

Code & Output

Code:

Tableau

No code

Python

```
# Julia Cuellar
# DSC 640
# Blog

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import math

# Will use in Blog
def read_file():
    air = pd.read_csv('air-safety.csv')
    print('Data:\n', air)
    # plt.hist(air)
    # plt.title('Histogram of Air')
    # plt.show()

def read_file2():
    plane = pd.read_csv('Airplane_Crashes_and_Fatalities_Since_1908.csv')
    print("Display data with null:\n", plane.isnull())
    print("Display counts of null from data:\n", plane.isnull().sum())
    print('Data:\n', plane)

# Will use in Blog
def read_file3():
    fin = pd.read_csv('Financial_Results__1947-Present_Full_Data_data.csv')
    print("Display data with null:\n", fin.isnull())
    print("Display counts of null from data:\n", fin.isnull().sum())
    print('Data:\n', fin)
    pax = fin['Pax (mils)']
    plt.hist(pax, color='orange')
    plt.title('Airline PAX', font='Viner Hand ITC', fontsize=15)
    plt.xlabel('PAX in millions')
    plt.legend(['PAX (mils)'])
    plt.grid()
    plt.show()

def read_file4():
    ffin = pd.read_csv('Financials_Full_Data_data.csv')
    print("Display data with null:\n", ffin.isnull())
    print("Display counts of null from data:\n", ffin.isnull().sum())
    print('Data:\n', ffin)
```

```

# Will use in Blog
def read_file5():
    traffic = pd.read_csv('Traffic & Capacity_Full_Data_data.csv')
    print("Display data with null:\n", traffic.isnull())
    print("Display counts of null from data:\n", traffic.isnull().sum())
