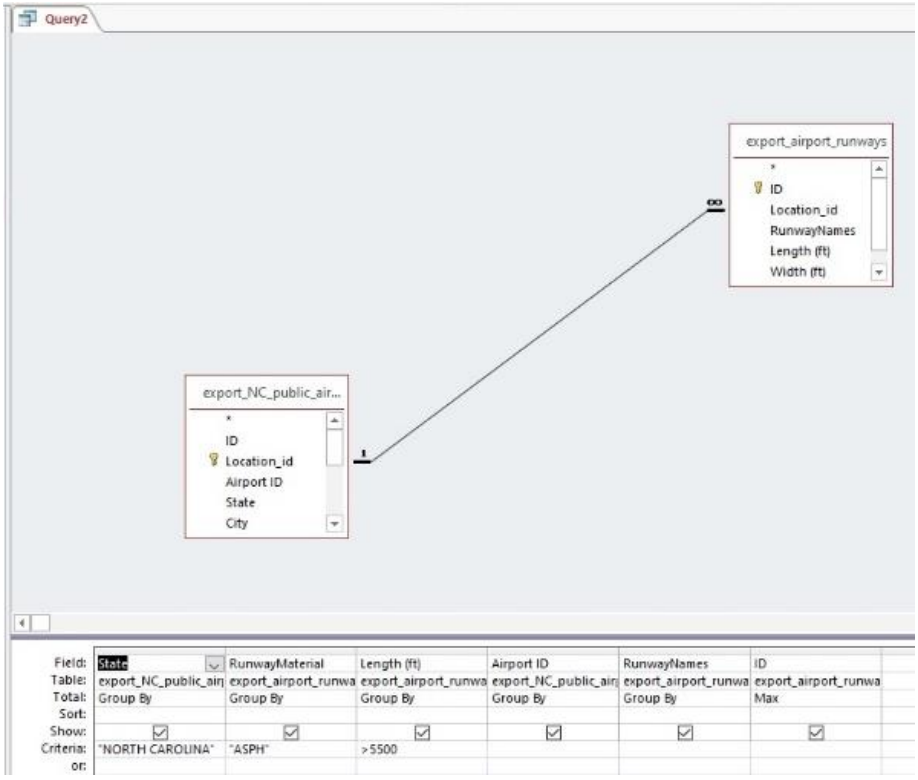


Query1

Airport ID	RunwayNames	Length (ft)	Width (ft)	State
14NC	18/36	5000	150	NORTH CAROLINA
14NC	40685	5000	150	NORTH CAROLINA
5W8	40654	5000	75	NORTH CAROLINA
7W6	40875	4700	100	NORTH CAROLINA
AFP	16/34	5498	100	NORTH CAROLINA
ASJ	40561	4502	75	NORTH CAROLINA
AVL	16/34	8001	150	NORTH CAROLINA
BUY	40717	5000	100	NORTH CAROLINA
CLT	18L/36R	8676	150	NORTH CAROLINA
CLT	18R/36L	10000	150	NORTH CAROLINA
CLT	40685	7502	150	NORTH CAROLINA
CPC	40717	5500	75	NORTH CAROLINA
CTZ	40717	5000	75	NORTH CAROLINA
DPL	40685	6002	75	NORTH CAROLINA
ECG	40561	4518	150	NORTH CAROLINA
ECG	40843	7219	150	NORTH CAROLINA
EDE	40561	6000	100	NORTH CAROLINA
EHO	40685	5002	100	NORTH CAROLINA
EQY	40685	5500	100	NORTH CAROLINA
EWN	40654	6004	150	NORTH CAROLINA
EXX	40717	5000	100	NORTH CAROLINA
EYF	15/33	5001	75	NORTH CAROLINA
FAY	40654	7709	150	NORTH CAROLINA
FAY	40843	4801	150	NORTH CAROLINA
FBG	40812	4650	100	NORTH CAROLINA
FQD	40561	5000	100	NORTH CAROLINA
GSB	40780	11760	300	NORTH CAROLINA
GSO	14/32	6380	150	NORTH CAROLINA
GSO	40685	10001	150	NORTH CAROLINA
GWW	40685	5500	100	NORTH CAROLINA
HBI	40622	5501	100	NORTH CAROLINA
HFF	40654	5001	150	NORTH CAROLINA
HFF	40875	4740	150	NORTH CAROLINA
HKY	40717	6400	150	NORTH CAROLINA
HNZ	40717	5002	97	NORTH CAROLINA
HRJ	40685	4999	75	NORTH CAROLINA
ILM	17/35	7004	150	NORTH CAROLINA
ILM	40717	8016	150	NORTH CAROLINA
INT	15/33	6655	150	NORTH CAROLINA
Total	81			