    print('Data:\n', traffic)
    x = traffic['Year']
    y = traffic['Load Factor']
    grid_size = 1
    h = 10
    x_min = min(x)
    x_max = max(x)
    y_min = min(y)
    y_max = max(y)
    x_grid = np.arange(x_min - h, x_max + h, grid_size)
    y_grid = np.arange(y_min - h, y_max + h, grid_size)
    x_mesh, y_mesh = np.meshgrid(x_grid, y_grid)
    xc = x_mesh + (grid_size / 2)
    yc = y_mesh + (grid_size / 2)

    def kde_quartic(d, h):
        dn = d / h
        P = (15 / 16) * (1 - dn ** 2) ** 2

        return P

    intensity_list = []

    for j in range(len(xc)):
        intensity_row = []

        for k in range(len(xc[0])):
            kde_value_list = []

            for i in range(len(x)):
                d = math.sqrt((xc[j][k] - x[i]) ** 2 + (yc[j][k] - y[i]) **
2)

                if d <= h:
                    p = kde_quartic(d, h)
                else:
                    p = 0
                kde_value_list.append(p)
            p_total = sum(kde_value_list)
            intensity_row.append(p_total)
        intensity_list.append(intensity_row)

    intensity = np.array(intensity_list)
    plt.pcolormesh(x_mesh, y_mesh, intensity)
    plt.plot(x, y, 'ro')
    plt.colorbar()
    plt.title('Airline Load Factor', font='Viner Hand ITC', fontsize=15)
    plt.xlabel('Year')
    plt.ylabel('Load Factor')
    plt.show()

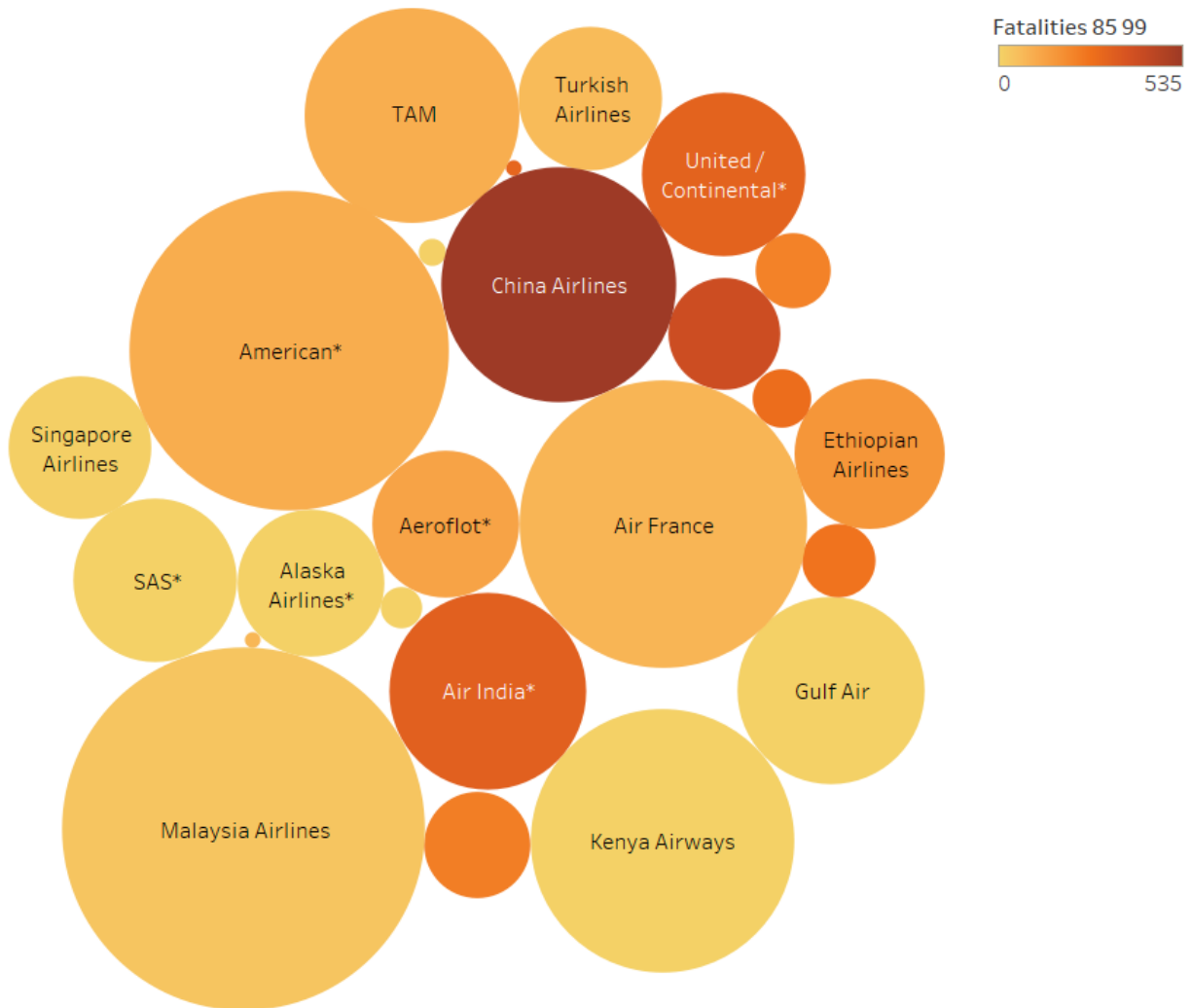
```

```
if __name__ == "__main__":  
    read_file()  
    read_file2()  
    read_file3()  
    read_file4()  
    read_file5()
```

Output:

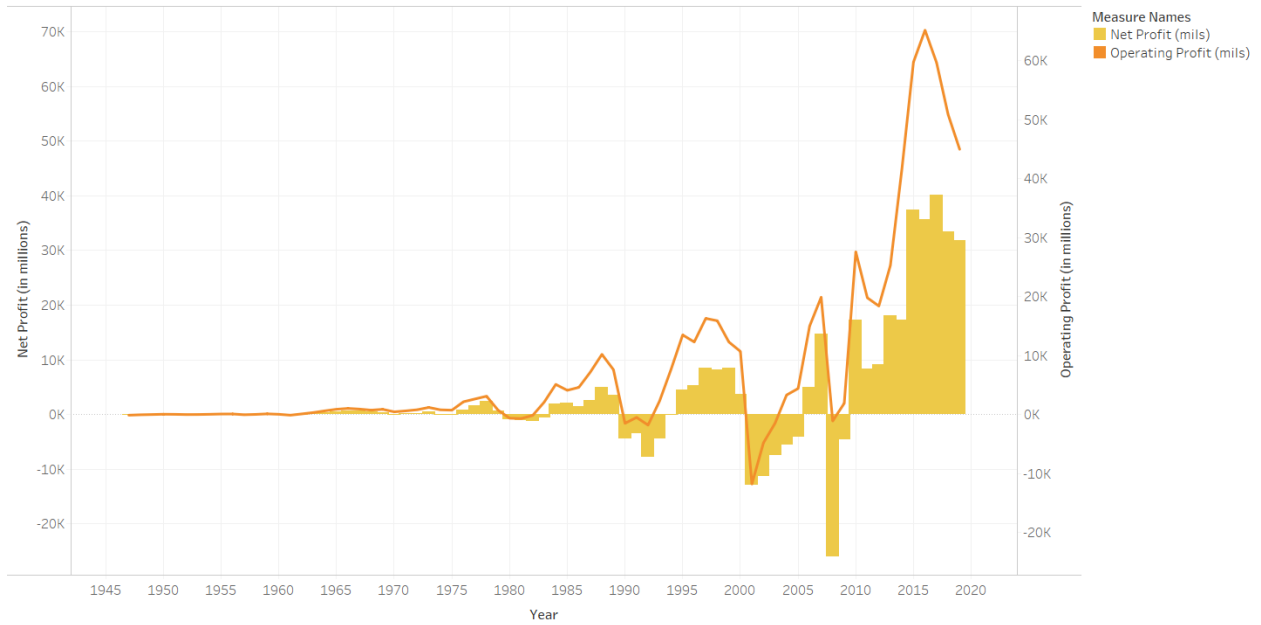
Tableau

Airline Fatalities



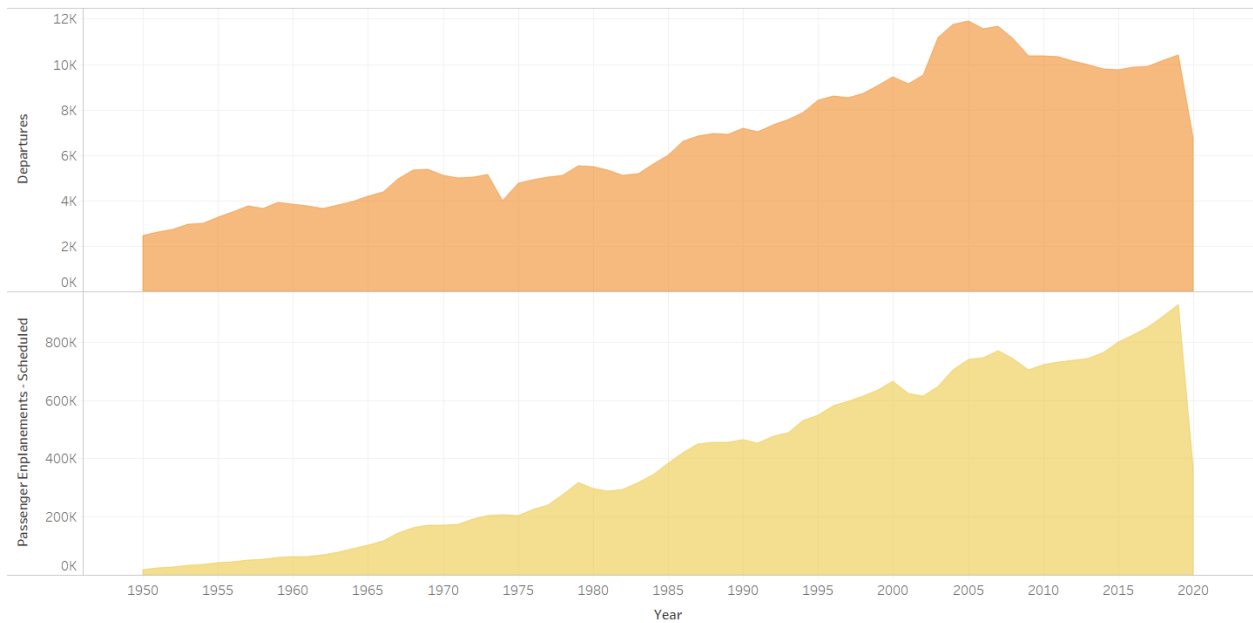
Airline. Color shows sum of Fatalities 85 99. Size shows sum of Fatalities 00 14. The marks are labeled by Airline.