Record: 1 of 81 No Filter Search

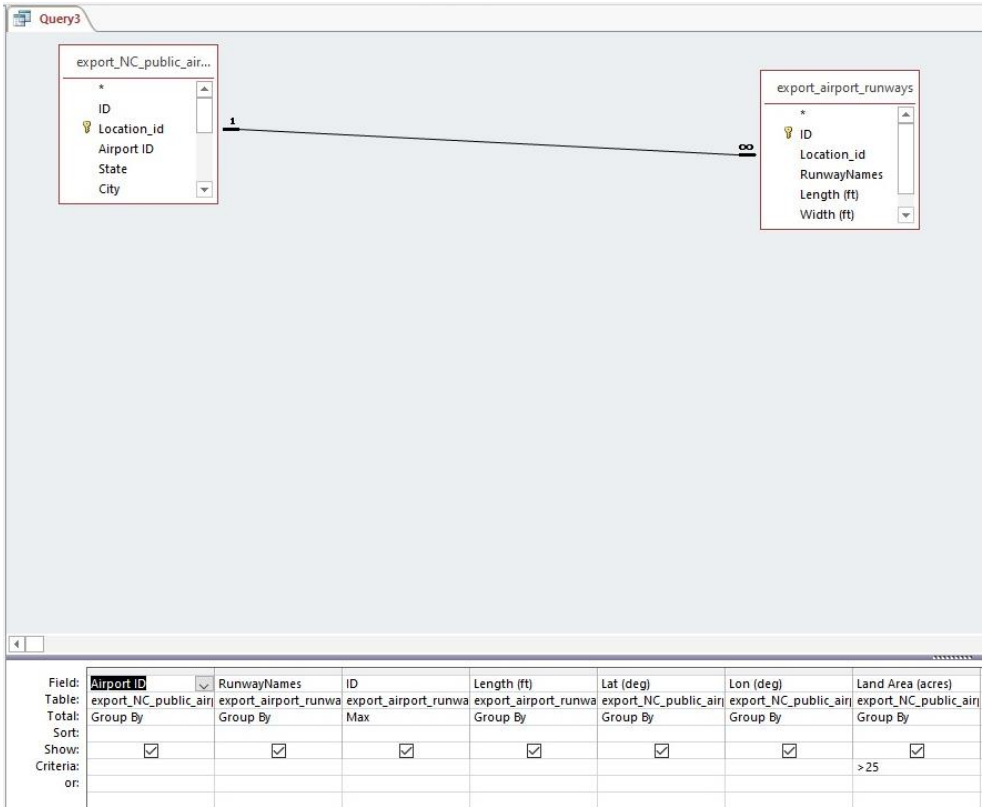
Task 3:



Query2

State	RunwayMaterial	Length (ft)	Airport ID	RunwayNames
NORTH CAROLI	ASPH	5815	NC12	40780
NORTH CAROLI	ASPH	7553	NKT	05L/23R
NORTH CAROLI	ASPH	8188	NKT	05R/23L
NORTH CAROLI	ASPH	8399	NKT	14R/32L
NORTH CAROLI	ASPH	8984	NKT	14L/32R
Total	5			

Task 4:



Query3

Airport ID	RunwayName	Length (ft)	Lat (deg)	Lon (deg)	Land Area (a
00NC	40685	2650	36.09	78.37	30
01NC	18/36	2000	34.48	77.58	100
01NC	40622	3200	34.48	77.58	100
09NC	16/34	2400	35.33	79.03	142
0A7	15/33	3075	35.31	82.43	33
14A	14/32	3147	35.61	80.90	40
15NC	14/32	1800	36.24	76.97	40
1A5	40748	4400	35.22	83.42	90
1NC0	16/34	2300	35.72	79.94	100
1NC2	18/36	1700	35.65	80.79	40
24A	15/33	3003	35.32	83.21	147
28NC	B1	1000	35.96	79.82	60
29NC	40748	1843	35.31	81.63	46
2A5	40593	3800	35.91	79.62	50
2GC	17/35	3500	34.89	78.84	28
2NC4	40561	1350	35.34	78.15	55
2NC6	18/36	1780	35.80	80.40	50
2NC7	18/36	3000	36.17	77.40	32
31A	02W/20W	2000	35.99	80.51	70
31A	40593	2424	35.99	80.51	70
3A4	17/35	3063	35.94	79.69	70
3NC5	18/36	2000	35.81	81.07	35
42NC	17/35	1200	35.96	78.17	150
43A	40622	4001	35.39	79.79	65
43NC	40561	3000	36.02	80.52	50
46NC	40812	1500	34.89	80.37	72
4NC1	H1	100	36.53	79.30	30
57NC	40843	2265	35.43	83.46	30
59NC	40717	2200	36.10	79.56	150
5NC2	18/36	1700	34.88	80.62	70
5NC3	13/31	2538	35.34	79.44	30
5W4	40654	3402	35.02	79.19	51
5W5	16/34	3004	35.62	78.70	50
5W8	40654	5000	35.70	79.50	92
64NC	40561	1800	35.90	79.77	60
6NC1	40622	3000	35.59	81.08	60
71NC	40654	3000	36.26	79.45	100
71NC	40812	1000	36.26	79.45	100
78A	40593	1650	36.20	80.87	35
Total		171			

Record: 1 of 171 | No Filter | Search