Airline Profit



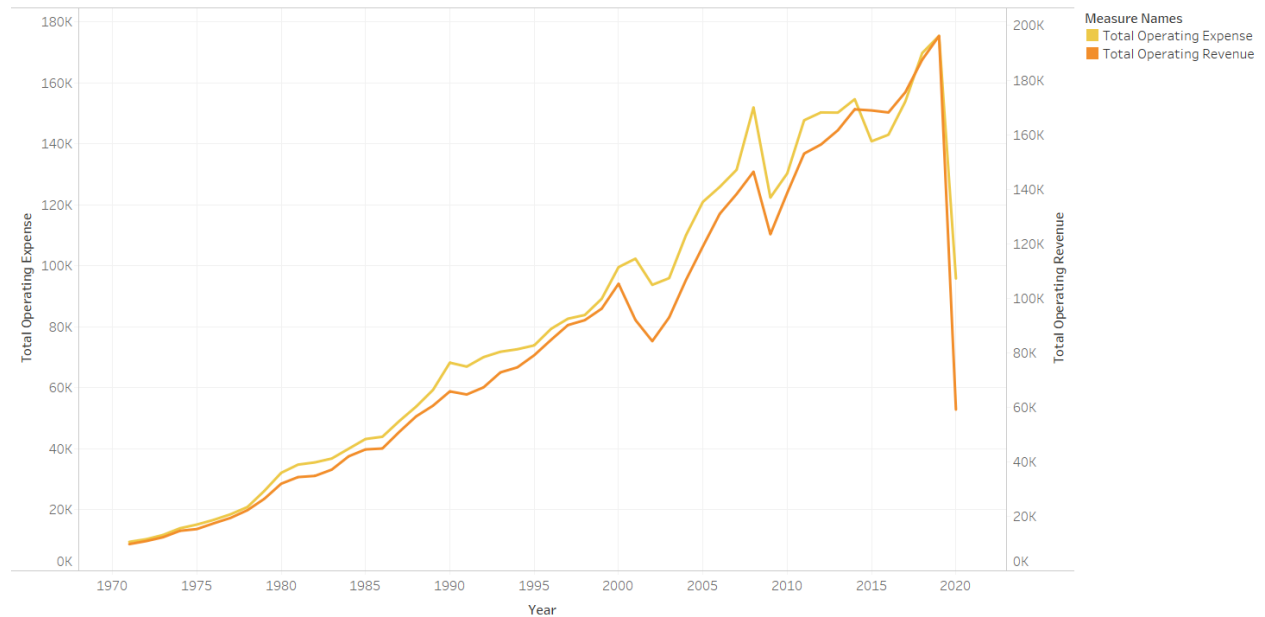
The trends of Net Profit (mils) and Operating Profit (mils) for Year. Color shows details about Net Profit (mils) and Operating Profit (mils).

Airline Departures & Passenger Enplanements



The plots of sum of Departures (000) and sum of Passenger Enplanements (000) - Scheduled for Year.

Total Operating Expense & Revenue



The trends of Total Operating Expense and Total Operating Revenue for Year. Color shows details about Total Operating Expense and Total Operating Revenue. The view is filtered on sum of Total Operating Expense, which keeps non-Null values only.

Python

Data:

	airline ...	fatalities_00_14
0	Aer Lingus ...	0
1	Aeroflot* ...	88
2	Aerolineas Argentinas ...	0
3	Aeromexico* ...	0
4	Air Canada ...	0
5	Air France ...	337
6	Air India* ...	158
7	Air New Zealand* ...	7
8	Alaska Airlines* ...	88
9	Alitalia ...	0
10	All Nippon Airways ...	0
11	American* ...	416
12	Austrian Airlines ...	0

13	Avianca ...	0
14	British Airways* ...	0
15	Cathay Pacific* ...	0
16	China Airlines ...	225
17	Condor ...	0
18	COPA ...	0
19	Delta / Northwest* ...	51
20	Egyptair ...	14
21	El Al ...	0
22	Ethiopian Airlines ...	92
23	Finnair ...	0
24	Garuda Indonesia ...	22
25	Gulf Air ...	143
26	Hawaiian Airlines ...	0
27	Iberia ...	0
28	Japan Airlines ...	0
29	Kenya Airways ...	283
30	KLM* ...	0
31	Korean Air ...	0
32	LAN Airlines ...	0
33	Lufthansa* ...	0
34	Malaysia Airlines ...	537
35	Pakistan International ...	46
36	Philippine Airlines ...	1
37	Qantas* ...	0
38	Royal Air Maroc ...	0
39	SAS* ...	110
40	Saudi Arabian ...	0

41	Singapore Airlines ...	83
42	South African ...	0
43	Southwest Airlines ...	0
44	Sri Lankan / AirLanka ...	0
45	SWISS* ...	0
46	TACA ...	3
47	TAM ...	188
48	TAP - Air Portugal ...	0
49	Thai Airways ...	1
50	Turkish Airlines ...	84
51	United / Continental* ...	109
52	US Airways / America West* ...	23
53	Vietnam Airlines ...	0
54	Virgin Atlantic ...	0
55	Xiamen Airlines ...	0

[56 rows x 8 columns]

Display data with null:

	Date	Time	Location	Operator	...	Aboard	Fatalities	Ground	Summary
0	False	False	False	False	...	False	False	False	False
1	False	False	False	False	...	False	False	False	False
2	False	True	False	False	...	False	False	False	False
3	False	False	False	False	...	False	False	False	False
4	False	False	False	False	...	False	False	False	False
...
5263	False	False	False	False	...	False	False	False	False
5264	False	True	False	False	...	False	False	True	False
5265	False	False	False	False	...	False	False	False	False


```
5266 False False False False ... False False False False
5267 False True False False ... False False False False
```

[5268 rows x 13 columns]

Display counts of null from data:

```
Date          0
Time          2219
Location       20
Operator       18
Flight #      4199
Route         1706
Type          27
Registration   335
cn/In         1228
Aboard        22
Fatalities    12
Ground        22
Summary       390
dtype: int64
```

Data:

```
      Date ...      Summary
0  9/17/1908 ...  During a demonstration flight, a U.S. Army fly...
1  7/12/1912 ...  First U.S. dirigible Akron exploded just offsh...
2   8/6/1913 ...  The first fatal airplane accident in Canada oc...
3   9/9/1913 ...  The airship flew into a thunderstorm and encou...
4  10/17/1913 ...  Hydrogen gas which was being vented was sucked...
...      ... ...      ...
5263  5/20/2009 ...  While on approach, the military transport cras...
```

5264 5/26/2009 ... The cargo plane crashed while on approach to I...

5265 6/1/2009 ... The Airbus went missing over the AtlantiOcean ...

5266 6/7/2009 ... The air ambulance crashed into hills while att...

5267 6/8/2009 ... The military transport went missing while en r...

[5268 rows x 13 columns]

Display data with null:

	Year	_Item Type	_Path	...	Pax (mils)	PLF	RPKs (mils)
0	False	False	False	...	False	True	False
1	False	False	False	...	False	True	False
2	False	False	False	...	False	True	False
3	False	False	False	...	False	False	False
4	False	False	False	...	False	False	False
..
68	False	False	False	...	False	False	False
69	False	False	False	...	False	False	False
70	False	False	False	...	False	False	False
71	False	False	False	...	False	False	False
72	False	False	False	...	False	False	False

[73 rows x 19 columns]

Display counts of null from data:

Year	0
_Item Type	0
_Path	0
Title	0
Aircraft Deps (000)	13
Aircraft KMs (mils)	0

ASKs (mils)	3
Cargo RTKs (mils)	0
Freight RTKs (mils)	0
Freight Tonnes (mils)	22
Mail RTKs (mils)	0
NetMargin	0
NetProfit (mils)	0
Number of Records	0
OpProfit (mils)	0
OpRevenues (mils)	0
Pax (mils)	0
PLF	3
RPKs (mils)	0

dtype: int64

Data:

	Year	_Item	Type	...	PLF	RPKs (mils)
0	1947	Item	...	NaN	1.900000e+04	
1	1948	Item	...	NaN	2.100000e+04	
2	1949	Item	...	NaN	2.400000e+04	
3	1950	Item	...	0.608696	2.800000e+04	
4	1951	Item	...	0.636364	3.500000e+04	
..	
68	2015	Item	...	0.802386	6.652791e+06	
69	2016	Item	...	0.802855	7.144498e+06	
70	2017	Item	...	0.814775	7.716542e+06	
71	2018	Item	...	0.817701	8.278782e+06	
72	2019	Item	...	0.823993	8.685667e+06	

[73 rows x 19 columns]

Display data with null:

	Year	Aircraft Ownership	...	Total Operating Revenue	Transport-Related
0	False	False	...	False	False
1	False	False	...	False	False
2	False	False	...	False	False
3	False	False	...	False	False
4	False	False	...	False	False
5	False	False	...	False	False
6	False	False	...	False	False
7	False	False	...	False	False
8	False	False	...	False	False
9	False	False	...	False	False
10	False	False	...	False	False
11	False	False	...	False	False
12	False	False	...	False	False
13	False	False	...	False	False
14	False	False	...	False	False
15	False	False	...	False	False
16	False	False	...	False	False
17	False	False	...	False	False
18	False	False	...	False	False
19	False	False	...	False	False
20	False	False	...	False	False
21	False	False	...	False	False
22	False	False	...	False	False
23	False	False	...	False	False
24	False	False	...	False	False

25	False	False ...	False	False
26	False	False ...	False	False
27	False	False ...	False	False
28	False	False ...	False	False
29	False	False ...	False	False
30	False	False ...	False	False
31	False	False ...	False	False
32	False	False ...	False	False
33	False	False ...	False	False
34	False	False ...	False	False
35	False	False ...	False	False
36	False	False ...	False	False
37	False	False ...	False	False
38	False	False ...	False	False
39	False	False ...	False	False
40	False	False ...	False	False
41	False	False ...	False	False
42	False	False ...	False	False

[43 rows x 19 columns]

Display counts of null from data:

Year	0
Aircraft Ownership	0
Airport Rents and Fees	0
Cargo RTMs (mil)	0
Departures (000)	0
Fuel Expense	0
Labor Expense	0

Load Factor	0
Net Profit	0
Operating Profit	0
Other Expense	0
Other Expense*	0
Passenger Enplanements (000) - Scheduled	0
Pre-Tax Profit	0
Scheduled ASMs (000)	0
Scheduled RPMs (000)	0
Total Operating Expense	0
Total Operating Revenue	0
Transport-Related	0

dtype: int64

Data:

	Year	Aircraft Ownership ...	Total Operating Revenue	Transport-Related
0	1977	1309.986787 ...	19423.189822	444.721644
1	1978	1300.781563 ...	22244.524955	624.912835
2	1979	1399.176618 ...	26411.246006	624.608911
3	1980	1585.431658 ...	31950.494785	681.886651
4	1981	1706.651661 ...	34390.155130	661.857945
5	1982	1904.429109 ...	34819.529349	676.592429
6	1983	2116.988966 ...	37124.284829	745.055554
7	1984	2413.753214 ...	41998.424794	815.990696
8	1985	2786.120746 ...	44537.198193	891.357307
9	1986	3123.037292 ...	44867.074694	891.964231
10	1987	3536.982041 ...	50957.331942	1094.115349
11	1988	4130.832209 ...	56657.281188	1208.239793
12	1989	4639.063966 ...	60577.084691	1283.104717

13	1990	5407.866273 ...	65817.160180	1399.739016
14	1991	5714.750355 ...	64687.719272	1215.166491
15	1992	6255.759329 ...	67307.909583	1123.971481
16	1993	6585.691600 ...	72801.484125	1193.327554
17	1994	6883.721606 ...	74632.276964	1441.888811
18	1995	7087.987269 ...	79081.478638	1609.829691
19	1996	7686.799645 ...	84733.354615	1973.612027
20	1997	7543.407241 ...	90142.867217	2297.589953
21	1998	7836.391168 ...	91949.406798	2400.591763
22	1999	8666.676286 ...	96163.206985	2712.254698
23	2000	9620.986817 ...	105310.768099	3303.480147
24	2001	9756.205466 ...	92011.562431	3809.540147
25	2002	9625.034475 ...	84254.838096	4010.829153
26	2003	9638.787055 ...	92949.783354	7803.975598
27	2004	10152.149541 ...	106734.055168	13211.553209
28	2005	9882.208514 ...	119010.006048	16297.738793
29	2006	9582.559609 ...	130961.304939	17470.493839
30	2007	9294.450927 ...	138221.429247	17942.646243
31	2008	8977.311286 ...	146392.299174	20997.289352
32	2009	8920.487208 ...	123455.192484	17135.976352
33	2010	9004.872272 ...	138641.575267	17708.751814
34	2011	9074.711307 ...	153049.358928	20806.862381
35	2012	8982.599188 ...	156373.972558	20289.316813
36	2013	9405.997205 ...	161595.499584	20960.615347
37	2014	9602.753571 ...	169276.541196	20710.983703
38	2015	9942.298549 ...	168874.498994	18172.544284
39	2016	10715.168612 ...	168129.458305	17956.503295
40	2017	10880.833845 ...	175552.931352	19009.023852

41	2018	11321.146435 ...	187473.715422	21492.551810
42	2019	11857.440156 ...	196214.618159	22462.580380

[43 rows x 19 columns]

Display data with null:

	Year	Aircraft Ownership	...	Total Operating Revenue	Transport-Related
0	False	True	...	True	True
1	False	True	...	True	True
2	False	True	...	True	True
3	False	True	...	True	True
4	False	True	...	True	True
..
66	False	False	...	False	False
67	False	False	...	False	False
68	False	False	...	False	False
69	False	False	...	False	False
70	False	False	...	False	False

[71 rows x 19 columns]

Display counts of null from data:

Year	0
Aircraft Ownership	21
Airport Rents and Fees	21
Cargo RTMs (mil)	0
Departures (000)	0
Fuel Expense	21
Labor Expense	21
Load Factor	0

Net Profit	21
Operating Profit	21
Other Expense	21
Other Expense*	21
Passenger Enplanements (000) - Scheduled	0
Pre-Tax Profit	21
Scheduled ASMs (000)	0
Scheduled RPMs (000)	0
Total Operating Expense	21
Total Operating Revenue	21
Transport-Related	21

dtype: int64

Data:

	Year	Aircraft Ownership	...	Total Operating Revenue	Transport-Related
0	1950	NaN	...	NaN	NaN
1	1951	NaN	...	NaN	NaN
2	1952	NaN	...	NaN	NaN
3	1953	NaN	...	NaN	NaN
4	1954	NaN	...	NaN	NaN
..
66	2016	10715.168612	...	168129.458305	17956.503295
67	2017	10880.833845	...	175552.931352	19009.023852
68	2018	11321.146435	...	187473.715422	21492.551810
69	2019	11857.440156	...	196214.618159	22462.580380
70	2020	8733.928387	...	59145.917938	10944.502949

[71 rows x 19 columns]

